NATIONAL FIRE ACADEMY

FEMA

EMERGENCY RESPONSE TO TERRORISM: BASIC CONCEPTS

STUDENT MANUAL

1st Edition, 1st Printing
August 1997
ERT:BC (F531)

UNITED STATES FIRE ADMINISTRATION
In cooperation with the U.S. Department of Justice
Office of Justice Programs - Bureau of Justice Assistance

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FEDERAL EMERGENCY MANAGEMENT AGENCY

UNITED STATES FIRE ADMINISTRATION

NATIONAL FIRE ACADEMY

FOREWORD

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

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

To achieve the Academy's legislated mandate (under Public Law 93-498, October 29, 1974), "to advance the professional development of fire service personnel and other persons engaged in fire prevention and control activities," the National Fire Academy has developed an effective program linkage with established fire training systems which exist at the state and local levels. Academy field courses have been sponsored by the respective state fire training systems in every state.

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

This course addresses the special needs of responders to incidents which may have been caused by terrorist action. The response to terrorism program builds upon the firm foundation provided by the Hazardous Materials curriculum offered at the Academy and adds specialized information concerning such topics as:

- current Department of Justice definitions of terrorism;
- a history of terrorism;
- agents utilized by terrorists;
- suspicious circumstances;
- self-protection at potential terrorist scenes;
- crime scene considerations; and
- specialized incident command issues.

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MODULE 0:
WELCOME AND INTRODUCTIONS

WELCOME

Welcome to the National Fire Academy's course Emergency Response to Terrorism: Basic Concepts. During the next two days you will explore a wide variety of issues and concerns faced by responders when operating at a potential terrorism incident.

From the smallest pipe bomb to the horror of the Oklahoma City bombing, terrorism presents added concerns to those involved in emergency response. This course addresses the special requirements of those incidents with a special emphasis on self protection for first responders.

Biological **N**uclear **I**ncendiary **C**hemical **E**xplosives

Terrorist incidents involving biological, nuclear, incendiary, chemical, or explosive (**B-NICE**) materials are considered technological hazardous incidents by nature. For this reason, this course is approached from the point of view of a hazardous materials incident with additional complicating factors. This allows us to build upon the proven structure of hazardous materials response in order to address terrorist incidents.

COURSE GOALS

At the completion of this course, you will be able to:

1. Define and discuss terrorism including identifying significant incidents that have occurred within the United States.
2. Recognize circumstances and on-scene key indicators which may signify a suspicious incident.
3. Implement appropriate self-protective measures.
4. Define scene security considerations unique to terrorist incidents.
5. Make appropriate notifications.
6. Define and describe defensive considerations associated with biological, nuclear, incendiary, chemical, and explosives (B-NICE) incidents.
7. Describe command and control issues associated with crime scene activities.
8. Define and describe recovery and termination issues associated with terrorism incidents.

TARGET AUDIENCES

This course is primarily designed to address the needs of fire service personnel, emergency medical services providers, and hazardous materials responders, all trained to at least the operations level of hazardous materials response. Due to the broad scope of the subject matter, the course can be used to address the needs of those without prior hazardous materials training and provide benefits to law enforcement personnel, emergency communications personnel, emergency management personnel, public works management, public health workers, armed forces, and disaster response agencies.

COURSE STRUCTURE

The body of this course is organized into five modules:

Module 1: **Understanding and Recognizing Terrorism** will help the responder recognize suspicious circumstances in advance.

Module 2: **Implementing Self-Protective Measures** assists the student in utilizing time, distance and shielding to protect themselves from dangerous exposure.

Module 3: **Scene Security** defines isolation, evacuation and control issues unique to terrorism incidents.

Module 4: **Tactical Considerations** covers specific defensive measure utilized in each major category (B-NICE) of incident.

Module 5: **Incident Command Overview** gives a broad picture of:

- local, State, and Federal resources;
- making appropriate notifications;
- specialized crime scene considerations; and
- operating in a multi-jurisdictional command system under the Federal Response Plan (FRP).

Individual and small group activities will be scattered throughout the course. At the end of the course there will be a comprehensive activity and a final exam.

ADDITIONAL RESOURCES:

Your Student Manual is designed to serve as a reference after you leave the class, and for that purpose includes additional materials beyond that presented in class. The manual includes a selection of appendicies, as well as a glossary and bibliography. The appendicies include:

Appendix A: Security Awareness Bulletin articles
Appendix B: Presidential Decision Directive 39 abstract (unclassified)
Appendix C: The Federal Response Plan (FRP) Overview
Appendix D: The Terrorism Annex to the FRP
Appendix E: The FBI Chemical/Biological Incident Contingency Plan (unclassified)
Appendix F: MSDS's for Chemical Warfare Materials
Appendix G: Supplemental Information on Biological Agents
Appendix H: Supplemental Information on Self-Protection

MODULE 1:
UNDERSTANDING AND RECOGNIZING TERRORISM

TERMINAL OBJECTIVE

The students will be able to recognize circumstances that indicate a potential terrorist act.

ENABLING OBJECTIVES

The students will:

1. *Define domestic and international terrorism per the current Department of Justice definition.*

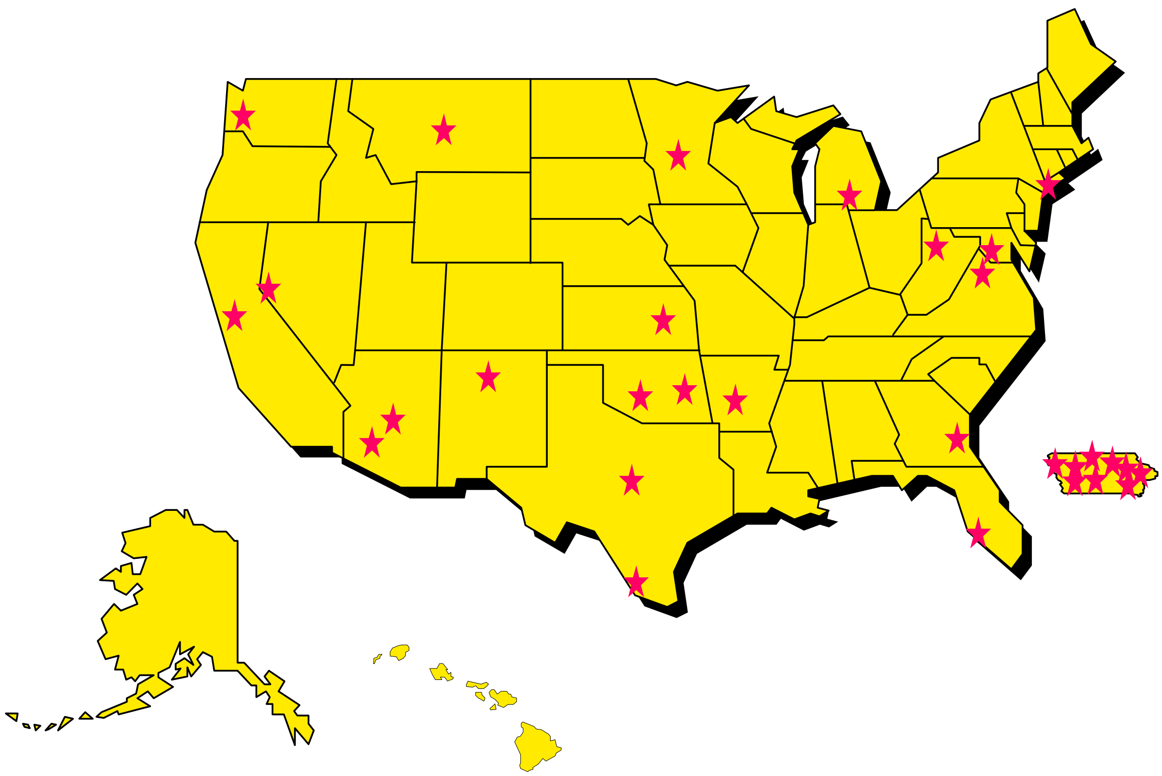
2. *Illustrate, through case histories, various types of potential incidents.*

3. *Define differences and similarities between responding to terrorist and non-terrorist incidents.*

4. *Recognize suspicious circumstances which may indicate possible terrorism.*

INTRODUCTION

The threat of terrorism affects all communities both nationally and internationally. History has shown that no community is immune. Terrorism transcends all geographic and demographic boundaries. All jurisdictions, suburban, urban and rural are at risk. Terrorists, both international and "home grown," have demonstrated they have the knowledge and capability to strike anywhere in the world. While not all the incidents we cite here have been determined to be terrorism, they are all suspicious criminal acts which may be linked to terrorist activity.



A Sampling of Suspicious Incidents in Recent History

Eastern USA (East of the Mississippi River).

- In February 1993, the World Trade Center was damaged by a vehicle bomb, killing 6 people.
- In July 1993, a member of the Animal Liberation Front set a fire in a Michigan State University research facility.
- In April 1996, members of the Georgia Militia were arrested for plotting to make dozens of pipe bombs.
- In October 1996, seven men with connections to a local anti-government paramilitary group were arrested on charges of plotting to blow up the Criminal Justice Information Services complex near Clarksburg, WV.

- In 1995, a Harrisonburg, VA neurologist was charged with possession of ricin with intent to use it to kill his former boss.
- In September 1996, a Staten Island, NY man accused of stockpiling weapons was arrested by ATF agents.
- In 1996, a Romanian immigrant was stopped as he attempted to board a flight in Tampa, FL carrying five explosive devices, weapons, and 180 rounds of ammunition.
- In January 1997, several letter bombs were sent to the offices of the Al Hayat Publishing Company offices in the National Press Building in Washington, DC.
- In 1996 and 1997, numerous bombing incidents occurred in the Atlanta area including at least two with confirmed secondary devices.

Central USA.

- In April 1995, the Alfred P. Murrah Federal Building in Oklahoma City was bombed. 168 people were killed and hundreds injured.
- In March 1995, members of the Patriot's Council in central Minnesota were arrested and charged with manufacturing ricin to kill law enforcement officers.
- In November 1995, charges were filed against an "anti-government prophet" in Muskogee, OK, for plotting a series of bombings against abortion clinics, civil rights offices and government facilities.
- In May 1996, an explosion blew out the windows in a building housing an FBI field office in Laredo, TX.
- In August 1996, a person was sentenced for plotting to bomb the office of the IRS in Austin, TX.
- In December 1995, a man charged with possession of ricin in Arkansas killed himself in his jail cell.
- Also in 1996, a man identified as a member of an anti-government freeman group was apprehended in Topeka, KS, and authorities found a bomb-triggering device in his car.

Western USA.

- In October 1995, the Amtrak Sunset Limited was derailed by sabotaged tracks near Hyder, AZ. This incident killed one and seriously injured 12.
- In December 1995, there was an attempted bombing of the IRS building in Reno, NV.
- In January 1996, an explosion took place outside of a U.S. Forest Service headquarters in Espanola, NM.
- In April 1996, a bomb exploded in the truck of a federal employee, injuring him and his wife in Vacaville, CA.
- In April 1996, Theodore Kaczynski was arrested as the suspected Unibomber.
- In June 1996, members of the Viper Militia were arrested in Phoenix, Arizona and charged with conspiracy to make bombs and use deadly weapons.
- In June 1996, members of the Washington State Militia and a Seattle-based Freeman group were arrested on federal conspiracy charges.

Most of these items were taken from either Terrorism in the United States 1995 published by the FBI or Security Awareness Bulletin, number 3-96, published by the Department of Defense Security Institute, Richmond, VA. Several articles, including the one from which much of this material was obtained, are in Appendix A of your Student Manual.

In addition to the above, according to materials provided on the FEMA Internet site, attacks in Puerto Rico accounted for about 60 percent of all terrorist incidents between 1983 and 1991 that occurred on United States territory.

DEFINING TERRORISM

The general definition of terrorism is as follows:

Terrorism — A violent act or an act dangerous to human life, in violation of the criminal laws of the United States or any segment to intimidate or coerce a government, the civilian population or any segment thereof, in furtherance of political or social objectives (US Department of Justice).

The Federal Bureau of Investigation further defines two types of terrorism that occur in the United States.

Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction.

International terrorism involves groups or individuals whose terrorist activities are foreign-based and/or directed by countries or groups outside the United States or whose activities transcend national boundaries.

We indicated earlier that incidents involving B-NICE agents are considered technological hazardous incidents. This is a broad field that includes hazmat as one subtopic. Criminal incidents also comprise a broad field. Where those two types of incidents overlap, we find a select group of incidents including arson, environmental crime, industrial sabotage, non-terrorist bombings, weapons of mass destruction, and, of course, B-NICE terrorism.

While the Department of Justice uses a very narrow definition of terrorism, the concerns of public safety responders go well beyond that limited scope. In this program we will study terrorism, bombings and weapons of mass destruction described as Biological, Nuclear, Incendiary, Chemical, and Explosive (B-NICE) incidents. However, criminals that resort to weapons of mass destruction regardless of their motive will not be restricted by any definition or category. We need to be concerned with the broader field of criminal incidents that offer a variety of threats to public safety and responders alike.

Bombings include a wide variety of incidents not related to terrorism. The following information is taken from the FBI Bomb Data Statistics page. The Internet address for this site is in your bibliography:

To request additional information or for inclusion on the EU-BDC mailing list, send a fax at (202) 324-3784 or mail your request to:

Federal Bureau of Investigation
Laboratory Division Explosives Unit-Bomb Data Center
J. Edgar Hoover Building, Room 3918
935 Pennsylvania Avenue, NW
Washington, DC 20535-0001

1990 ----------- Criminal Bombing Incidents ----------- 1995

	1990	1991	1992	1993	1994	1995
TOTAL	**1,582**	**2,499**	**2,989**	**2,980**	**3,163**	**2,577**
Actual Explosive	931	1,551	1,911	1,880	1,916	1,562
Attempted Explosive	254	395	384	375	522	417
Actual Incendiary	267	423	582	538	545	406
Attempted Incendiary	130	130	112	187	180	192

	1990	1991	1992	1993	1994	1995
Damage (in millions)	9.6	6.4	12.5	518.0	7.5	105.1
Persons Injured	222	230	349	1,323	308	744
Persons Killed	27	29	26	49	31	193

A SHORT HISTORY OF TERRORISM

Terrorism has been with humanity ever since societies started having arguments. Infected corpses were used long before the germ theory of disease. Biological toxins extracted from plants were used to poison wells and assassinate leaders as far back as any history can trace. Here are some examples of terrorism over the past 300 years.

18th century:

- Infected corpses were used by the Russians against areas held by Sweden;
- The Puritans performed many acts of violence against other religious groups, especially the Catholics and Quakers prior to and after the Revolutionary War;
- Organized violence against government taxation included Shay's Rebellion (1786) and the Whiskey Rebellion (1791); and
- British officials provided blankets from smallpox patients to Native Americans.

19th Century:

- Planned assassination of Tsar Alexander II;
- 12 additional assassinations of public officeholders took place following that of President Lincoln;
- The Ku Klux Klan began acts of terrorism;
- In 1886, a peaceful labor rally at the Haymarket Square in Chicago was disrupted when an unknown person threw a bomb, killing seven;
- Catholic churches were burned in Boston, Philadelphia and other cities from the 1830s - 1850s; and
- Industrial Workers of the World (IWW) activists use 3,000 pounds of dynamite to blow up the Hill and Sullivan Company mine at Wadner, Idaho, along with a boarding house and bunkhouse.

20th Century:

- The 1950 assassination attempt on President Truman by Puerto Rican nationalists resulted in the death of one DC police officer during a gun battle outside the Blair House;
- In 1954, five members of congress were wounded by gunfire during an attack by Puerto Rican nationalists;
- One of 49 bombing attributed to the Puerto Rican group FALN between 1974 and 1977 was the Frances Tavern bombing in New York City. Four people died in this event;
- In 1975, a bombing by Croatian nationalists killed eleven and injured 75 at LaGuardia Airport in New York City;
- In 1976, Orlando Letelier, a former Chilean ambassador to the United States. was killed along with one of his associates in a car bombing in Washington, DC;
- In 1981, a man was killed when a bomb planted by a group calling itself the Puerto Rican Armed Resistance detonated in a men's bathroom at Kennedy International Airport in New York City;

- In 1983, a bomb detonated in the cloak room next to the U.S. Senate in the Capitol Building. Two left-wing radicals plead guilty to the attack;
- During the latter half of the 20th century there were numerous airline hijackings and bombings;
- The 1993 World Trade Center bombing;
- The 1995 Oklahoma City bombing;
- The 1994 Matsumoto and 1995 Tokyo chemical attacks; and
- Multiple bombings in Atlanta in 1997.

Victims of the Tokyo Subway Incident

As you can see, extremists have used property destruction and violence to generate fear and compel societal change throughout history. However, one major change has happened recently. Prior to modern times, terrorists usually granted certain categories of people (e.g., women, children, clergy, elderly, infirm, etc.) immunity from attack. Like other warriors, terrorists recognized innocents – people not involved in conflict. For example, in late nineteenth-century Russia, radicals planning the assassination of Tsar Alexander II, the leader of Russia, aborted several planned attacks because they risked harming innocent people. Historically terrorism was direct; it intended to produce a political effect through the injury or death of the victim.

The development of bureaucratic states resulted in a philosophical change among terrorist groups. Since modern governments are designed to be more dependent upon processes and structure than unique individuals, the death of a single individual, even a president or prime minister, will not necessarily produce the major disruption terrorists desire. Terrorists have reacted by turning from targeting prominent individuals to attacks aimed at a wider range of targets including those historically considered immune.

Nighttime Operations at Oklahoma City

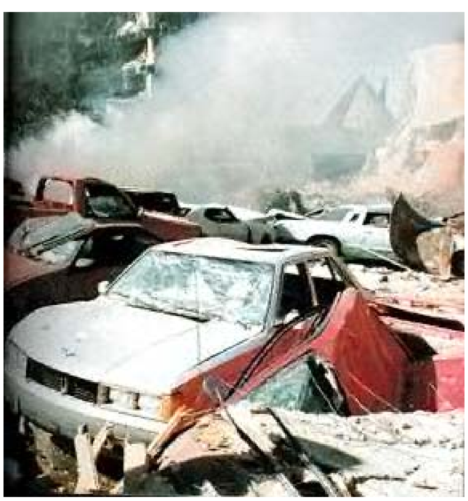
Events such as the World Trade Center and Oklahoma City incidents, and various clinic bombings are designed to create a public atmosphere of anxiety and undermine confidence in government. Their unpredictability and apparent randomness make it virtually impossible for governments to protect all potential victims.

Modern terrorism offers its practitioners many advantages. First, by not recognizing innocents, terrorists have an infinite number of targets. They select their target and determine when, where, and how to attack. The range of choices gives terrorists a high probability of success with minimum risk. If the attack goes wrong or fails to produce the intended results, the terrorists can deny responsibility.

THE EMERGENCY RESPONSE CHALLENGE

The emergency response challenge is profound. On the one hand, you have a hazardous materials or mass casualty incident. From that standpoint, you can and should use recognized protocols such as the Incident Command System (as referenced in 29 CFR 1910.120) in order to effectively respond to the needs of the victims and the public. On the other hand, the scene is compounded by two complicating factors which all responders will have to take into account — deliberate targeting of responders and crime scene considerations.

Preparing Responders for Entry



Automobiles damaged in a bombing

Terrorists have a history of utilizing **secondary devices** and/or booby traps to target emergency responders. In January 1997, a bomb went off outside of an Atlanta abortion clinic. One hour after the initial detonation, a second bomb went off close to the point at which the incident command post had been established. It resulted in several injuries to responders. If parked automobiles had not absorbed some of the blast, several deaths could have occurred.

If the incident is a potential act of terrorism, it is also a crime scene. While there will be similarities between terrorist and non-terrorist events such mass casualty incidents (e.g., major transportation and hazmat accidents), crime scene considerations will add a complicating factor to responder operations. This will be discussed further in modules 3 and 5.


Decontamination Operations

Regardless of the mechanism or motive behind the incident, responders should remain focused on reducing the impact of the event as efficiently and safely as possible. Terrorist or non-terrorist event, all responders should follow established operating guidelines that are pertinent to their respective agency. All responders on the scene should operate under an incident command system (as referenced in 29 CFR 1910.120) and utilize some type of personnel accountability system that is compatible with all participating agencies.

Recognizing suspicious incidents may be difficult, but being extremely alert to clues, surroundings and events will greatly assist in identification. Clues such as occupancy location, type of event, timing of the event and on-scene warning signs will help with this process. Examples of these clues are:

1. Occupancy or location:

Symbolic and historical targets include those which represent some organization or event which is particularly offensive in the minds of extremists. Examples of this might include Bureau of Alcohol, Tobacco and Firearms (BATF) offices for those who oppose all forms of gun control or Internal Revenue Service (IRS) offices for tax resisters.

Public buildings or assembly areas provide the opportunity for attention-getting mass casualties. Some of these public buildings are also symbolic targets, so the terrorist can cause massive casualties and link the owner/operator of the building or assembly area with danger in the minds of the public. Examples of these would include shopping malls, convention centers, entertainment venues, and tourist destinations.

Controversial businesses are usually those which have a history of attracting the enmity of recognized groups which include extremist elements. Abortion clinics, nuclear facilities, and furriers all fall into this category.

Infrastructure systems include those operations which are necessary for the continued functioning of our society. Major cities are full of targets such as power plants, phone companies, water treatment plants, mass transit, and hospitals. Attacks on any of these have the potential to disrupt entire regions and cost hundreds of millions of dollars to correct.

2. Type of event:

Certain types of events should raise your awareness of possible terrorism involvement. In general they can be categorized as follows.

Explosions and/or incendiaries are among the favorite weapons of terrorists. Any bombing or suspicious fire may involve terrorist involvement, especially combined with location or occupancy factors as listed above.

Incidents involving firearms are always treated as suspicious. If they occur in conjunction with other indicating factors, terrorism is a definite possibility.

Non-trauma mass casualty incidents have occurred as the arsenal of terrorism increases in sophistication. When large numbers of victims are generated without obvious (physical) injury, you may suspect terrorist involvement.

3. Timing of the event:

For many years to come, April 19 will be a day around which government facilities operate at heightened state of security awareness. Since it is the anniversary of both the fire at the Branch Davidian compound in Waco, Texas and the bombing of the Alfred P. Murrah building in Oklahoma City, it has become a rallying point for anti-government extremists.

Outside of significant anniversaries, events that occur on specific days of the week and times are worth treating with suspicion. A fire at a government building during the weekend or during a time when few people are likely to be present may also involve terrorism or other criminal activity.

4. On-scene warning signs

When you arrive on the scene, you should always watch for signs that you are dealing with a suspicious incident. Unexplained patterns of illnesses or deaths can be due to chemical, radiological or biological agents. Some of these substances have recognizable odors and/or tastes. Unexplained signs and symptoms of skin, eye, or airway irritation may be due to chemical contamination, as can unexplained vapor clouds, mists and plumes.

Always keep on the lookout for chemical containers, spray devices or lab equipment in unusual locations. Watch for items or containers that appear out of place at unusual incidents, which might indicate a secondary device. When dealing with fires, spot fires and fires of unusual behavior may also arouse your suspicions, as can anything that appears not to be “normal” for a given incident scene.

Activity 1.1

Recognizing Suspicious Incidents

Purpose

This activity is designed to assist you in making quick decisions concerning the possibility of criminal activity at an incident and to justify your decision.

Directions to Students

1. You will have ten minutes to complete the group discussion and return to the class.

2. Meet as a group and discuss the scenario. Determine what outward warning signs and indicators would alert you to the possibility of criminal activity.

3. Also discuss any special challenges that will face the responder as a result of deciding that this incident is possibly due to criminal activity.

4. Record your responses on a flip chart and return to the class.

5. Each group will have five minutes to report their findings to the class. Be prepared to provide a justification for each one of the warning signs or indicators you mention.

Activity 1.1

Recognizing Suspicious Incidents

Scenario A

Friday evening at 6:00 PM, your community receives a call from a local hospital that is undertaking emergency evacuation due to numerous people falling ill for no apparent reason. Symptoms include blurred vision, muscular convulsions, and profound tearing and nasal discharges.

List Outward Warning Signs or Indicators and Justification:

List Special Challenges:

Activity 1.1

Recognizing Suspicious Incidents

Scenario B

You receive a call that a transformer has exploded. Upon arrival at the scene, you find the transformer untouched, but a building housing a family planning clinic damaged with debris scattered over a large area. There is no fire.

List Outward Warning Signs or Indicators and Justification

List Special challenges:

Activity 1.1

Recognizing Suspicious Incidents

Scenario C

Numerous medical facilities within your community are suddenly overtaxed by an inexplicable influx of patients presenting similar symptoms. All of these patients visited a local mall during the past 48 hours.

List Outward Warning Signs or Indicators and Justification

List Special challenges:

SUMMARY

The threat of terrorism is real and can potentially affect all of us. According to Terrorism in the United States 1995, published by the Department of Justice,

"Terrorists in the United States continued a general trend in which fewer attacks are occurring in the United States, but individual attacks are becoming more deadly."

"Extremists in the United States continued a chilling trend by demonstrating interest in - and experimenting with - unconventional weapons. Over the past ten years, a pattern of interest in biological agents by criminals and extremists has developed."

"America and Americans have also been a favorite choice of target for terrorists. Reprisals for U.S. legal action against domestic and international terrorists increase the likelihood that Americans will be the target of terrorist attacks either in the United States or overseas."

Emergency responders need to always be aware of their surroundings and alert for any suspicious incidents. Protecting yourself from a violent terrorist act begins with recognition of the event.

MODULE 2: IMPLEMENTING SELF-PROTECTIVE MEASURES

TERMINAL OBJECTIVE

The students will be able to define the implementation of appropriate self-protective measures.

ENABLING OBJECTIVES

The students will:

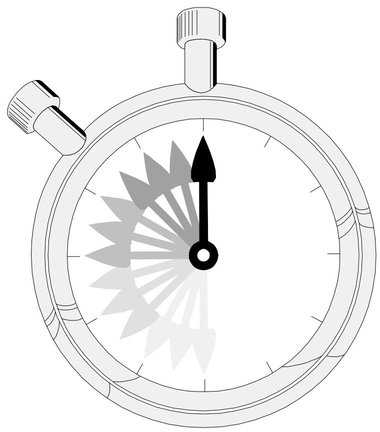
1. *Define the appropriate use of shielding at B-NICE incidents.*

2. *Define the use of time and distance as protective measures at B-NICE incidents.*

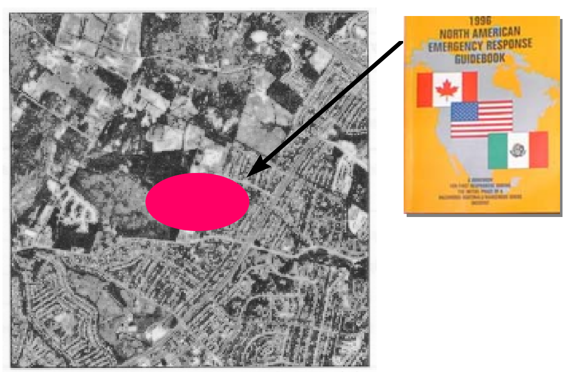
3. *Define the basic steps of emergency decon and routine post-exposure decon.*

INTRODUCTION TO TIME / DISTANCE / SHIELDING CONCEPTS

Protection of the first responder is based on avoiding or minimizing exposure through the principals of time, distance and shielding.



Time — Use time as a tool protect yourself at a crime scene. Spend the shortest amount of time possible in the hazard area or exposed to the hazard. An example of utilizing time constraints is rapid entries to execute reconnaissance or rescue. The less time you spend in the affected area, the less likely you are to become injured. Minimizing time spent in the affected area will also reduce the chance of contaminating the crime scene.



Overhead photo showing initial perimeter

Distance — Maximize your distance from the hazard area or the projected hazard area. One example of utilizing distance would be avoiding contact by following the recommended guidelines in the current edition of the <u>North American Emergency Response Guidebook</u> (NAERG) or your Standard Operating Procedures or Guidelines.

Shielding — Use appropriate shielding to address specific hazards. Shielding can be vehicles, buildings, chemical protective clothing and personnel protective equipment including structural fire protective clothing and positive-pressure, self-contained breathing apparatus.

PPE is a type of shielding

Responders should use **all three** forms of protection whenever possible. Just because you feel properly shielded does not mean that you can spend excessive time in close proximity to a contaminated site.

Remember: ***All forms of protection can be defined in terms of time, distance and shielding.***

Decontamination

While not strictly speaking a form of self-protection, decon is vital to prevent, reduce and remove contamination of both responders and victims.

Victim decon is performed to prepare contaminated victims for transport to medical care facilities. The overall procedure is to flush with water, remove contaminated clothing, flush again, cover the victim, and transport to medical care.

Emergency decon of a contaminated victim

A second form of emergency decon is **mass decon** which is designed for addressing large numbers of contaminated victims. In this case contaminated clothing is removed and the victim is flushed with water before being covered and sent to medical facilities.

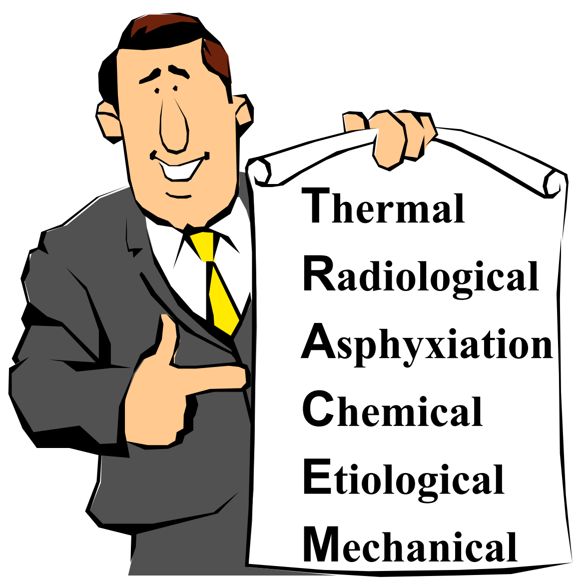
Responder decon is the standard decon of responders who have been protected by appropriate ppe. Follow your local protocols for this task.

TYPES OF HARM

To implement self-protective measures one must first understand the various types of harm you can be exposed to.

Harm can be categorized utilizing the acronym TRACEM, which provides an easy way to remember:

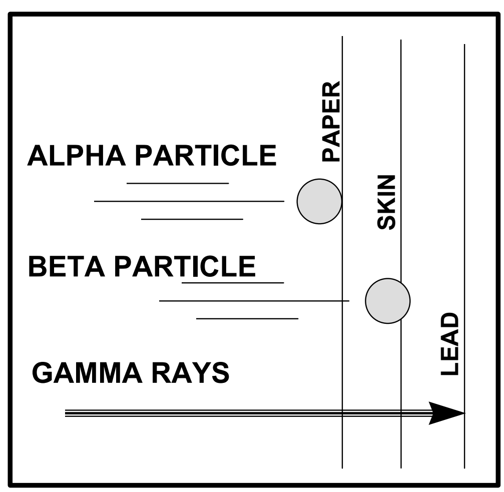
- Thermal;
- Radiological;
- Asphyxiation;
- Chemical;
- Etiological; and
- Mechanical harm.



Thermal harm may refer to harm caused by either extreme heat, such as that generated by burning liquids or metals, or extreme cold from cryogenic materials such as liquid oxygen.

While heat usually comes to mind as an example of thermal harm, cryogenic fluids such as the Liquid Oxygen stored here can also cause tremendous harm due to extreme cold.

Radiological harm refers to danger from alpha particles, beta particles or gamma rays.



The above chart shows the relative penetrating power of the three types of radiation.

Asphyxiation is caused by a lack of oxygen in the atmosphere. One common cause of this is heavier than air gases such as argon, carbon dioxide, or chemical vapors in a confined space.

Chemical harm is posed by toxic or corrosive materials. These can include acids such as sulfuric, caustics such as lye, and chemical toxins ranging from cyanides to nerve agents.

Etiological harm comes from either disease-causing organisms such as bacteria, rickettsia, and viruses or toxins derived from living organisms.

Mechanical harm is any sort of physical trauma such as gunshot wounds, slip, trip and fall hazards, and injury from bomb fragments or shrapnel.

IMPLEMENTING SELF-PROTECTION AT THE SCENE OF AN ARMED ATTACK

Types of Harm (TRACEM)

Armed attack incidents can include many different scenarios and types of weapons. Harm occurs from physical trauma inflicted from the weapon(s). Terrorists generally utilize weapons that can kill the largest number of persons in the shortest amount of time.

Mechanical harm is the primary form of harm from an armed attack.

Etiological harm may result from contact with blood and other bodily fluids.

During the discussion on implementing self-protective measures, write the various measures discussed in the appropriate place on the chart below.

Time	
Distance	
Shielding	

IMPLEMENTING SELF-PROTECTION AT AN EXPLOSION SITE

Oklahoma City

Overview of Bombing Incidents

Bombing incidents can involve a wide variety of materials from small pipe bombs to large vehicle bombs. The incident may involve an attack against a fixed target or a group of people such as emergency responders. The incident may be an isolated event or may involve secondary devices, booby traps or suicide bombers.

Grenade

Materials involved will always include some form of explosives. However, the detonation may be designed to disperse biological, chemical or radiological materials. The type of bomb involved may be an improvised explosive device or a commercially manufactured explosive.

The bomb itself may be equipped with various switches or controls that can be activated by light, pressure, movement, or radio transmission. For this reason, untrained personnel should never attempt to neutralize an unexploded device.

Bombs are the most frequent weapons currently used by terrorists. It is important to note that one of the bomb victims may be the bomber. For this reason all victims should be searched for weapons prior to transport.

Types of Harm (TRACEM)

Thermal harm is a primary hazard to those exposed to the heat generated by the detonation. It is usually not an ongoing risk unless there are unexploded materials present.

Mechanical harm is the other primary type of harm typically seen at bombing incidents. It can result from blast overpressure, shockwaves and fragmentation.

Radiological harm is a possibility if the device was designed for the purpose of dispersing radiological contamination or detonated in an area containing radiological materials. In this case, the hazard can persist for long periods of time.

Chemical hazards can come from products created as a result of the explosive reaction, from chemicals already present at the detonation site, or could have been included in the device for the purpose of being dispersed. All of these potential hazards need to be addressed by responders.

Etiological harm will be a primary risk if the device is used as a dispersion mechanism. Otherwise, it may be a secondary risk due to mechanical trauma.

Implementing Self-Protective Measures

When dealing with explosive incidents, the responder needs to address protection in terms of **pre-blast** and **post-blast** scenarios. Pre-blast is defined as that portion of operations that occurs after a written or verbal warning is received and before any actual explosion takes place. Post-blast refers to operations occurring after at least one detonation occurs.

Time	Pre-Blast
	Post Blast
Distance	Pre-Blast
	Post Blast
Shielding	Pre-Blast
	Post-Blast

IMPLEMENTING SELF-PROTECTION AT A BIOLOGICAL MATERIALS INCIDENT

Overview of Biological Incidents

Biological incidents will present themselves as either a focused emergency response or a public health emergency. A focused emergency is a situation where a potential or actual point source is located and attempts are made to prevent or minimize damage. A public health emergency manifests itself as a sudden demand upon the public health infrastructure with no apparent explanation for the occurrence.

Materials include bacteria, rickettsia, viruses or toxins. These materials are inhaled or ingested into the body to cause harm.

Bacteria are single-celled organisms that can grow in a variety of environments. Dangers to humans come from two directions; disease-causing bacteria growing in the body and those which grow outside of the human body but produce toxins which may pose a danger.

Rickettsia are a class of cellular life smaller than bacteria but larger than viruses. Rickettsia can only multiply inside living cells and cause diseases such as Q fever and typhus.

Viruses are the smallest known entity capable of reproduction. They only grow inside of living cells and cause those cells to produce additional viruses.

Toxins are poisons produced by living organisms. The organisms may be bacteria, fungi, flowering plants, insects, fish, reptiles, or mammals.

Types of Harm (TRACEM)

Etiological is the primary type of harm posed by biological agents. These materials are classified as class 6 hazardous materials by the US Department of Transportation

Chemical harm is a possible secondary hazard at the scene of a clandestine laboratory.

Mechanical harm is a possible secondary hazard where explosives have been used to disperse the agent.

Implementing Self-Protective Measures

Time	
Distance	
Shielding	

Activity 2.1

Incident Identification

Purpose

The purpose of this individual activity is for you to identify an incident through the use of outward warning signs and detection clues. You will then identify and list the potential types of harm associated with the incident and identify possible protective measures using time, distance and shielding.

Directions to Students

1. Listen to the case as presented by the instructor.

2. Answer the four questions posed in the text within 15 minutes.

3. The instructor will call upon individuals to answer the questions.

4. There will be an open discussion at the end of the activity.

Case Study

You are called to the grounds of a public festival in response to a reported explosion with multiple casualties. The explosive detonated under a performance stage.

Activity 2.1

Incident Identification
(cont'd)

Questions

1. List signs and clues for which you would observe upon arrival at the scene.

2. What is the primary type of harm that can be expected to have already occurred at this incident?

3. List 5 possible secondary forms of harm that may be present at this incident.

4. Identify methods of self-protection that could be utilized on this incident.

IMPLEMENTING SELF-PROTECTION AT CHEMICAL INCIDENTS

Chemical incidents can include many hazardous materials classes. Materials can be inhaled, ingested, absorbed, or injected. Materials can include industrial chemical or warfare type agents. Due to the wide variety of hazards posed by chemical agents, responders should take care to minimize exposure risks under all circumstances.

Responder utilizing appropriate PPE

Types of Harm (TRACEM)

Chemical hazards, of course, include a wide variety of effects including corrosivity, reactivity, and a variety of systemic effects which may attack the central nervous system, cardiovascular system, respiratory system, and other bodily functions. This will be discussed in far more detail later on in Module 4.

Thermal harm is also a possibility, since many chemical reactions create heat. Also the chemicals involved may be flammable.

Asphyxiation is a possibility due to the fact that some chemical reactions may deplete oxygen or create gases that displace oxygen.

Mechanical harm must be taken into account because corrosive chemicals like strong acids can weaken structural elements.

Implementing Self-Protective Measures

Time	
Distance	
Shielding	

IMPLEMENTING SELF-PROTECTION AT AN INCENDIARY INCIDENT

Overview of Incendiary Incidents

Incendiary incidents involve flammable devices that are either stationary or hand-thrown. Incendiary devices are used in approximately 20-25% of all bombing incidents in the United States. Incendiary materials can include many different chemicals and flammable or explosive devices.

Firefighters on the scene

Types of Harm (TRACEM)

Thermal harm is the primary type of harm from an incendiary.

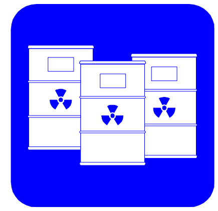
Chemical harm is also possible if the incendiary material releases a chemical hazard, or if other fuels present may generate chemical hazards.

Asphyxiation is always a possibility due to the fact that burning depletes oxygen.

Mechanical harm is possible from structural damage, thrown devices or secondary events or explosions.

Implementing Self-Protective Measures

Time	
Distance	
Shielding	



IMPLEMENTING SELF-PROTECTION AT A SUSPECTED NUCLEAR INCIDENT

Overview of Suspect Nuclear Incidents

Terrorist nuclear incidents are most likely going to involve the use of a radiological explosive dispersion device or other means to spread nuclear materials. Intelligence sources report that the use of a nuclear device to cause a nuclear detonation is highly unlikely, if not nearly impossible. Identifying a nuclear incident may be difficult due to the fact that radiation can not be detected by the senses and that symptoms of radiological exposure are generally delayed for hours or days.

Types of Harm (TRACEM)

Radiological harm is the primary danger from radiological materials. Due to the nature of the materials, this will represent an ongoing hazard, the scope of which will only be determined when the amount and identity of the substance involved is ascertained.

Chemical harm is also a concern due to the fact that many radiological substances are also chemical hazards. This is an area often overlooked by responders concentrating on radiation effects.

Implementing Self-Protective Measures

It is important to note that the use of radiological detection equipment is the best method to identify if your self-protective measures are effective and appropriate.

Time	
Distance	
Shielding	

Activity 2.2

Incident Identification 2

Purpose

The purpose of this activity is for you identify the incident through the use of outward warning signs and detection clues. You will then list the potential harm associated with a given incident and identify possible protective measures using time, distance and shielding.

Directions to Students

1. Listen to the case as presented by the instructor.
2. Answer the four questions posed in the text within 15 minutes.
3. The instructor will call upon individuals to answer the questions.
4. There will be an open discussion at the end of the activity.

Case Study

You are called to the scene of a traffic accident involving a van. One of the occupants of the van fled on foot after the accident. The second occupant was ejected during the accident and is unconscious next to the vehicle. When you look in the rear of the van you see a package approximately 12 inches x 12 inches x 8 inches. There are thick rubber gloves and a very thick and heavy apron in the back as well.

Activity 2.2

Incident Identification 2

Questions

Outward Warning Signs and Detection Clues.

1. List significant warning signs and clues available upon arrival at the scene.

2. What is the primary type of harm that can be expected to have already occurred at this incident?

3. List 2 possible secondary forms of harm that may be present at this incident.

4. Identify methods of self-protection that could be utilized on this incident.

Summary

Self-protection of responders at the scene of a suspected terrorist incident begins with **identification** of the incident through outward warning signs and detection clues. Responders must always be alert to the possibility that the event they are responding to is designed to position them as targets.

Once an incident is suspect, the site should be **evaluated** for potential harm. This can be accomplished by use of **TRACEM** as a guide. Once the possible harm is identified, self-protection should be implemented using time, distance and shielding.

This module clearly divides terrorist incidents into six distinct areas. Responders must realize that any one terrorist incident may involve multiple categories. All personnel will need to adapt to the situation as necessary.

Areas of terrorism response not discussed in this program are hostage and barricade situations. In such cases, all responders should coordinate responses in the context of a unified response in order to ensure the safety of all persons involved.

MODULE 3:
SCENE CONTROL

TERMINAL OBJECTIVE

The students will be able to define scene control issues involving isolation, evacuation and perimeter control associated with terrorist incidents.

ENABLING OBJECTIVES

The students will:

1. *Identify unique challenges that may confront responders when attempting to implement scene control.*

2. *State what hazard and risk components influence public protection considerations.*

3. *Describe what resources should be utilized to maintain perimeter security at a terrorist incident.*

INITIAL CONSIDERATIONS

Approaching a criminal event that has been created by an act of terrorism presents unique challenges to the responder. To effectively implement scene control and ensure public safety, emergency responders must quickly and accurately evaluate the incident area and determine the severity of danger. Once the magnitude of the incident is realized, attempts to isolate the danger can begin.

Establishing control (work) zones early will enhance public protection efforts and better facilitate medical treatment efforts.

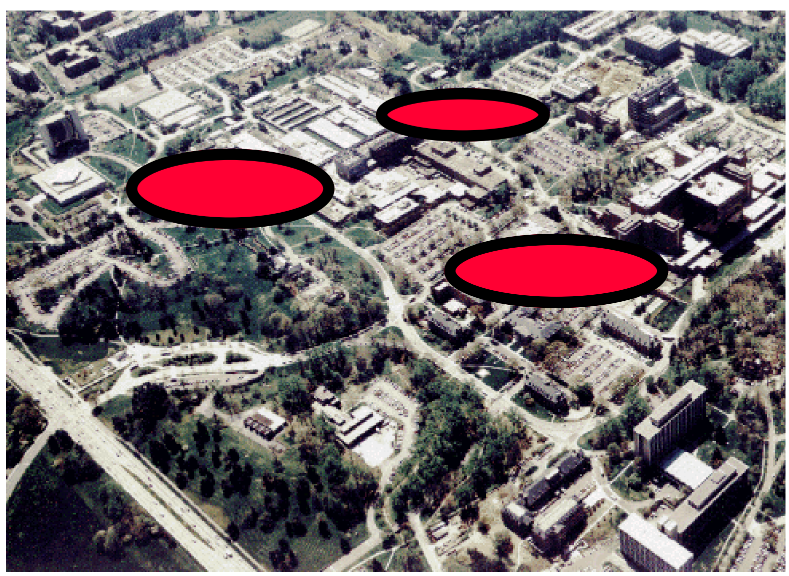
Initially, when response resources are limited, isolating the hazard area and controlling a mass exodus of panicked and contaminated people will likely overwhelm the best efforts of first arriving responders. Responders must use any and all available resources in an effective and efficient manner in order to prepare the scene for ongoing operations.

Responders must be aware that **terrorists may still be lurking nearby** waiting for responders to arrive. In fact, the responders could be the actual target.

Terrorists may also be among the injured. If this is suspected, initial scene control will likely be delayed and dictated by law enforcement activities.

As in all hazardous situations, **self-protection** is a top priority. A responder who becomes a victim only adds to the burden on available resources.

Responder must **anticipate the potential for multiple hazard locations**. Responders may have to define outer and inner operational perimeters. There may exist several hazards within the outer perimeter that must be isolated, especially when victims are scattered throughout the boundaries of the incident, or multiple targets contain dangers.



Multiple hazards can include secondary devices, multiple release points of biological or chemical agents, or even possible sniper locations.

Controlling the scene, isolating hazards and attempting to conduct controlled evacuations will be resource intensive. Inordinate security may be needed for the event, so responders should request additional assistance early.

After a bombing, access to the scene may be limited due to rubble or debris. Police activity may also interfere with establishing access and exit avenues for operations.

Another problem may involve large numbers of contaminated victims and would-be rescuers moving in and out of the exclusion zone in an uncontrolled manner. In chemical, biological and nuclear incidents, secondary contamination is a major risk factor.

PERIMETER CONTROL

Establishing Perimeter Control

Perimeter control at terrorist incidents can be established by following recognized methods or standard operating procedures. Maintaining control of the perimeter may be difficult due to the design of the terrorist or panic among the victims.

Recognizing and evaluating dangers is critical to implementing perimeter control. Adequately evaluating potential harm will guide decisions and considerations for "stand-off" distances, or establishing "work zones." In order to perform this task efficiently and effectively, you should first take time to perform an adequate **size-up** of the situation.

When initially determining your operating perimeter, it is better to overestimate the size of the perimeter than to underestimate. Once a perimeter is established, it is often easier to reduce the perimeter instead of attempting to push the public and the press back to increase it after operations are set up.

Depending on the size and complexity of the incident, the boundaries may need to be divided or identified as having "**outer**" and "**inner**" perimeters.

The **outer perimeter** is the most distant control point or boundary of the incident. It is used to restrict all public access to the incident. For example, the outer perimeter established after the bombing of the Alfred P. Murrah Federal Building in Oklahoma City enclosed 20 square blocks.

The **inner perimeter** isolates known hazards within the outer perimeter. It is often used to control movement of responders. An example of inner perimeters would be a case where following an explosion, several suspicious parcels are sighted. The locations of these items would be isolated until such time as specialists had rendered the area safe.

There are several types of terrorist incidents that may require outer and inner perimeter controls. Incidents involving **improvised explosive devices** should always have responders thinking about secondary devices. Use inner perimeters to control access to any suspicious area. In cases involving **chemical or biological dispersion devices**, you may need to use inner perimeters to isolate areas of high suspect contamination as well as possible secondary devices. In cases of **radioactive contamination**, inner perimeters may be necessary to isolate possible areas of high contamination until specialists with radiation meters have determined the actual level of danger to responders.

Perimeter Control Considerations

Perimeter control may be influenced by a variety of factors. They should all be considered and weighed in relation to each other when attempting to determine your next course of action.

The **amount and type of resources on-hand** will provide a rough estimate of what it is possible to accomplish.

The **capability of available resources** must also be considered. People should not attempt actions beyond their training.

The **ability of the resources to self-protect** is a related factor. No matter how well personnel are trained, if they are unable to properly protect themselves, they cannot function in a hazardous environment.

The **size and configuration of the incident**, as well as the **stability of the incident** will also come into play.

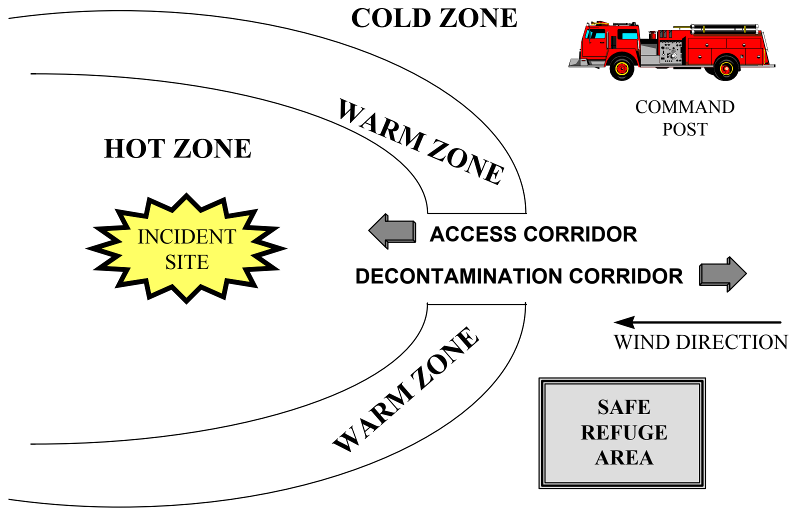
These factors are the same whether you are dealing with a non-criminal hazardous materials incident or a terrorist attack. Never lose sight of the fact that the behavior of a material is not determined by whether the release was accidental or deliberate.

Establish the Standard "Control Zones"

As with any hazardous materials incident, you should establish the standard **control zones** within the outer perimeter.

These include the:

- hot (exclusion) zone;
- warm zone; and
- cold (support) zone



Mapping Perimeter and Control Zones

Because of the potential for secondary and tertiary events, the perimeter and control zones should be mapped. If the incidents escalate, boundaries can be expanded using established reference points that are familiar to on-scene responders. Mapping components should include the **topography** of the area, and any **structures or landmarks**. **Access and egress points** should be clearly marked, as should **perimeter boundaries**.

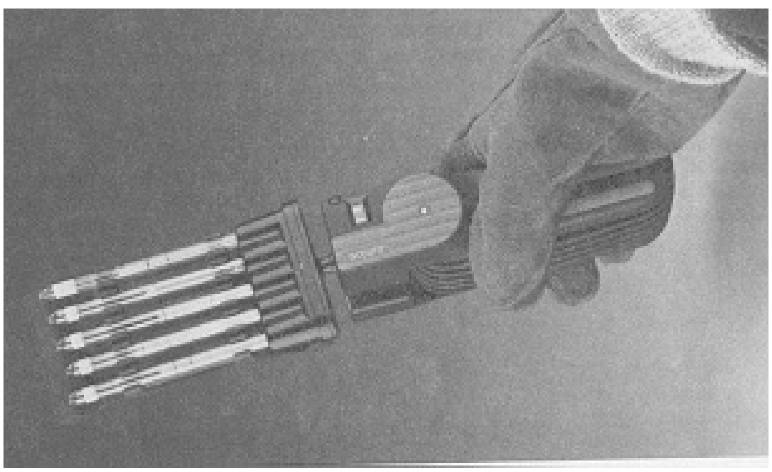
Responders using detection paper

Detection and Monitoring Equipment

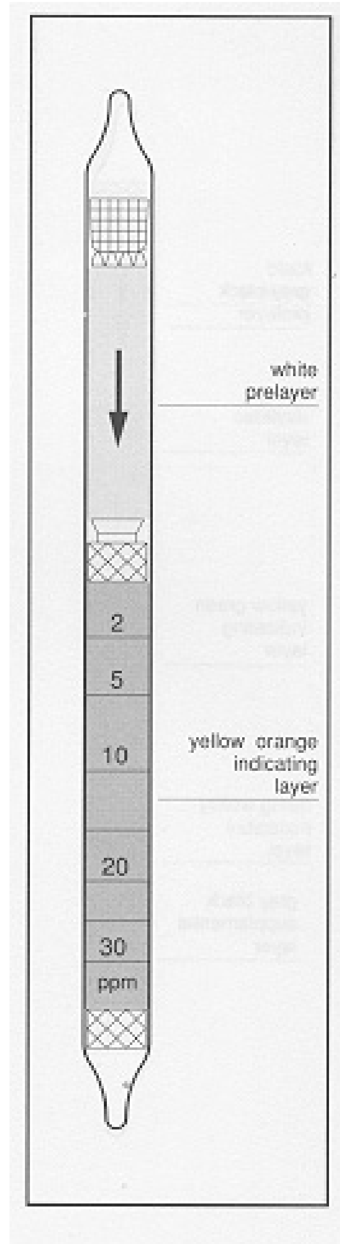
Using detection and monitoring equipment to substantiate effective perimeter and work zone boundaries is limited. Responders must attempt to identify "clean" areas as well as hazardous areas. This is usually accomplished by using detection and monitoring equipment while protected by appropriate personal protective equipment. However, equipment designed to detect hazardous materials may not be immediately available to first responders.

Some detection methods include colormetric tubes, detector kits and detection tickets. These methods typically include some sort of chemical that turns color when exposed to a specific agent or class of hazard.

Detection Paper



A device which can perform multiple analyses with colormetric tubes



Colormetric tube

Biological assays are a means of testing the behavior of an unknown sample against a specific organism. This is often used to test for biological agents of various types. **Electronic meters** may be used to test for various chemicals and radioactivity.

As opposed to chemical and/or biological detectors, **radiological detection equipment** is often available through hospitals or civil defense organizations.

In most cases, the responder will have to establish the perimeter by observing the scene for **outward warning indicators**. Developing the ability to recognize those indicators is a major part of this course.

Isolation / Stand-off Distance Considerations.

The first consideration is to identify the problem from incident information and outward warning signs and detection clues.

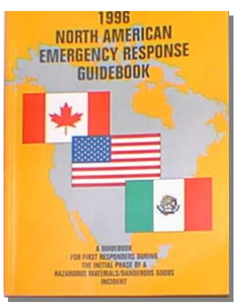
Incident information refers to information provided prior to the first responder arriving on the scene. This information can include written or verbal warnings and dispatch information. **Outward warning signs** and **detection clues** are collected during incident size-up operations.

Decision making for isolation is based upon four main factors. You should first consider the **potential of harm** to life, critical systems and property. If the potential harm is great, drastic measure may be called for.

Physical factors such as the **topography** and **meteorological** factors should also be considered. Wind direction, time of day, and impending weather should all be taken into account.

Lastly, responders must always consider the **resources available** to implement tactical operations. Consider how to use available resources to achieve tactical goals.

When making decisions concerning isolation and stand-off distances, access reference materials such as the <u>North American Emergency Response Guidebook</u> (NAERG) to determine initial isolation and protection distances.



When limited information is available pertaining to the agent, Guide 111 in the NAERG recommends minimal isolation distances of 50 to 100 meters (160 to 330 ft.) in all directions.

When responders suspect radioactive materials, the use of appropriate detection equipment is essential in determining isolation distances. Monitoring for radioactive materials at a bombing event should be done routinely. Monitoring is the only way to detect the presence of radiation on the scene.

Activity 3.1
Special Delivery

Purpose

The purpose of this activity is to identify the concerns responders should consider when faced with a potentially suspect incident involving clues to a specific class of hazard.

Directions to Students

1. An emergency call is received from your town's U.S. Post Office reporting an explosion. Responders arrive on the scene and discover several postal workers suffering from minor injuries. The workers report that a loud explosion occurred in the parcel package section which scattered small debris in all directions.

2. During your initial investigation, the postal supervisor advises you that twenty three workers were inside the building at the time of the explosion. You discover broken pieces of glass in the area where the blast occurred as well as a piece of paper displaying a symbol similar to that shown below:

3. Answer the questions below and record your answers on a flip chart.

4. Prepare to present your findings to the group.

Questions

1. What are the primary concerns at this point in the incident that need to be addressed by responders on the scene.

2. What secondary concerns should be considered at this event.

PUBLIC PROTECTION CONSIDERATIONS

Overview

Public safety will largely depend on the ability of responders to effectively conduct a hazard and risk analysis of the affected population. The same basic strategies used by responders to protect the public during a hazardous materials incident can be applied to a terrorist event. First arriving responders may be required to make rapid decisions that apply to implementing public protection measures because of escalating dangers. This being the case, those responders will need to base decisions on information gathered during the primary **size-up.** This can be a challenging task at any significant incident when so many demands are placed upon first arriving units. Remember that **size-up** is a continuous process of gathering information and factoring that information into making the best decision for a particular point in time.

During a large scale **B-NICE** event, consider the following options in defining your approach to protecting the public.

- **Evacuation** of all threatened populations.
- **Protect-in-place** for all.
- **Combination** of evacuation and protect-in-place by evacuating some populations and protecting others in-place.

Evacuation

Evacuating the public from danger is a decision based on information that indicates the public is at a greater risk by remaining in or near-by the event area. There are several categories of information that may influence your decision to evacuate.

You should determine the **degree or severity** of public dangers or threats as estimated by your hazards and risk analysis.

Determine the **number** of individuals or population area affected by the danger. (This can be determined by using the recommended isolation distances found in the NAERG.)

Identify the availability of the **resources** needed to evacuate the affected population. These resources may include additional fire/EMS/police personnel, school buses, privately-owned vehicles or public / mass transit.

Identify the availability of resources needed to **notify** the public and provide instructions before and during the evacuation. These may include the use of local media radio and television, mobile public address systems and door-to-door contact.

Identify safe passage and refuge areas for the evacuees. In order to do this, you should consider several factors.

Evacuation route security should be a major factor. Law enforcement agencies should control all routes of travel and provide security at destination points so these areas do not become additional targets for terrorists. Also, alternative shelters and travel routes should be prepared in case the primary areas become endangered.

Authorities should determine the **appropriate opportunity** to conduct the evacuation. Recognizing when the opportunity is available will involve a risk assessment taking into account ongoing law enforcement activities and uncontrolled hazards such as the presence of unexploded bombs or airborne chemical agents.

Always anticipate **delays** when planning the evacuation.

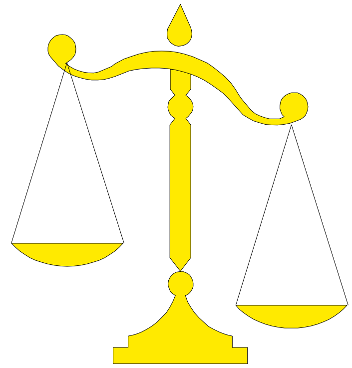
Responders must attempt to consider the **special needs** of the evacuees. A terrorist incident is likely to instill tremendous fear in the affected population. Evacuees should be be provided a continuous flow of accurate information regarding the event and information pertaining to mitigation and recovery efforts.

Protect-In-Place

Protection-in-place involves deciding to allow the affected population to remain within the confines of the shelter they occupy. The decision to do so, like evacuation, is based upon the hazard and risk analysis of the event. In principle, if the presenting and anticipated dangers to the public are determined to be less by having them remain in-place, rather than evacuate, then do so.

In certain situations (like airborne chemical hazards or line-of-sight exposure to explosives) when the best decision is to allow the public to remain in-place, remember that as long as there remains a danger, hazards and risk must be continuously evaluated. Estimate the degree of potential harm due to the duration of exposure and severity of the harm being exposed to.

Danger of evacuation vs. protect-in-place



The decision must be made on which is the lesser degree of danger to the public, the time it takes to evacuate to a safe refuge (coupled with exposure concerns while en route), and the potential risks of remaining in the shelter currently occupied.

Availability of resources

Are there sufficient resources on-hand to carry out an evacuation in a reasonable length of time? Can you do so while avoiding unacceptable exposure to the dangers? If not, protect-in-place may be the more viable option.

Level of public education and/or training

Is the public properly trained to effectively implement protect-in-place? Do they understand what materials may be used to create a 'safe room' in their homes? You may wish to consider community training as an option.

Combining evacuation with protect-in-place

There may be circumstances when using both evacuation and protection-in-place would be appropriate. For example, when response resources cannot immediately support the evacuation needs of large populations. Responders may consider providing instructions to people more distant to the dangers, advising them to remain indoors until further directives are given. People in the path of greater danger could be systematically evacuated in concert with available resources.

Your jurisdiction may already have guidelines or procedures relating to public protection scenarios, if so, follow them, if not consider establishing methods to address these issues that will support your operation.

SCENE SECURITY CONSIDERATIONS

Once the incident commander has assumed site control responsibilities, all entry and exit routes from hazardous areas must be effectively managed regardless of who has been tasked with the responsibility. Conventional methods of isolating unstable conditions, designating access points, establishing contamination reduction corridors and organized evacuations, should all be considered essential functions under site control and security responsibilities.

Site Security / Agency Responsibility

The agency assigned or designated with site security responsibilities will likely vary according to available resources (early in the incident a combination of police and fire personnel may jointly perform scene control and hazard isolation duties). Any time there is ongoing or unstable criminal activity present, law enforcement officials should dictate security measures for scene control. As the incident becomes more defined and more stable (intermediate phase), the shift from a combination of police and fire personnel in control of the perimeter, should begin to transition to all law enforcement. If the incident is of such magnitude that response activities may continue for days, the use of military units should be considered for perimeter security and control.

TACTICAL CONSIDERATIONS

When you approach any type of suspicious incident, you should do so in a cautious manner with all senses alert for warning signs and detection clues.

Always approach the scene utilizing **protective clothing and equipment** supplied by your agency. As with all incidents, self-protection is your first priority. If you're not properly protected, you will be unable to effectively function.

Be alert for **outward warning signs** that may indicate the type of danger present. Just because an explosion was reported, do not discount the possibility of chemical, biological, or radiological hazards.

Pay attention to casualties without apparent physical trauma as well as signs and symptoms indicating chemical exposure. In the next module, we will explore specific symptoms of various agents, but a major hint of chemical exposure can be derived from the conjunction of multiple casualties and little physical injury.

Obvious signs of **criminal activity**, such as weapons on the scene, may indicate a perpetrator among the victims or lurking nearby. Coordinate your efforts with law enforcement agencies.

Pre-incident verbal or written **warnings** should always be taken seriously.

Properly Stage Vehicles

During emergency conditions (especially if the incident has created large scale public chaos and panic) responders must realize when approaching the event, presenting conditions may not provide the most ideal locations to stage vehicles and apparatus.

When practical, position first-in vehicles and responders **upwind** and **uphill**. Direct supporting responders to approach upwind and uphill.

Avoid 'stacking' vehicles where they interfere with each other's evacuation route. Also avoid line-of-sight staging with suspected explosive devices. Strictly enforce staging instructions.

Avoid Vapor Clouds, Mist and Unknown Liquids

If it's unknown, it's unsafe. Protect yourself.

Assign an Observer

Initially, assign at least one responder to observe on-going activities surrounding your operating position. This person should be alert for criminal activities and the potential for secondary events.

The individual assigned to observation duty should closely observe the entire scene for potential armed assault (snipers), containers which could hold secondary devices (bags, boxes, briefcases, etc.), vehicles out-of-place, hazardous materials containers, or other anomalies. Suspicious areas should be identified and isolated until cleared by appropriate authorities.

Plan Tentative Escape Routes and Refuge Assembly Points.

Coordinate with law enforcement and other local agencies to identify safe escape routes and where possible refugees can go. It's far better to not need your plan than to not have it when you do.

Prepare for Emergency Decontamination on Arrival and During All Phases of the Incident.

Performing emergency decontamination

Your agency should have pre-defined plans for emergency decon of large (mass decon) and small groups of contaminated personnel. These plans should be developed and maintained with the assistance of local medical and legal authorities in order to provide technically correct decon without incurring potential liability for privacy violations.

Secondary contamination of responders and other members of the public is always a concern. Remember to treat all members of the public with proper regard for privacy as well as safety when performing decontamination operations. Responders who do not have been subject to lawsuits and adverse judgments.

Activity 3.2

Explosive Feature

Purpose

The purpose of this activity is for you to recognize which scene control measures should be implemented at the early stage of a terrorist event. This activity will include identifying challenges which are unique to responders attempting to control the scene and what resources will be needed to support and maintain that effort. You will also be asked to list various types of hazards and risks that may influence public protection considerations.

Directions to Students

1. Listen to the case as presented by the instructor.

2. In your small groups, use the map printed on the next page of your manual to determine where you will place various elements of the response including the command post, triage area, and safe refuge location. Also identify where you would stage incoming units.

3. List three to five scene control considerations appropriate to this scenario and indicate which of the control measures are unique to possible terrorist events.

4. Record your decisions on a flip chart.

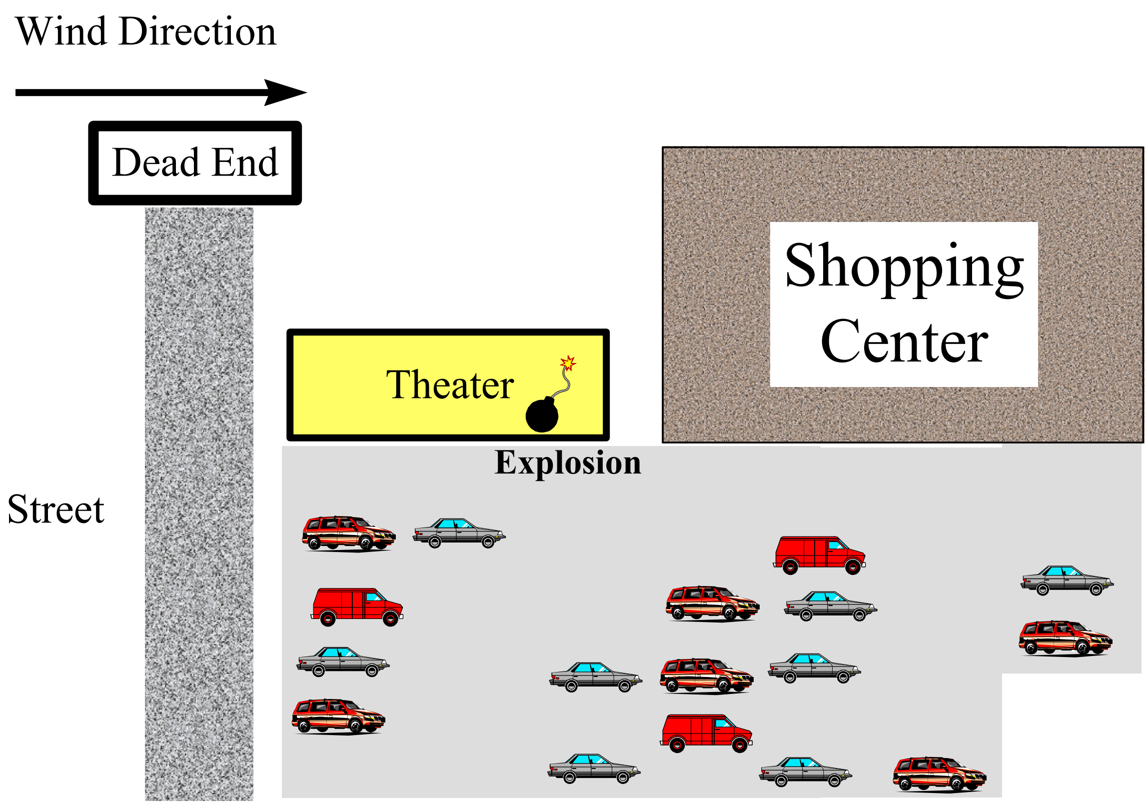
5. Have one member of your group present your findings.

Case:

You are responding to a reported explosion at the multiplex cinema located near a large shopping mall. The cinema building is detached from the mall but located in the same parking lot. The dispatch center has advised you of numerous reports of injuries in the lobby and occupants evacuating the building.

Activity 3.2

Explosive Feature



Summary

Terrorist incidents will likely present unique challenges to public safety responders when attempting to implement scene control measures. Responders must realize the importance of initiating appropriate scene control early in the event. Although the magnitude of the incident may seem beyond the capabilities of the first arriving units, efforts to gain control must start immediately, regardless of the resources on hand. Equally important is the need for responders to recognize outward warning signs on arrival. Responders who perform scene control tasks must incorporate full use of protective clothing and equipment until such time as the incident is well defined (by work zones) or determined to be safe.

MODULE 4:
Tactical Considerations

TERMINAL OBJECTIVE

The students will be able to recognize, define, describe, and recommend tactical objectives for Biological, Nuclear, Incendiary, Chemical, and Explosives (B-NICE) incidents.

ENABLING OBJECTIVES

The students will:

1. *Identify outward warning signs of B-NICE incidents.*

2. *Define and explain tactical considerations associated with acts of terrorism involving biological, nuclear, incendiary, chemical, and explosive materials.*

3. *Identify and list specialized equipment needed to support tactical operations involving B-NICE incidents.*

4. *Given a case study, identify tactical considerations for each incident category.*

BIOLOGICAL AGENTS

Introduction to biological agents

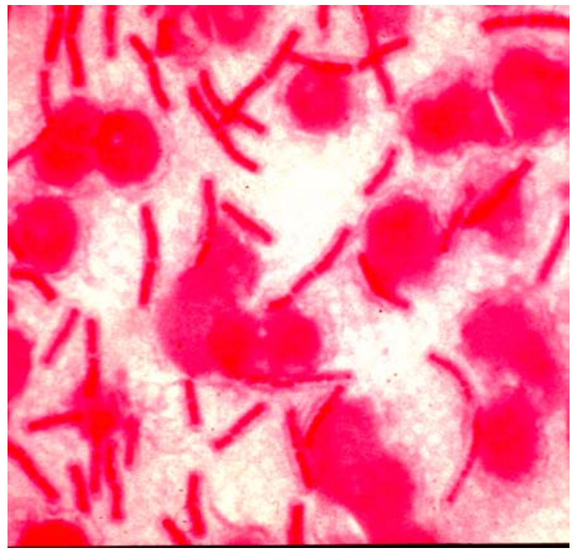
Biological agents can be either disease-causing organisms (bacteria, rickettsia or viruses) or toxins produced by living organisms.

Biological agents are generally split into three groups.

Bacteria and Rickettsia — Single-celled organisms which cause a variety of diseases in animals, plants, and humans. They may also produce extremely potent toxins inside the human body.

Although true cells, rickettsia are smaller than bacteria and live inside individual host cells.

The Anthrax bacillus is one of the best-known weaponized bacteria ⇒



Viruses — Much smaller than bacteria, and use host cells' reproductive mechanism to make additional viruses.

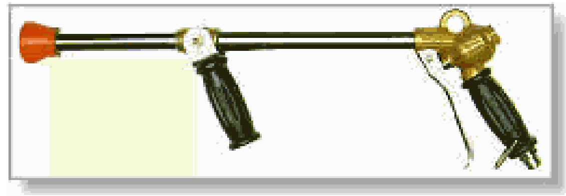
Toxins — Potent poisons produced by a variety of living organisms including bacteria, plants, and animals.

How are biological agents disseminated

There are a wide variety of means to disseminate biological agents. We'll look at some, but not all, methods here.

One of the most common and effective methods of disseminating biological agents is through **aerosol dispersion** to produce an airborne hazard.

Crop sprayer attached to helicopter



Spray attachment for hose, tank or compressor

An agricultural sprayer can be used to spray just about anything. A typical commercial unit has dozens of nozzles which produce a particle size between 2 and 6 microns. This is an ideal size for spreading biological agents such as anthrax spores. There are no restrictions on sale or purchase of these units and they are sold all over the world for agricultural use.

Another means of disseminating biological agents is by contaminating food, water or medicine affecting those who **ingest** the material.

Terrorists sprayed salmonella on salad bars in the Northwest which caused over 700 people to become ill. These same terrorists could have used ricin or some other deadly agent that could have killed those whom the salmonella merely made ill.

Another means of exposing a target to a biological agent is through **dermal exposure** by direct contact or injection. One recent incident illustrates an example of this technique.

Georgi Markov was a Bulgarian journalist who wrote in 1968 about corruption in high government offices in Bulgaria. He was forced to flee Bulgaria for Italy and eventually England. While living in London he continued his reports on Bulgaria and its problems as a reporter for Radio Free Europe. One morning while waiting for a bus, he was jabbed in the thigh with an umbrella. His health quickly deteriorated and he died four days later. An autopsy revealed a small metal pellet near the wound. After analysis, it was found to have contained less than .01 grams of ricin. This tiny amount was more than enough to kill him.

As discussed in Module 2, **focused response** and **public health emergencies** are two types of incidents which may indicate a biological agent.

A **focused response** incident involves a single, known point-source of contamination. One example of this would be an individual who stands up in a restaurant or theater, announces that the glass vial in his/her hand contains anthrax, and then breaks the vial.

The results of spraying salmonella on salad bars in the Northwest is an example of a **public health emergency**. Hospital emergency rooms and clinics began reporting excessive numbers of patients with symptoms of food poisoning. It took skilled medical detective work to finally trace the illnesses back to contaminated salad bars and then to trace the contamination to a religious group which had been having a dispute with the local town.

Potential bacteria or rickettsia

Anthrax
Plague
Tularemia
Q Fever

Anthrax

Anthrax Infection

Anthrax is an acute bacteriological disease which can manifest itself as either a skin infection contagious by direct skin contact only, or in it's much more deadly inhalational form.

The skin infection starts with a gradual itching and then gradually turns into a depressed lesion which becomes black. This form is pictured at the right. This form may turn septic and spread throughout the body via the bloodstream and lymph node. Untreated cutaneous anthrax has a fatality rate of 5-20%.

Inhalational anthrax has two phases. After an incubation period of one to six days, the initial symptoms include malaise, fever, fatigue, non-productive cough, and chest discomfort. The second phase develops suddenly with the development of severe shortness of breath and cyanosis. Shortly after this phase, the terminal phase develops and typically lasts less than 24 hours usually ending in death despite therapy.

Plague

Pneumonic plague is the airborne form of the so-called 'black plague'. Symptoms include a cough with bloody sputum, fever, and pathogenic (dead) tissue in the lymph nodes. It is rapidly fatal and highly contagious.

Initial infections of plague are usually due to a bite from a flea carrying the disease. This leads to **bubonic plague**, which is recognized by swollen and tender lymph glands.

Bubonic plague may progress to either the **septicemic** form where the blood carries the infection throughout the body and/or the **pneumonic** form in which the lungs become involved. Untreated septicemic and pneumonic plague are invariably fatal. The greatest public danger is from pneumonic plague because the victim produces an infectious aerosol which is highly contagious. This is the form that causes epidemics among the human population. For more information, you should access texts such as Control of Communicable Diseases Manual, published by the American Public Health Association.

Tularemia

Three to five days after exposure to aerosol Tularemia, there is an abrupt onset of fever, chills, headaches, muscular pain (myalgia), etc., with non-productive cough. It can be fatal, but is not considered contagious.

Q fever

Q fever is caused by a rickettsia-type organism and is rarely contagious. Symptoms include those commonly associated with the flu, acute hepatitis and pneumonia. Other symptoms are inflammation of the brain and the three membranes or meninges surrounding the brain and spinal cord (meningoencephalitis), inflammation of the membranes surrounding the heart (pericarditis), and inflammation of the myocardium or muscular middle layer of the heart (myocarditis). Normally not fatal.


Ebola Virus

Potential viral agents

Viruses are different from bacteria in that they grow and reproduce by hijacking the mechanism of individual cells and forcing those cells to produce additional viruses. This results in an infection that may be more difficult to treat than one caused by bacteria.

Smallpox

Smallpox is infectious as an aerosol. It is highly contagious and has a high mortality rate. After a seven to seventeen day incubation, the pox-like rash starts and patients may present fever, muscle rigidity and shivering, malaise, headaches, vomiting, and other symptoms. Scabs start forming eight to fourteen days after the onset of the disease and leave depressed pigmented scars.

Smallpox is officially extinct outside of the laboratory. There are two stocks of smallpox virus known to exist; one in Russia and the other in the laboratories of the Centers for Disease Control in Atlanta.

Venezuelan Equine Encephalitis (VEE)

VEE is a mildly contagious disease with an incubation period of one to four days. Symptoms usually include fever, headaches, myalgia and vomiting. They may also include drowsiness, chills, sore throat and diarrhea. Can be fatal.

Viral Hemorrhagic Fevers (VHF)

Hemorrhagic viruses include Ebola, Yellow Fever, Dengue Fever, Crimean-Congo Hemorrhagic Fever, the Hantaviruses and several others. Symptoms include fever, muscular pain (myalgia), headaches, prostration, hemorrhage, capillary leaks, hypotension, and shock. They are considered moderately contagious but often fatal.

Potential toxins

Toxic substances are produced by almost every major category of living organism known. Many of the most deadly are produced by fungi, flowering plants and bacteria.

Botulinum toxins consist of seven related neurotoxins produced by the Clostridium Botulinum bacteria. They are some of the most potent toxins known and cause life-threatening paralysis leading to progressive weakness of extremities and respiratory muscles leading to respiratory failure. Symptoms can occur as quickly as 24 hours after ingestion.

Growing Botulinus Bacterial

Staphylococcal Enterotoxins commonly cause food poisoning after the toxin is produced in and ingested from improperly handled foods. Inhalation of aerosolized toxin can lead to septic shock and death

Ricin is a water-soluble constituent of castor beans. The wash from preparing castor oil contains up to five percent ricin. As little as a milligram (1/1000 of a gram) can kill an individual. Symptoms from inhalation of ricin include necrotizing (tissue-killing) lesions (injury or abnormality) of upper and lower airway, necrotizing pneumonia and pulmonary edema (accumulation of fluid in the lungs). Symptoms from ingestion or intramuscular injection include gastric bleeding, liver necrosis (death), lymphoid necrosis, spleenitis (inflammation of the spleen), and pulmonary congestion.

Note: Ricin was patented by the United States Army in the 1960s.


Castorbean Plant
(Ricinus communis)

Mycotoxins (Trichothecene Mycotoxins) include more than 40 toxins produced by various fungi. Some of these toxins are extremely stable and easy to produce and spread as aerosols. Symptoms can include weight loss, vomiting, bloody diarrhea, diffuse hemorrhage, and skin inflammation. Some may cause death.

Outward warning signs and detection clues for the presence of a biological agent

There are a number of outward warning signs and detection clues which can alert the responder to the possible presence of biological agents both prior to an incident and at the incident scene.

Verbal or written threats should always be taken seriously. They may provide invaluable clues to the agent and its hazards.

Suspicious bombing incidents that do not cause much blast or fire damage may have been detonated for the purpose of disseminating a biological agent.

Watch for abandoned **spray devices** out of place for the environment. They may be key evidence in the eventual investigation, as well as a clue to the type of hazards you face.

Containers from laboratory or biological supply houses, biohazard, culture or culture media labels are all indicators of a possible biological agent hazard.

Clandestine Laboratory

Detection methods for biological agents

On-site detection of biological agents is currently not practical for most first responders. Typically, samples are collected using various techniques including bioassay, mass spectrometry, gas chromatography, and culture of living organisms.

Bioassay may be used for living organisms and some toxins. Bioassay techniques involve taking an unknown sample and comparing its effect on an organism against that of a known substance. Field-deployable, rapid assays are needed for on-site diagnosis of BW agent exposure. Researchers within the U.S. Army and Navy laboratories are developing assays for botulinum toxin, ricin, plague, brucellosis, Q fever, anthrax, and several viruses. Rapid diagnostic assays were made available to Theater Area Medical Laboratories during Operations Desert Shield and Storm, along with drugs, vaccines, and laboratory equipment.

Mass Spectrometers ionize a sample and then apply electric and magnetic fields to the charged particles (ions). Analysis is derived from measuring the behavior of the ions when exposed to the fields. There are several types of mass analyzers, but any more technical discussion would be far beyond the scope of this course.

Some mass spectrometers and gas chromatographs are designed for field use .

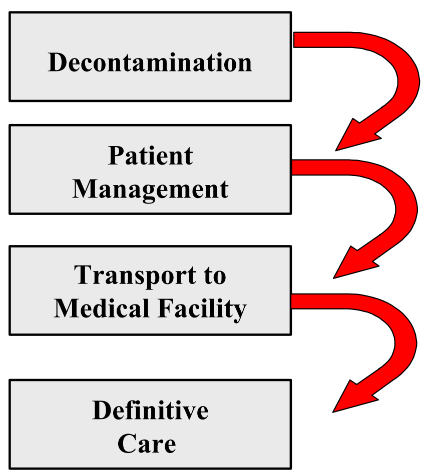
Chromatographic analysis of residue for toxins involves placing an unknown residue in either a single solvent or solvent blend and then comparing the behavior of the dissolved material when subjected to certain pressures and tests against that of known substances. There are several types of chromatography used, involving both liquid and gaseous materials, but all follow the same basic principles. Mass spectrometry and gas chomatography are often combined into a technique often referred to as "mass spec./G.C."

Proper self-protection techniques

Proper self-protection techniques should include respiratory protection, splash protection (boots and gloves) and Emergency Medical Service (EMS) universal precautions coupled with body substance isolation. Additional material may be found in Appendix H.

Treatment procedures

Treatment procedures for casualties should generally follow this sequence according to local protocols:



Decontamination covers a broad scope of activities. **Victim decon** is performed to prepare contaminated victims for transport to medical care facilities. The overall procedure is to flush with water, remove contaminated clothing, flush again, cover the victim, and transport to medical care. A second form of emergency decon is **Mass decon** which is designed for addressing large numbers of contaminate victims. In this case contaminated clothing is removed and the victim is flushed with water before being covered and sent to medical facilities. **Responder decon** is the standard decon of responders who have been protected by appropriate ppe. Follow your local protocols for this tasks.

Available technical resources

1. Local and state resources as indicated in your plan.
2. U.S. Public Health Service (USPHS) or the Centers for Disease Control (CDC).
3. Federal Bureau of Investigation (FBI).
4. Department of Defense (DOD).

Notifications

Your jurisdiction should have prepared plans. Make appropriate notifications as indicated in your local emergency plan.

Activity 4.1

Powder in the Court

Purpose

During this activity, you will:

- Identify the outward warning signs for the case presented;
- Identify tactical considerations that may be implemented for the given student exercise;
- Identify and list specialized equipment needed to support tactical operations for the given student exercise; and
- Identify and list available technical resources outside of the local and state level that may be of assistance for the given student exercise.

Directions to Students

1. Listen to the directions and information presented by the instructor.
2. Working as a group, discuss the case in the activity and answer the questions listed.
3. Use only the information presented in the case and material covered in this course.
4. Ask the instructor for assistance if you do not understand the question.
5. Record your responses on a flip chart.
6. Your group has 15 minutes to complete the exercise.

Activity 4.1

Powder in the Court
(cont'd)

Case:

At 9:00 a.m. on Monday the town emergency communications center received an emergency call from a bailiff at the local courthouse. The bailiff reported that powdery material was coming out of the ventilation system in the courthouse building. When he went to investigate he found two individuals pouring a white powder from a pint jar into the air ducts. He placed the subjects under arrest. While the bailiff questioned the subjects they stated that everyone in the courthouse was going to die. They further stated they made the material themselves using beans and directions in a book. The bailiff immediately evacuated all 150 people from the courthouse and called the town emergency number for help.

The town dispatcher sent two law enforcement officers, a fire truck and ambulance to the scene. Enroute the report from the bailiff was provided to the responders.

Questions

1. Identify two outward warning signs and detection clues that are present in the given scenario.

2. Identify 2 major response challenges for the given scenario.

SELF-PROTECTION

3. Identify the potential harm to first responders using the terms called out in TRACEM.

4. Identify self-protective measures for first responders in terms of time, distance and shielding.

5. Identify at least one method for detecting suspect material.

6. What needs to be accomplished once you suspect that everyone in the building was contaminated.

7. List the available technical resources that may be used in this incident.

NUCLEAR TERRORISM

Introduction

There are three potential forms of nuclear terrorism. they include:

- Detonation of a fission device ("atomic bomb");
- Release and dispersal of nuclear materials by packing the nuclear material around a conventional explosive device; and
- Large-scale conventional explosive device detonated in proximity to a target containing large amounts of nuclear materials (power plant or similar facility).

Detonation of a fission device

An unlikely scenario

The potential for encountering a nuclear bomb is minimal. Terrorists would find it extremely difficult to build or acquire and use such a device for several reasons.

In order to build a device, substantial quantities of weapons-grade fissionable materials are needed. There are three potential sources of fissionable materials - shipments of spent nuclear fuel, acquisition through black markets and theft from secured facilities. Materials acquired from shipments of spent nuclear fuel or on the black market are unlikely to be pure weapons grade material and will need further refining, which requires specialized knowledge, skill, money, and equipment. Theft from secured facilities is extremely difficult and often suicidal. The largest seizure of weapons-grade Uranium as of 1995 was 2.72 kilograms (about 6 pounds), which should not be enough to build a fission bomb. Once materials are obtained, they are very difficult to transport. A given volume of uranium weighs about 18.7 times as much as water. Therefore, a gallon jug filled with powdered uranium would weigh about 156 lb., not counting the shielding required for safe transport!

Building a nuclear device is much more than assembling the requisite quantity of fissionable material. The purified material must be machined into precise shapes and exact quantities of explosives packed around the fissionable material in a geometry that ensures the proper creation of a critical mass for the short time necessary for the reaction to occur. If this is not done, the device will simply scatter the fissionable material over the area instead of detonating.

Theft of an operational nuclear device would be even more difficult than acquiring the materials to build one. Strict national and international security measures make it very unlikely that an entire bomb could be acquired. Even if such a device was stolen, all Western and former Soviet nuclear devices incorporate the Permissible Action Links (PAL) security system which will render the weapon safe unless the correct multi-digit code is entered.

The Radiological Dispersal Device (RDD)

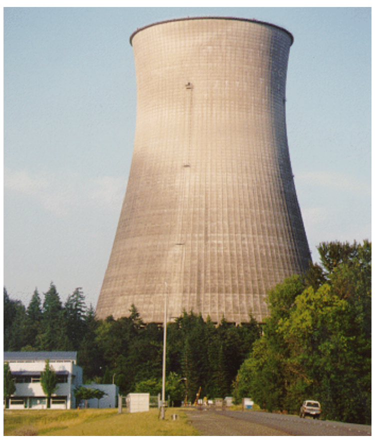
Using conventional explosives to spread radioactive contamination is far more likely than an actual nuclear detonation. In this scenario, radioactive materials are packed around conventional explosives. When the explosive device detonates, it disperses the radioactive material over a wide area. Depending upon the material, both long-term and short-term hazards can be generated with such a device. Immediate dangers include radiation burns and acute poisoning. Long-term hazards include various forms of cancer and contamination of ground water. This can lead to forced abandonment of large areas or even entire towns.

The New York Times reported that on November 23, 1995, the Russian Independent Television Network was contacted by a Chechan separatist organization and told of the location of a package in Ismailovsky Park in Moscow. The 30 pound package contained radioactive Cesium (a gamma ray source) and explosives. The device was rendered harmless before it could detonate.

One reason that radiological dispersion is a far more likely scenario than nuclear detonation is that weapons grade fissionables are not required for this type of device. Significant amounts of radioactive materials are used in a variety of industrial products, such as radiographic units used to test bridges, buildings, and other structures.

A constant source of anxiety in today's world is the amount of radioactive material which may not be under proper control. This includes the remains of nuclear power plant incidents such as the Chernobyl disaster. The materials still present in the vicinity of that incident could provide a virtually unlimited source of radioactive materials for dispersion devices.

Part of the Chernobyl complex



Nuclear power plant

Targeting Nuclear Facilities

A third possible form of nuclear terrorism is to target a facility containing nuclear materials. This could be done by attacking a facility containing large amounts of radiological material with conventional explosives in the expectation that the result would be widespread contamination.

Outward warning signs and detection clues

Outward warning indicators include placards, labels and specialized packaging. Responders should be well-acquainted with the standard radiation warning symbols and hazardous materials containers. For additional information, check the North American Emergency Response Guidebook.

Radiation detector with two probes

Detection methods for nuclear contamination

Electronic equipment will likely be the only means of testing an area for radiation. Properly trained responders should survey any incident scene with radiation detectors following a suspicious explosion or terrorist threat.

There are many types of radiation detectors, including some which provide an audible warning if dangerous levels are detected.

Even if a threat does not explicitly mention radiation, a radiological survey should still be done at any suspicious bombing incident. The terrorists may want to disguise the lasting threat of radioactive contamination by allowing authorities to assume a conventional explosives incident.

Self protection

As discussed in Module 2, implement personal protection through time, distance and shielding. The primary protection against harmful radiation is to keep as much mass between yourself and the source as possible. Since Alpha radiation does not penetrate the skin, positive-pressure self-contained breathing apparatus (SCBA) will provide complete protection against this form of radiation.

Treatment procedures for casualties

Follow the same process of decontamination, patient management, transport to medical facilities (hospital), and definitive care from medical field as discussed earlier.

Available technical resources

- Local and state resources as indicated in your plan.
- Department of Energy (DOE).
- Federal Bureau of Investigation (FBI).
- Department of Defense (DOD).

Notifications

Make appropriate notifications as indicated in your local emergency plan.

INCENDIARY DEVICES

Introduction

Incendiary devices have been used by terrorists for centuries. Fire is a flexible tool that is capable of causing property damage, loss of life, and sparking panic among the public. It will also continue to spread and do damage until all available fuel is consumed, or the fire is extinguished.

The Irish Republican Army (IRA) has used incendiary devices throughout Europe for many years resulting in deaths, injuries, and tremendous monetary losses.

In the United States the use of incendiary devices is on the rise. According to data from the FBI Bomb Data Center:

Incendiary devices were used in approximately 20-25% of all bombing incidents in the United States.

When used, incendiary devices ignited approximately 75% of the time; and
Less than 5% of actual or attempted bombings (including those involving incendiaries) were preceded by a threat.

The FBI Bomb Data Center is available on-line and is referenced in the bibliography for this manual.

Classification of Incendiary Devices

Incendiary devices can be classified in a number of ways. Two common classifications are by triggering and delivery methods.

Incendiary Devices

- **Triggering Method**
  - Chemical Reaction
  - Electronic Ignition
  - Mechanical Ignition
- **Delivery Method**
  - Hand-thrown
  - Stationary
  - Self-Propelled

Under **triggering methodology** there are several different means of initiating the incendiary reaction. Chemical reactions, including burning fuses are a staple of the trade. Electronic ignition through a variety of relays, switches, and other devices is another means. Finally, mechanical ignition may be used to initiate the event.

The types of delivery can include hand-thrown devices like molotov cocktails, stationary or planted devices, and self-propelled incendiaries like rockets or flare gun projectiles.

Components of incendiary devices

Incendiary devices are composed of three components.

An **ignition source** is needed to initiate the incendiary reaction. **Combustible filler material** provides the bulk of the material that actually ignites, while a **housing** or container is required to hold the filler.

Results of a Molotov Cocktail

Materials used to construct incendiary devices

Incendiary devices may be constructed from a wide variety of materials. Some of the products which have been used to construct incendiary devices include:

- Roadway flares;
- Gasoline and motor oil;
- Light bulbs;

- Common electrical components and devices;
- Matches;
- Household chemicals;
- Fireworks;
- Propane and butane cylinders; and
- Plastic pipes, bottles and cans.

Outward warning signs and indicators of incendiary use

For those of you familiar with arson investigations, many of the detection clues for incendiary use will be very familiar. They include:

- Prior warning (phone calls);
- Multiple fire locations;
- Signs of accelerants;
- Containers from flammable liquids;
- Splatter patterns indicating a thrown device;
- Fusing residue;
- Signs of forced entry to the structure; and
- Common appliances out of place for the environment.

These clues should simply be a signal for you, the responder, to take appropriate precautions to safeguard yourself and the public, and to start considering the incident as a potential crime scene.

If you wish to become more involved with incendiary devices and their use in criminal activities, you may wish to consider the Arson Curriculum offered by the National Fire Academy.

Detection methods

Various methods of detecting chemical residue indicating incendiary use are available including colormetric tubes, combustible gas meters, flame ionization detectors, trained dogs, and photoionization detectors.

Photoionization detector

Self protection

You should always approach the scene of a suspicious fire utilizing appropriate personal protective clothing and equipment.

Do not handle any suspicious device. The device may have failed to ignite or may be a secondary device timed to target responders.

Avoid vapor clouds, mists, and liquids. If you don't know what it is, you can't be sure of being properly protected.

Call for technical assistance.

Treatment of casualties

Except that decontamination may not be necessary, follow the same process of decontamination, patient management, transport to medical facilities (hospital), and definitive care from medical field as discussed earlier.

Additional Resources

- Local and state resources as indicated by your plan.
- Bureau of Alcohol, Tobacco, and Firearms (BATF).
- Federal Bureau of Investigation (FBI).

All tactical considerations will be influenced by local standard operating procedures. Local emergency responders at suspected incendiary incidents should be aware of basic crime scene considerations, such as restricting access and preserving evidence.

CHEMICAL AGENTS

Introduction to Chemical Agents

Chemical agents are substances which can injure or kill through a variety of means. Some of those we will address in this section are also identified by military classification codes which give field personnel a quick reference to their characteristics and hazards.

Chemical storage

Nerve agents are some of the most toxic known chemicals. They are hazardous in their liquid and vapor states and can cause death within minutes of exposure. Nerve agents, like their close relatives the organophosphorus pesticides, inhibit acetylcholinesterase in tissue, and their effects are caused by the resulting excess acetylcholine.

Acetylcholine is the chemical that carries nerve impulses from one neuron (nerve cell) to another. **Acetylcholinesterase** is the enzyme that removes the acetylcholine after the impulse has been transmitted to prepare the junction (synapse) to transmit another impulse. Inhibiting acetylcholinesterase will prevent this junction from being cleaned, causes continual nerve impulses resulting in convulsions and other uncontrolled muscle reactions.

Vesicants (blister agents) cause red skin (erythema), blisters, irritation, damage to the eyes, respiratory damage and gastrointestinal effects. Their effect on exposed tissue is somewhat similar to that of a corrosive chemical like lye or a strong acid.

Cyanides or **blood agents** include common industrial chemicals such as potassium cyanide, which can cause rapid respiratory arrest and death.

Pulmonary or **choking** agents include common industrial chemicals such as chlorine, which can cause eye and airway irritation, dyspnea, chest tightness, and delayed pulmonary edema.

Irritants or riot control chemicals such as pepper spray cause burning and pain on exposed mucous membranes and skin, eye pain and tearing, burning in the nostrils, respiratory discomfort, and tingling of the exposed skin.

Dissemination methods

An **aerosol** is defined as a suspension or dispersion of small particles (solids or liquids) in a gaseous medium. Aerosol dissemination methods range from hand-held spray bottles and backpack pesticide spray equipment to powered generators carried by trucks, ships and aircraft.

Area contamination, such as spraying an area with a persistent liquid chemical can cause thousands of casualties through inhalation or skin absorption.

Nerve Agents

Note: In the military classification of these nerve agents, 'G' refers to German origination and the letter following the 'G' is derived from the name of the scientist primarily responsible for developing that chemical. The letter 'V' stands for 'venom' and the 'X' following the 'V' refers to a chemical series.

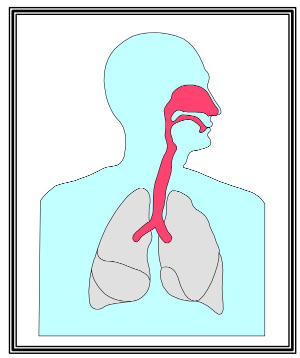
Examples of nerve agents include:

- Tabun (GA);
- Sarin (GB);
- Soman (GD);
- Thickened Soman (TGD); and
- V agent (VX).

Exposure and effects

Exposure to these agents typically occurs through exposure to airborne vapors or direct skin contact with the liquid.

Inhalation of vapor:



A small exposure to vapor can cause pinpoint pupils (miosis), runny nose (rhinorrhea) and mild difficulty breathing.

Large exposure can, in addition, cause sudden loss of consciousness, convulsions, temporary breathing stoppage (apnea), flaccid paralysis, copious secretions, and death.

Liquids on skin.

Depending on the degree of exposure, symptoms can range from localized sweating; nausea, vomiting, and a feeling of weakness to sudden loss of consciousness, seizures, breathing stoppage, copious secretions, paralysis, and death.

VX is more persistent and harder to decontaminate from the skin than the other agents listed.

Outward warning signs

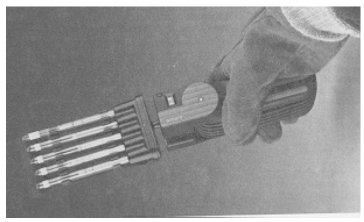
Outward warning signs include observation of symptoms such as miosis, runny noses, difficulty breathing, and uncontrolled muscles and bodily functions. Victims may possibly report a fruity odor.

Detection

Detection is by means of:

Detection papers such as M8 or M9;
Colormetric tubes;
Military detection kits;
Pesticide tickets; and
Electronic meters.

Electronic detector



Multiple colormetric tubes in a special sampling holder

Using a detection kit

Self protection

Follow your department procedures for operating at the scene of a hazardous materials incident. If the material has not been positively identified but is suspected to be nerve agent follow Guide 153 found in the North American Emergency Response Guidebook. Do not make entry into confining environments unless you have been appropriately trained and have the necessary equipment. Use time, distance and shielding to your maximum advantage. Pages 14-15 of the NAERG, include a table of placards and initial response guides for circumstances when an overall class of hazard has been identified, but not the particular substance. Guide 153 is indicated for class 6 poisons and toxins, which include the nerve agents.

Antidotes to nerve agents include Atropine and 2-PAM Chloride. See your local medical services for further information.

Vesicants (blister agents)

Note: In the classification system devised for the mustard agents, the letter 'H' is derived from the German word for 'hot stuff'. The rest of the letters should be self-evident.

Examples of vesicants include:

- Mustard (H);
- Distilled Mustard (HD);
- Nitrogen Mustard (HN1, HN2, HN3); and
- Lewisite (L);

Exposure and effects

Exposure to vesicants can be through contact with either the liquid or vapor. The warmer the climate, the more easily the vapors are produced.

As discussed earlier, both nerve agents and vessicants are liquid and must be properly weaponized by aerosolizing and/or heating in order to produce significant vapors.

The primary effects of Mustard, Distilled Mustard and Nitrogen Mustards occur in the eye, airways, and skin. Absorbed mustard may produce effects in other bodily systems.

Effects on the skin

Reddening (Erythema) is the mildest and earliest form of skin injury appearing after exposure to mustard. It resembles sunburn, and is associated with itching or a burning, stinging pain. Erythema begins to appear in 2 to 24 hours after vapor exposure.

Blistering appears later and can be quite severe.

While the nerve agents act in a manner similar to that of pesticides, vesicants act more like strong acids or caustics in their effect on the victim.

Blister agent victim from the Iran / Iraq war

Effects on the pulmonary system

The primary airway lesion from mustard is necrosis (death) of the mucosa with later damage to the musculature of the airways if the inhalation exposure is large. The common cause of death in mustard poisoning is respiratory failure.

Effect on the eyes

The eyes are the organs most sensitive to mustard vapor injury. The time between exposure and visible injury (latent period) is shorter for eye injury than for skin injury.

Effect on the Gastrointestinal (GI) tract

The mucosa of the GI tract is very susceptible to mustard damage, either from systemic absorption or ingestion of the agent. However, reports of severe GI effects from mustard poisoning are relatively infrequent.

Central nervous system (CNS) effects

The CNS effects of mustard remain poorly defined. Animal studies demonstrated that mustards (particularly the nitrogen mustards) are convulsants. There are several human case reports describing people who were heavily exposed experiencing neurological effects within several hours of exposure just prior to death. Reports from WWI and Iran described people exposed to small amounts of mustard, as appearing sluggish, apathetic, and lethargic.

Lewisite

The effects of Lewisite are similar to that of the mustards, but far more immediate. Lewisite causes immediate pain or irritation of skin and mucous membranes. Delayed symptoms, including. erythema and blisters on the skin and eye, as well as airway damage, develop later in a manner similar to that caused by the mustards. Lewisite has not been known to have been used on humans.

There is an antidote for Lewisite called The British Anti-Lewisite Cream. This is a military product, but may be available to responder organizations.

Outward warning signs

Outward warning signs include observation of blistering and other external symptoms. Victims may report an odor of garlic.

Detection methods

Detection of vesicants is similar to that of nerve agents in that you can use detection papers such as M8 and M9, military detection kits, colormetric tubes, and electronic meters.


Responder checking for chemical agents

Self protection

Follow your department procedures for operating at the scene of a hazardous materials incident. If the material has not been positively identified but vesicants are suspected, follow Guide 153 found in the North American Emergency Response Guidebook as discussed earlier. Do not make entry into confined spaces unless you have been properly trained and have the necessary equipment. Use time, distance and shielding to your maximum advantage.

Cyanides (Blood Agents)

Examples of these agents include Hydrogen Cyanide (AC) and Cyanogen Chloride (CK)

Exposure and effects

Exposure can be through contact with either liquids or vapors. Due to the high degree of volatility of these compounds, the liquid rapidly vaporizes and disperses.

Hemoglobin is the iron-based compound in the blood that carries oxygen to the cells and carbon dioxide back to the lungs for disposal. Cyanides react with the iron in hemoglobin and prevent it from properly taking up and dispensing oxygen and carbon dioxide. The effect is the same as asphyxiation, but more sudden. Symptoms are few. Exposure to high concentration, can lead to seizures, respiratory and cardiac arrest.

Outward warning signs

Outward warning signs include victims showing great difficulty in breathing and onset of cardiac symptoms. Some victims may report an odor of bitter or burnt almonds.

Detection methods are similar to those discussed earlier, including detection kits, colormetric tubes, and electronic meters

Self protection

Follow your department procedures for operating at the scene of a hazardous materials incident.

If you have positively identified the substance as Cyanogen Choride, use Guide 125.

If the material is positively identified as Hydrogen Cyanide, use Guide 117.

If a blood agent is suspected, but not positively identified, use Guide 123.

There is an antidote kit for blood agents called the Pasadena Cyanide Antidote Kit.

Pulmonary (Choking) Agents

Examples of these agents include Chlorine (CL) and Phosgene (CG).

Exposure and effects

Chlorine was the first battlefield poison gas used. Germany started utilizing it during World War I. Exposure to pulmonary agents is through inhalation of vapors. The primary effect is **pulmonary edema**. The victim's lungs fill with fluid and they develop severe pneumonia. Symptoms include eye and airway irritation, dyspnea, chest tightness, and delayed pulmonary edema.

Outward warning signs

Outward warning signs include observation of pulmonary distress among victims. They may also report odors such as chlorine, bleach or swimming pool odors (chlorine) and the odor of newly-mown hay or grass (phosgene).

Detection methods

In a manner similar to nerve agents and other chemicals, there are military detection kits, colormetric tubes, and electronic meters which will detect these agents.

Self protection

Follow your department procedures for operating at the scene of a hazardous materials incident. If the material has been identified as Chlorine, use Guide 124. If the material has been identified as Phosgene, use Guide 125. If you suspect a choking agent, but do not have positive identification, use Guide 123.

Irritants

Examples of irritants include:

- CS (tear gas);
- CR (tear gas);
- CN (mace); and
- OC (pepper spray).

Exposure and effects

Riot control agents, also called irritants, lacrimators, and tear gas, produce transient discomfort and eye closure to render the recipient temporarily incapable of fighting or resisting. Exposure is through inhalation and absorption of small smoke-like particles suspended in the air. Despite the common names, these are not gasses.

Their major activity is to cause pain, burning, or discomfort on exposed mucous membranes and skin; these effects occur within seconds of exposure, but seldom persist more than a few minutes after exposure has ended.

Outward warning signs

Outward warning signs include observation of classic 'tear gas' symptoms among victims. They may report multiple odors including hair spray and pepper due the variety of propellants used to dispense these agents.

Detection

In enclosed atmospheres colorimetric tubes can be used if implemented quickly to determine the presence of mace or pepper spray. Mace is the easiest of the two agents to detect. By using a colorimetric tube for chloroformates, mace can be detected. Colorimetric tubes for acetaldehydes can also be used. Pepper spray is more difficult but a colorimetric tube for olefin has been used successfully to determine the presence of pepper spray. The only means of positive identification is by collecting residue for laboratory analysis. Even though many public assembly points have been evacuated due to the presumed presence of irritants, identification of the specific agent is rare.

Self protection

Follow your department procedures for operating at the scene of a hazardous materials incident. If the material has not been identified or if it has been identified as either tear gas or a pepper spray, follow Guide 159 found in the North American Emergency

Response Guidebook. If mace has been positively identified, use Guide 153. Do not make entry into confined spaces unless you have been appropriately trained and have the necessary equipment. Use time, distance and shielding to your maximum advantage.

In general, self-protection from all chemical hazards follows the same principles:

Time - Keep exposure time and product contact to a minimum.

Distance - Keep an appropriate distance from the hazardous environment. Stay up wind, uphill and away from contaminated areas.

Shielding - Implement appropriate shielding in the form of respiratory protection and protective clothing.

Treatment of casualties follows the standard sequence of decontamination, patient management, transport to medical facilities (hospital), and definitive care from medical field.

Additional Resources

- Local and state resources as indicated by your plan.
- The Environmental Protection Agency (EPA).
- The Federal Bureau of Investigation (FBI).
- The Department of Defense (DOD).

Activity 4.2

School Vandalism

Purpose

In this activity, you will pull together material presented thus far in the course and will:

- Identify the outward warning signs for the case presented for this activity;
- Identify tactical considerations that may be implemented for the given student exercise;
- Identify and list specialized equipment needed to support tactical operations for the given student exercise; and
- Identify and list available technical resources outside of the local and state level that may be of assistance for the given student exercise.

Case Scenario

At 11:00 a.m. on Friday the town emergency communications center receives an emergency call from the principal at the local high school. The principal reports that there is a fire in the boys bathroom on the second floor of the two story school. All 900 students and teachers have been evacuated from the building.

The town dispatcher sends two law enforcement officers, 2 fire trucks, a ladder truck, chief officer and ambulance to the scene.

Upon arrival the firefighters notice gray smoke coming from a side door/stairwell. The firefighters enter the building with a hoseline, wearing self-contained breathing apparatus and structural fire fighting gear. When the ambulance arrives on the scene they notice multiple students are coughing, vomiting, squinting their eyes and tearing.

The two firefighters found no evidence of a fire in the boys building and immediately exit the building complaining of intense skin irritation. When they remove their SCBA, they also start complaining of burning eyes.

Activity 4.2

School Vandalism

Directions to Students

1. Listen to the directions and information presented by the instructor.
2. Working as a group discuss the case in the activity and answer the questions listed.
3. Use only the information presented in the case and material covered in this course.
4. Ask the instructor for assistance if you do not understand the question.
5. Record your responses on a flip chart.
6. Your group has 15 minutes to complete the exercise.

Questions:

1. Identify 2 outward warning signs and detection clues that are present in the given scenario.
2. Identify 2 major response challenges for the given scenario.
3. Identify the potential harm to first responders in terms of TRACEM.

Activity 4.2

School Vandalism

Questions:

4. Identify self-protective measures for first responders.

5. Identify the method for detection of the material suspected in the scenario.

6. What needs to be accomplished once you suspect that everyone in the building was contaminated.

7. List the available technical resources that may be used in this incident.

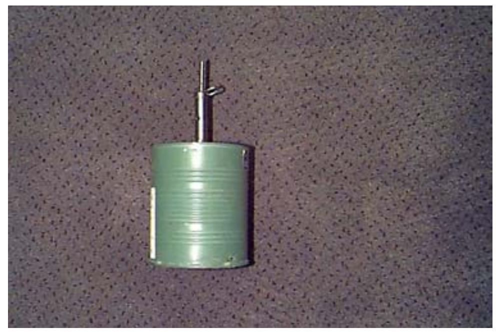
EXPLOSIVES

Introduction


Improvised Bomb

Bombs appear to be the weapon of choice for terrorists. Approximately 70% of all terrorist incidents involve the use of explosives. Improvised explosives can be designed by terrorists to deliver an assortment of harm and destruction, and can also provide a vehicle for dispersal of chemical, biological, incendiary, and nuclear agents.


Grenades


Antipersonnel mine

Terminology

Explosives are defined as materials capable of violent decomposition. This decomposition often takes the form of extremely rapid oxidation (burning). Explosions are the result of sudden and violent release of gas during the decomposition of explosive substances. This release is followed by high temperature, strong shock and loud noise.

A common method of classifying explosives is by dividing them according to the speed of their decomposition. While the terms high and low explosive are understood by most people, the correct terminology is high and low order filler materials.

When **high order fillers** are initiated, the reaction is propagated though the filler material at a speed at or above 3,300 feet per second (fps). These explosives are designed to detonate and destroy a target by a shattering effect.

When **low order fillers** are initiated, the reaction is propagated though the filler material at a speed below 3,300 feet per second (fps). These explosives are designed to deflagrate, or burn rapidly, and destroy a target by a pushing and pulling effect.

Explosive effects

Explosives, when detonated, produce three primary effects - blast Pressure, fragmentation, and thermal effects.

There are two different phases of **blast pressure**. Positive blast pressure (overpressure) moves rapidly away from the explosion center (ground zero) due to the expansion caused by the release of energy.

Automobiles damaged at the Oklahoma City Bombing site

After the positive pressure phase, a vacuum is created at the explosion site. This creates a negative pressure which moved toward the original center of the detonation at hurricane speed. It is less sudden, but lasts approximately three times as long as the positive pressure wave.

Fragmentation occurs when the explosive device propels fragments at high speed for long distances. This often accounts for many of the injuries or casualties.

Thermal Effects are sometimes referred to as the incendiary effects. Heat produced by the detonation of either high or low explosives varies according to the ingredient materials. High explosives generate greater temperatures than low explosives, however the thermal effects from low explosives have a longer duration then those of high explosives.

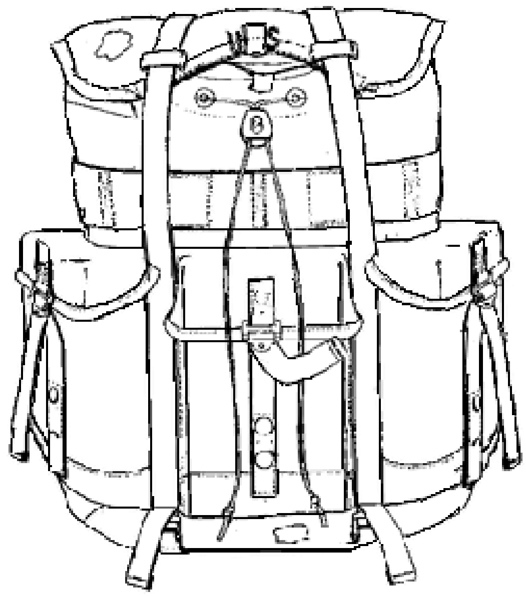
The thermal effect is visible in the bright flash or fire ball temporarily produced by an explosion. Thermal effects vary as to type of explosive, container, addition of fuels / accelerants, shielding, and proximity. Fire and thermal effects are usually localized and short-lived with conventional devices – those not enhanced for collateral incendiary effects.

Improvised explosive devices (IEDs) commonly used by terrorists

Vehicle bombs are usually large, powerful devices which consist of a quantity of explosives fitted with a timed or remotely-triggered detonator packed into a car or truck. The two most famous vehicle bombings on United States soil were the World Trade Center bombing in New York and the Alfred P. Murrah Federal Building bombing in Oklahoma City.

Pipe bombs are one of the most common explosive devices. They are at the opposite end of the scale from vehicle bombs in terms of size and destructive potential. Pipe bombs usually consist of a quantity of explosives sealed into a length of metal or plastic pipe. Detonation is usually controlled by a timing fuse. Other possible methods include electronic timers, remote triggers, and motion sensors.

Satchel device is an old military term for an explosive device consisting of a canvas overpack containing explosives. It was far more powerful than a grenade, but could still be thrown. The container may also be packed with antipersonnel materials such as nails and glass to inflict more casualties. The Centennial Park explosives incident in Atlanta is a clear example of this type of device.



Drawing of a reconstruction of the satchel believed to have been used in the Centennial Park bombing. Downloaded from the FBI Internet Site.

Other improvised explosives devices may be utilized, including homemade grenades, mines, and/or projectiles.

Explosive projectiles like rocket-propelled grenades (RPGs) have been used in the past, but have not been a common occurrence. In Fairfax County, VA, Virginia police confiscated home-made projectiles capable of exploding on contact along with tube-type launchers from a private home. This occurred after the individual who had apparently manufactured the devices was found dead in the home. The obvious danger associated with such weapons is the ability of the terrorist to take the threat from a static to a dynamic environment. The possibility of drive-by bombings will certainly increase the operational risk to responders if they are included in the target scenario.

Size-up issues

There are ten size-up issues related to responder safety during operations which we will cover here.

Disposition of the threat on arrival

Bombs that are still intact and explosive materials that have not been consumed pose extremely dangerous circumstances. The disposition of a bomb threat to the initial responder is a matter of recognizing the presenting hazards; has the bomb detonated, if so, is there a concern for dangerous remnants, are there secondary devices, etc.

Pre-blast or post-blast conditions

Pre-blast conditions refer to the affected incident environment and/or activities prior to a bomb detonating. This may include a host of activities such as, building searches, evacuations and render safe procedures.

Post-blast conditions refer to the incident environment after a bomb has exploded. This will involve issues dealing with casualties, fires and structural instability to name a few.

Size of the explosive device

The amount and type of ingredient materials will significantly contribute to the power or strength of the potential blast. Responders should consider size as an element in determining threat levels.

Proximity of exposures

The distance of exposures from the explosive device will likely influence operational objectives such as evacuations, staging locations, medical treatment areas, and perimeter control points.

Physical protection variables

Responders should consider using hardened structures such as, masonry walls and buildings (not glass), or even fire apparatus to keep responders away from potential line-of-site blast pathways (remember, stand-off distance significantly factors into selecting physical protection mediums)

Condition, location, and number and status of casualties

When responders arrive at the incident, operational priorities will be influenced by the number and severity of casualties on site. Large numbers of victims may overwhelm initial resources. Also, many types of injuries will require special medical attention. If victims are still trapped beneath rubble, specialized rescue personnel and equipment will be required.

Capabilities of resources on-hand

The degree or level of operational involvement of the responders may be predicated upon their training, equipment and in some cases experience. For example, emergency medical technicians may be limited to basic life support care with advanced care being available only from those trained to the paramedic level. Responders not trained to conduct **render safe procedures** with explosive devices would be foolish to make any attempt to do so.

Reflex / response time for technical assistance

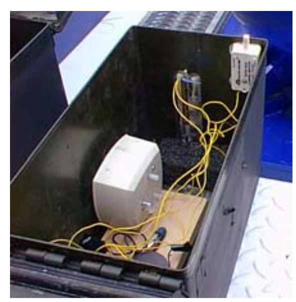
Operational decisions will be influenced by the reaction and response time it takes to get specialized resources on the scene. For those responders working a bomb incident located in a rural area, waiting two hours for a bomb disposal team to arrive may not have the same operational impact as it would on responders in the downtown section of a major city.

Commitment level of on-scene resources

Prepare for, and anticipate difficult decisions early in the response pertaining to the level of operational engagement. For example, the incident commander may elect to commit responders to rescue operations inside an unstable structure, or dedicate responders to assisting evacuees in proximity to an improvised explosive device. Decisions that commit responders to dangerous areas must include the use a hazard and risk assessment and prescribed (agency) operational procedures.

Other hazards (TRACEM)

Responders should always be aware of the potential for multiple hazards when on the scene of a bombing incident. Explosives devices may have been used to disperse chemical or radiological agents throughout the incident site, resulting in hazardous contamination of a broad area.



Improvised device designed to disperse chemical agents

Outward warning signs

Responders must remain alert at all times for warning indicators when involved with suspected bombings. Warning signs include:

- Any abandoned container out of place for the surroundings;
- Obvious devices containing blasting caps, timers, booster charges, etc.;
- Abandoned vehicles not clearly belonging in the immediate environment;
- Strong chemical odors with no apparent reason;
- Unusual or foreign devices attached to pressurized containers, bulk storage containers or supply pipes;
- Trip wires or other booby traps, suspicious mailing containers; and
- An incident preceded by a written or verbal threat.

Dogs have been trained to detect a wide variety of substances including drugs, incendiaries, and explosives.

Detection methods

Detection methods for explosive materials include the use of fluoroscopes (x-ray machines such as those used in airports), explosive-sniffing dogs and photoionization detectors.

Self protection

Follow your department procedures for operating at the scene of a hazardous materials incident. follow Guide 112 in the NAERG. Use time, distance and shielding to your maximum advantage.

Time - Work time in the effected area should be kept at a minimum until the area has been evaluated by specialized teams. Teams will search the area for mechanical hazards, unexploded material, radiological hazards, chemical hazards, biological hazards, secondary devices and booby traps.

Distance - Guide 112 in the NAERG provides some guidance when dealing with possible unexploded materials. It also suggests not permitting radio transmitters (which include cellular phones) within 100 meters (330 feet) of any suspected device.

Shielding - If practical, keep out of line-of-sight of any suspected devices. Buildings and vehicles may provide some protection.

Treatment of casualties

Treatment of casualties follows the standard sequence of decontamination, patient management, transport to medical facilities (hospital), and definitive care from medical field.

Crime Scene Considerations

Responders should remain aware that they are also at a potential crime scene, and should be alert for secondary events and/or devices designed to target responders. Responders should not handle, disturb, or move suspicious devices, packages, or objects. Mark the location and report to the incident commander.

Evidence preservation is an important part of crime scene operations. Do not disturb or damage potential evidence. When you remove clothing from victims, remember that they may contain evidence which may be recovered. Identify and bag all such materials for laboratory analysis.

Seek technical assistance to manage all devices!

Additional Resources

- Local and state resources as identified in your plan.
- Bureau of Alcohol, Tobacco and Firearms (BATF).
- Federal Bureau of Investigation (FBI).
- Department of Defense (DOD).

SUMMARY

Emergency responders must be alert for and recognize *outward warning signs* associated with B-NICE events to maximize scene safety during tactical operations. The initial incident evaluation (size-up) should include as much relevant information as possible to support development of tactical considerations. Relevant information may include pre-event written and verbal threats, dispatch information, target hazard pre-plans and most importantly, the presenting conditions on arrival to the scene. When responders arrive on-scene the size and complexity of the event will greatly limit the number of tactical options to consider. The training level of responders and equipment capabilities will also factor into making operational decisions. As more resources arrive, additional options will likely become available. Technical resources must be requested early in the incident to reduce response *reflex times*. Deciding which tactical operation to employ after appropriate resources are available will be influenced by the ability of responders to protect themselves through *time, distance and shielding.* One final consideration that must be taken into account prior to initiating tactical operations is ensuring that preparations are in-place for emergency decontamination and continuous patient management (up to hospital delivery). As with any emergency selecting and implementing the best tactical options will usually dictate the success or failure of the response effort.

MODULE 5:
INCIDENT MANAGEMENT OVERVIEW

TERMINAL OBJECTIVES

The students upon completion of this module will be able to describe command and control issues associated with responder operations at a crime scene.

ENABLING OBJECTIVES

The students will:

1. *Describe and define the authorities and responsibilities in Presidential Decision Directive 39.*

2. *Identify crime scene issues which must be addressed when managing an incident involving potential criminal activities.*

3. *Define applicable resources referenced in the Federal Response Plan (FRP) and the FRP Terrorism Annex.*

4. *Identify the preliminary indicators for transition from emergency phase to recovery and termination.*

5. *Define unique debriefing and security issues.*

THE CHALLENGE FOR INCIDENT COMMAND

Terrorism, whether it involves biological, nuclear, incendiary, chemical, explosives, or combinations of these elements, is more challenging to manage than most emergency events.

Coordination of multiple response agencies

The **Incident Commander** (IC) must ensure that all participating agencies are effectively communicating within the designated command structure.

Regular planning sessions should be conducted to review the progress of assigned tasks and to incorporate new resources as they engage or disengage from the incident.

When multiple agencies are operating on-site, the IC must request or appoint a representative or liaison for each.

Unique scene control / security issues

On-going criminal activities will likely impact scene control initiatives. Police may limit or restrict access to the scene due to security concerns.

Due to the dynamic nature of criminal activity, anticipate that the incident perimeter will be larger than would be expected simply due to the incident scope.

Special awareness, that responders may be the intended target

Consider that terrorists may still be on the scene, waiting for responders to arrive. The intent could be to add responders to the victim list.

Specialized resources

Terrorist events will generate responses from many agencies. Some of the response teams will provide personnel who are specially trained and equipped to support operational objectives. Examples include the FBI Hazardous Materials Response Unit and law enforcement bomb disposal teams.

Police bomb squad

Crime scene considerations (evidential preservation)

Responders working in the confines of a crime scene must respect the mission of law enforcement investigators. Assist that mission by identifying and preserving potential evidence whenever you encounter it.

THE ROLE OF THE INCIDENT COMMANDER AT TERRORIST EVENTS

The Incident Commander must safely, effectively and efficiently manage response resources to achieve the most favorable incident outcomes possible.

Follow the SEE Principle

Safe - No one gets hurt.
Effective - Everyone works toward stated objectives.
Efficient - All resources are utilized to maximum benefit.

Management of the incident is based on three components

1. **Establishing and updating priorities** is a broad topic that covers a variety of factors. These include life safety, incident stabilization, property and environmental conservation and the investigation of cause and origin.

2. **Continually size-up** both the present situation and the predicted behavior of the incident.

3. **Establishing and updating incident priorities** is different in that it is narrowly focused on the strategic goals, tactical objective, and task operations. Another way of putting it would be to say that establishing and updating incident priorities focuses on what needs to be done, how it will be done, and who and when will do it.

Incident Command responsibilities

Incident command covers a broad scope. Some responsibilities may include, but are not limited to:

INCIDENT COMMAND RESPONSIBILITIES	

Command and control issues

Command and control issues at terrorist incidents will likely involve a unified command system in order to properly coordinate the various agencies and authorities involved in responding to the incident. Some key agencies may include local fire/EMS, law enforcement and emergency management. State or territorial law enforcement and emergency management may also become involved.

If federal involvement is required, the two lead agencies are the Federal Emergency Management Agency (FEMA) and the Federal Bureau of Investigation (FBI).

RESPONSIBILITIES AS OUTLINED IN PRESIDENTIAL DECISION DIRECTIVE -39 (PDD-39)

PDD-39 identifies the **Federal Bureau of Investigation** as the lead agency for crisis management during terrorist incidents involving nuclear, biological and chemical materials.

It also identifies the **Federal Emergency Management Agency** as the lead agency for recovery and consequence management during terrorist incidents involving nuclear, biological and chemical materials.

PDD-39 supports either type of management activity, as well as unified command operations when more than one agency shares the lead.

Technical support and response assistance

PDD-39 outlines technical support and response assistance insofar as it supplements both crisis and consequence activities. It also complements product identification, detection, monitoring and assessment of the agent or material, as well as management and disposal of same.

Relationship between PDD-39 and the Federal Response Plan

The Federal Response Plan (FRP) is used as the vehicle to coordinate consequence management efforts under PDD-39. The plan directs other Federal agencies to support the FBI and FEMA as needed.

THE FOCUS OF LOCAL GOVERNMENT RESPONSE PLANS

The focus of local governmental response should fall into five specific areas.

1. **Public protection** is obviously the primary priority for all response plans.

2. **Emergency services** need to be addressed as well. Specific areas of emergency services needing attention by a local response plan include:

   - Search and/or rescue;
   - Basic and advanced life support medical care; and
   - Hazard isolation / incident scene control.

3. Once the emergency services are assured, **restoration of critical public systems**, including electric / gas utility service, water supply, wastewater treatment, and usable transportation corridors.

4. The fourth area which a local plan should address is **field assessment** capabilities to determine additional resource needs.

5. Finally, the plan should address how and when to declare a local disaster / emergency.

STATE AND TERRITORIAL GOVERNMENT RESPONSIBILITIES

The state or territorial government has responsibilities that fall into six categories.

1. Provide support personnel, equipment and supplies;

2. Provide specialized resources;

3. Provide National Guard support;

4. Provide field assessment capabilities to determine additional resource needs;

5. Issue state declaration of emergency; and

6. Request Federal assistance.

THE FEDERAL RESPONSE

The **Federal Response Plan** (FRP) is a written agreement among various departments and agencies that coordinates government resources and federal activities for response to disasters, as part of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. It also augments state and local government response efforts during declared emergencies and disasters, which includes response, mitigation and recovery assistance.

Activating the Plan

There are three different way in which the FRP may be activated.

1. The Governor of the affected State request Federal assistance.

2. A significant emergency or disaster overwhelms local and State response resources and the President initiates a declaration under the Stafford Act.

3. A major event has been forecasted (e.g., hurricane) and Federal assistance will likely be needed.

Resources Available

The following is a partial list of support components and resources available for terrorist incidents at the Federal level:

1. **Department of Justice (FBI)**

    a. Local Field Office.

    - Special Agent In Charge (SAIC)
    - Evidence Team (ERT)

    b. National Resources.

    - Critical Incident Response Group (CIRG)
    - Laboratory services
    - Bomb Management Center (with BATF)

2. **Federal Emergency Management Agency (FEMA)** / Response and Recovery Directorate.

   a. Functions:

   - Disaster and Emergency Declarations;
   - Damage Assessment;
   - Response Operations;
   - Recovery Operations;
   - Federal Planning;
   - State and Local Planning;
   - Regional Planning;
   - Military Liaison;
   - Response Teams;
   - Evaluation;
   - National Security; and
   - Field Operations.

   b. Programs:

   - Federal Response Plan;
   - Individual Assistance;
   - Public Assistance;
   - Continuity of Government (COG) Planning;
   - National Disaster Medical Services;
   - Urban Search and Rescue;
   - Mobile Emergency Response System (MERS) Units;
   - Operations Centers; and
   - Mobile Air Transportable Telecommunications System (MATTS).

3. **Treasury Department (BATF)**

4. **Department of Energy (radiological expertise)**

5. **Department of Defense**

   a. Chemical and Biological Defense Command (CBDCOM).

   b. Army Technical Escort Unit.

c. U.S. Army Medical and Material Command (USAMRMC).

- U.S. Army Medical Research Institute of Chemical Defense (USAMRIC).
- U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) .

d. USMC Chemical Biological Incident Response Force (CBIRF).

e. US Naval Medical Research Institute (NMRI).

TRANSITIONING FROM THE EMERGENCY PHASE TO RECOVERY AND TERMINATION

Transitioning is determined by the stability of the incident or threat level. Factors which assist in this determination include:

- Resolution of criminal activity;
- Control of chemical agents, materials, devices and conditions that may harm responders, civilians and further impact the community; and
- Restoration of critical (community) systems to an acceptable operational level.

Recovery Operations

Returning the affected community back to normalcy (pre-incident conditions) remains the primary focus for recovery operations. What may be unique regarding terrorist incidents and recovery is who becomes responsible for directing this phase of operation. Identification of the individual or agency responsible for directing recovery is based upon many factors. The **Terrorism Annex** to the FRP provides guidance in this area.

On-going crime scene investigations will likely place law enforcement as the responsible command lead.

Regardless of the command lead, resources involved in the recovery phase must establish regular planning sessions to address oversight of the affected operational area and restoring response resources to a state of readiness. Significant terrorist incidents will likely increase the duration of recovery operations. This is primarily due to the complex nature, and/or unfamiliarity of responders in dealing with the consequences, agents and/or devices (weapons) of mass destruction.

Any act of terrorism that has caused death and destruction, or driven people from their homes will likely require a well conceived community recovery plan. You should consider the following as components of that plan:

- A focused source of information that will instruct evacuees on how and when to return home;
- Status reports of incident recovery operations and planned events;
- Information about areas that are still cordoned-off or restricted and why;
- Any other incident related details that will provide a sense of security, or enhance a return to "normalcy", provide points of contact for the community to ask questions; and
- Establishment of a counseling center(s) for community use.

Termination of the Incident

Termination procedures include debriefing all response resources, formal and informal critiques of response activities and after- action adjustments to enhance future operations for a similar type of incident.

For terrorist incidents, **debriefing sessions** are especially important to responders that are unfamiliar with weapons of mass destruction. Authorities should recognize the potential for psychological impacts for several reasons. One is that most responders are not used to dealing with chemical and biological warfare agents. Dealing with the unknown is always more stressful than handling known hazards. Responders may have been the intended target, which will make the incident far more personal than otherwise. Also, concerns about continued or secondary exposure may facilitate post-incident stress.

Remember that Occupational Safety and Health regulations require the incident commander to provide each responder with information relating to hazardous exposure concerns e.g., agent identification, decontamination actions and potential symptoms.

When conducting the debriefing session include incident features that were unique to the response. Discuss the effectiveness of operational activities and provide an overview of how the response influenced the emergency, and whether strategic goals were achieved. Also, discuss what response resources were involved with the incident, and the associated responsibilities during the emergency.

Accurate documentation is a critical factor to determining the eventual resolution of a terrorist incident. This documentation should also be utilized to modify and enhance future response procedures.

Incident Critique

Evaluating the response and performance of resources after a terrorist event should be consistent with standard incident critique procedures. However, there are special considerations that may require attention.

You may wish to consider the appointment of more than one **lead agency** to conduct the critique, and coordinate sharing joint responsibility with all participating agencies regarding collection of post-incident information.

Establish a system with **law enforcement** officials for scrutinizing information that may be sensitive to investigative proceedings.

Emphasize the importance of carefully recording **accurate information** for post-incident reporting, remember that all documentation, including photographs, videotapes, audiotapes and computer files is subjected to evidentiary summons.

SUMMARY

Command personnel who are responsible for managing response resources at a terrorist event must implement and strictly adhere to the principles of an incident management system. Initiate actions early to gain control of the emergency. Remember, not unlike other significant incidents, strong command and control techniques will foster scene safety. Recognize the need for, and effectively utilize specialized resources. Good planning will incorporate crime scene considerations as well as effective communications among all response organizations. Be prepared in advance of the event by becoming familiar with local, state and federal response plans and agencies.

The balance of this course will consist of a comprehensive activity and a written exam.

Activity 5.1

Comprehensive Response

Purpose

This activity is designed to combine elements of terrorism response presented throughout the course. In this final activity, you will be expected to:

- Recognize and describe possible indicators of terrorism;
- Implement appropriate self-protective measures;
- Initiate appropriate scene control measures;
- Describe basic tactical considerations; and
- Provide an incident management overview covering resources and authorities.

In your student manual, you will find an instruction sheet, background information and three activity sheets. The first activity sheet covers initial response through size-up. The second sheet covers on-scene basic tactical operations and the third an incident management overview. All the information you need is in your student manual.

Directions to Students

1. Review the background information concerning Collegetown.

2. In your small group, review the material presented on Activity Sheet 1: Initial Response

3. Record your responses to each question on a flip chart.

4. Review the material presented on Activity Sheet 2: Continuing Operations.

5. Record your responses to each question on a flip chart.

6. Review the material presented on Activity Sheet 3: Transition to Recovery and Termination.

7. Record your responses to each question on a flip chart.

8. Select one or more individuals from your group to present your findings.

Activity 5.1
Comprehensive Response
Collegetown, U.S.A.

BACKGROUND INFORMATION:

Population:

Collegetown has a permanent population of 40,000 and a transient student population of 10,000.

Law Enforcement:

City department.

- Four patrol officers and one supervisor on duty.
- All personnel trained at the hazmat awareness level.

Campus security.

- Three security guards on duty.
- All trained at the hazmat awareness level.

Fire / EMS Capability:

Fire/EMS Department:

- Four stations.
- One Battalion Chief on duty.
- All personnel trained to hazmat operations level.
- All chief officers trained in hazmat incident command.
- All Station Three personnel trained to hazmat technician level.
- Heavy Rescue Squad trained to hazmat technician level.
- One hour recall for 54 off-shift personnel.

Station One houses one engine, one ladder truck and one basic life support unit.

Station Two houses one engine and an advanced life support unit.

Station Three houses one engine, one advanced life support unit, one offensive hazmat unit and a chief.

Station Four houses one engine, one heavy rescue squad and a basic life support unit.

Medical / Hospital Services:

City hospital.

- 60 bed capacity.
- Emergency room.
- Decon plan.
- Properly trained.

College infirmary.

- 10 bed capacity.
- One RN on duty.
- No special hazmat training.

ADDITIONAL RESOURCES:

Mutual Aid and Additional Local Assets: Response Time 30 min.

- Ten police units.
- Six engines.
- Two ladder trucks.
- One hazmat unit with six technicians.
- Ten ambulances.
- Two chief officers.

Additional Resources - Response Time 60 min.

- Fifty state police.
- State hazmat team with twenty technicians.
- State emergency management personnel.
- Local FBI Office.

Additional Resources - Response Time 4-6 hours.

- National Guard.
- Specialized federal assets.

Activity 5.1
Comprehensive Response
Sheet 1: Initial Response

SCENARIO

At 10:00 AM, your jurisdiction receives an emergency call reporting an explosion with injuries at the college. The explosion is reported to have occurred in the auditorium building where 500 students were attending a lecture.

While enroute, additional emergency calls are received from the scene reporting unspecified illnesses among victim.

The first arriving units report several hundred students fleeing the vicinity of the auditorium building. Several victims are down in the parking lot near the auditorium suffering from convulsions and/or seizures. There is no apparent structural damage to the building and no sign of fire.

QUESTIONS:

1. Identify the key indicators that this may be a terrorism event.

2. Identify the potential types of harm to responders (TRACEM).

3. Identify appropriate self-protective measures for responders.

Activity 5.1
Comprehensive Response
Sheet 2: On-scene Basic Tactical Operations

SCENARIO

It is now 45 minutes into the incident.

Questions:

1. Identify appropriate scene control measures.

2. Indicate scene security measures taken.

3. Identify outward warning signs and detection clues.

4. Identify the type of event (B-NICE).

5. List any other significant tactical considerations.

Activity 5.1
Comprehensive Response
Sheet 3: Incident Management Overview

Questions:

1. Identify four incident management issues.

2. Identify four considerations for operating at a criminal event.

3. Identify federal command authorities for this incident as identified in PDD-39.

4. Identify applicable resources as referenced in the Federal Response Plan.

APPENDIX A

ARTICLES FROM THE SECURITY AWARENESS BULLETIN

The articles in this appendix first appeared in the Security Awareness Bulletin, Number 3-96, December, 1996. The Security Awareness Bulletin is produced by the Department of Defense Security Institute in Richmond, Virginia.

Their Internet site is: http://www.dtic.mil/dodsi

Antiterrorism Awareness: Changing the Mindset

A renewed challenge for the security educator

by Lynn Fischer, DoD Security Institute

The major focus on this issue of the *Security Awareness Bulletin* is antiterrorism and specifically what the security educator in defense components and industry should be conveying on this subject to the employee or service-member population. The articles included here may be useful as reading material, particularly for personnel who are relatively more vulnerable to a terrorist attempt. And these texts could serve, in content and structure, as the basis for special-focus security briefings for all personnel. With the rash of domestic terrorist incidents, we are moving away from the idea that it's just people who go overseas to high risk areas who need a thorough exposure to personal protection measures and antiterrorism (AT) awareness information. Both policy and common sense dictate that general AT awareness be a standard element in security indoctrination for Department of Defense personnel.

Timely guidance

In the wake of two devastating terrorist bombings in Saudi Arabia (Riyadh in November 1995 and Khobar Towers in June 1996), Secretary of Defense William J. Perry has reissued DoD Directive 2000.12, "'DoD Combating Terrorism Program" dated September 15, 1996. This directive has a lot to say about security education in support of antiterrorism programs. As does the earlier directive by the same title, it tasks military department and other defense components to institute antiterrorism awareness programs. It states that attention must be given to: "elevating the awareness of DoD personnel and their families to (a) the general terrorist threat, (b) the terrorist threat in their areas (including temporary duty and/or temporary active duty and leave areas), and (c) personnel protection measures that can reduce personal vulnerability."

What is specifically new about the directive, as described by Dr. Perry, is that the approaches previously set forth as suggestions in DoD Handbook *0-2000.12-H, Protection of DoD Personnel And Activities Against Acts of Terrorism and Political Turbulence,* are now to be implemented as the DoD standard that shall apply to all antiterrorism (AT) force protection efforts.[i] Although currently in revision, the handbook offers a wealth of information that can be incorporated into briefings and awareness publications including personal protection tips for travelers that can reduce personal vulnerability.

A response to the bombings In Saudi Arabia

We can find additional guidance for strengthening the AT element in our security awareness program in both (1) the language of the final report of the Antiterrorism Task Force following the bombing at Riyadh and (2) in the *Downing Report* which assessed the Khobar Towers tragedy.[ii] The earlier report dated May, 1996, states "The entire training program requires new reinforcement, command emphasis, and innovated media methodologies to aid in fulfilling the basic AT training programs. The major challenge noted has been combating complacency—thus making 'changing the mindset' a fundamentally important objective."

The report goes on to say that while sustaining AT focus is difficult despite the training and briefings now being accomplished, "Security consciousness is not adequately emphasized and resource expenditures do not fully support programs. Without continued command emphasis, other problems such as training and program awareness, limited resources, competing priorities, and perceived absence of threat--will endure."

The task force report concludes with several recommendations related to security education that will lead to a DoD AT program of excellence. It endorses the Annual Worldwide AT Conference to consolidate, evaluate, and cross-fertilize AT enhancements; stresses the importance of command support and leadership emphasis required to energize AT training as part of force protection; and identifies the need for specific training actions and educational products for AT awareness. This includes the distribution of a video, now under development by the Joint Staff, a commander's antiterrorism handbook, a personal protection pamphlet for use throughout the Department of Defense, and an AT-Force Protection Card to be used as a personal reminder. Plans are underway by the Joint Staff for the printing and distribution of the following three publications through major military command headquarters.[iii]

These publications are authorized for local reproduction within the Department of Defense:

- *Coping with Violence***,** a Personal Protection Pamphlet
- JS Guide 5260, *Service Member's Personal Protection* Guide: *A* Self-Help *Handbook* to *Combating Terrorism*
- *Security While Traveling,* a tri-fold card with tips about individual protection measures

The need for theater-specific training

The recently-released *Downing Report* (September 1996) reinforces the conclusions of the previous assessment and calls for greater "theater-specific training guidance" for personnel deployed in the command's area of responsibility. Consequently four recommendations were made by the Downing, task force which were immediately accepted by the Secretary of Defense for implementation:

a. Establishment of AT training qualifications and certification -procedures for all units and individuals prior to deployment and after arrival in an area of responsibility

b. Mandatory force protection and risk management training for all officers and senior noncommissioned officers deployed to high areas

c. Development of antiterrorism training and educational supporting materials, using innovative media methodologies

d. Refresher training for installation/unit AT officers immediately prior to assignment to a theater

While items a, b, and d concern resident or formal training for higher risk personnel, item c is a direct follow-up to the earlier Antiterrorism Task Force recommendation for AT awareness that calls for a variety of innovative educational products. In his comments to the President which accompanies the Downing Report on the Khobar Towers bombing, Secretary Perry states in addition that local commanders will have operational and full responsibility with regard to force protection matters, and that the Chiefs of Staff has become the principal advisor and focal point for all Department of Defense force protection activities.

Add AT awareness to the educational agenda

The new emphasis on antiterrorism training and awareness demonstrates again that the skills and energies of security educators are indispensable in confronting a international threat to U.S. lives and properties. In the words of the *Task Force Report,* awareness programs should be mobilized to battle complacency and to change the mindset that: "It can’t happen to me" or "It can't happen here." This is admittedly a weighty task for the security educator already charged with the indoctrination of personnel concerning information security, personnel security, foreign threat awareness, and other educational objectives.

However, as with awareness programs to confront the threat to national defense information, AT awareness can and ought to be a community effort in which we draw upon the products, ideas and methodologies of security educators who have the resources to generate effective training materials. We at the DoD Security Institute, the Office of the Joint Chiefs of Staff, and others who are involved in the production of awareness publications, videos, posters and other training aids will do our utmost to advertise and disseminate timely threat information and products to support your educational programs. Keep tuned to the *Security Awareness Bulletin* and to our Web Page for up-to-date information and training products: http://www.dtic.mil/dodsi/.

Keeping current on the terrorist threat

The intensity of the terrorist threat not only differs from place to place but changes across time. Part of the job of the security educator is to remain current about new and intensified threat areas by keeping up to date on Travel Security Advisories (TSA) issued by the Office of the Secretary of Defense, and other sources of current information on the terrorist threat such as the Department of State and the Defense Intelligence Agency. On the next page are sources of information, in printed form and via the Internet to keep your awareness communications to employee populations timely and accurate.

Terrorist Intelligence Operations

Introduction

This article assesses the threat posed by terrorism to the United States and examines the role that OPSEC plays in protecting U.S. interests against terrorist attack. In testimony before the House Judiciary Committee in April 1995, Admiral John O. Studeman, the Acting Director of Central Intelligence, summarizes the terrorist threat to the United States in the following manner:

International terrorism remains one of the deadliest and most persistent threats to U.S. security. The motives, perpetrators, and methods of the terrorist groups are evolving in ways that complicate analysis, collection, and counteraction and require the ability to ship resources flexibly and quickly. The rise of the new breed of terrorist who is interested in inflicting mass death and destruction does not bode well for the future security of U.S. interests. These groups can strike at any time, anywhere, spurred by seemingly unrelated events for which they judge the United States to be blameworthy. They have a widening global reach and a high degree of proficiency with more sophisticated weapons and tactics.[iv]

Terrorism is defined as the unlawful use of force or violence against persons or property for the purposes of intimidating or coercing a government, the civilian population, or any segment thereof, intolerance of political and social objectives. There are two categories of terrorism: domestic and international. Domestic terrorism involves groups or individuals whose activities, conducted in the United States without foreign influence, are directed at elements of the United States Government or population. International terrorism involves activity committed by foreign based groups or individuals who are either directed by countries or groups outside the United States or whose activities transcend national boundaries.[v]

Terrorist group categories

Terrorist groups generally are either non-state supported (either indigenous or transnational), state-supported, or state directed. Non-state supported terrorist groups are autonomous and receive no significant support from a government. State supported groups generally operate independently but receive support from one or more governments. Such support may include weapons, training, money, intelligence, or safe havens. State-directed terrorist organizations act as agents of a government. Such groups receive intelligence, logistics, and operational support from the sponsoring government, frequently through diplomatic missions. State-directed terrorism is potentially a deniable and/or relatively inexpensive method of carrying out attacks against an enemy state or its interests.[vi]

The greatest terrorist threat to the United States today comes from fundamentalist Islamic extremist groups. Some of these groups, such as the Party of God (Hizballah), the Palestinian group Islamic Resistance Movement (HAMAS), and the Algerian Armed Islamic Group fit the traditional terrorist mold. These groups have hierarchical structures and receive support from state sponsors. A new Islamic threat is on the rise as a result of the activities of ad hoc terrorist groups. These groups are even more dangerous in many ways than the traditional groups because they lack a well-established organizational identity, and they tend to decentralize and compartment their activities. They are capable of producing sophisticated conventional weapons, as well as chemical and biological agents. They are also less constrained by state sponsors or other benefactors than more traditional terrorist organizations. These new groups seek to punish the United States and other Western nations by inflicting heavy civilian casualties. The World Trade Center bombers are prime examples of this new breed of radical, transnational Islamic terrorists.[vii]

Both the traditional groups and the newer, ad hoc groups have increased their capability to attack U.S. interests. The groups are well funded, and some have developed sophisticated international support networks that provide them great freedom of movement and increase their opportunities to attack the interests of the United States on a global basis. These groups are also attracting more qualified cadres with greater technical skills. Several groups have established supporting infrastructures within the United States that provide financial, logistics, operational, and intelligence support.[viii] Although, there is no evidence that these groups are centrally coordinated, it does appear that they collaborate in terrorist actions. Evidence gathered by Federal investigators in the World Trade Center bombing case, for example, shows that leaders or representatives of five different groups - the Palestinian Islamic Jihad, HAMAS, the Sudanese National Islamic Front, the Pakistan-based al-Fuqrah, and groups funded by Persian Gulf donors - were involved in the plot. The conspirators were aided by Sudanese diplomats affiliated with the National Islamic Front, which provided them with information and credentials. Evidence seized later from the apartment of one of the conspirators revealed detailed intelligence on potential targets and plans for other attacks in the New York area.[ix]

Terrorist tactics

There are six basic types of tactics that terrorist groups have used: hijackings, kidnappings, bombings, assassinations, armed assaults, and barricade-hostage incidents. A group's objectives and organizational capabilities dictate which tactics it uses. Terrorist organizations typically use hijackings, kidnapping, and barricade-hostage incidents when the group wishes to force the targeted company or government into negotiations. The terrorist group frequently is able to obtain the release of prisoners or extort money. Such incidents increase the level of risk to the terrorist organization and require a mature planning, operations, logistics, and intelligence capability to successfully conduct the operation. Bombings, assassinations, and armed assaults are less risky and generally require less organizational capabilities. These tactics tend to be used to accomplish the following goals:

- Create a climate of fear in a targeted group or nation through a sustained campaign of violence;
- Retaliate for previous incidents or situations affecting the terrorist organization or its causes;
- Negatively affect processes that the terrorist organization sees as against its interests; and
- Eliminate specific individuals or groups.[x]

Attaining the terrorist organization's goals depends on receiving adequate information for planning and executing an operation. OPSEC denies terrorist organizations the information they require for planning. The following portions of this section discuss the terrorist threat to the United States and the role of sponsoring nations and terrorist organizations in executing attacks.

Terrorist objectives

Organizations intend their terrorist activities to have an emotional impact on the target audience, causing it to act in a manner that furthers the group's objectives. Terrorist operations generally are categorized in terms of their associated goals. These goals traditionally are divided into five categories: recognition, coercion, intimidation, provocation, and insurgency support. Early in their life span, terrorist groups often carry out attacks designed to gain recognition. The objective of these attacks is national and/or international attention for the group and its stated objectives. Groups often mount such attacks, which may involve protracted hostage seizures, against highly-visible symbols of state control (e.g., national airlines). Groups intend coercion attacks to force individuals, organizations, or governments to act in a desired manner. Using this strategy, terrorists selectively target facilities with the intent of bringing increasing pressure to bear on the targeted activity. Terrorist attacks designed primarily to intimidate are a means of preventing organizations or governments from acting in a defined manner. Provocation attacks aim to force government security forces to take repressive action against the general populace. These attacks generally are against critical infrastructures, popular or high-profile individuals, or important facilities. The goal of these attacks is to demonstrate the weakness of the legitimate government, thus causing an uncoordinated backlash.[xi]

Terrorist threats to the United States

Until recently, many people believed that the United States was largely immune to terrorist attack. This belief was based on the low number of terrorist attacks that took place in the United States during the 1980s and early 1990s. The bombing of the World Trade Center on February 26, 1993, demonstrated the nation's vulnerability to terrorist attack. In retrospect, however, there was no reason to discount U.S. vulnerability to terrorist attacks. Historically, the United States has been the target of over 32 percent of all terrorist attacks worldwide, second only to Israel. Domestically, the United States averaged 100 terrorist attacks per year in the 1970s, with 112 occurring in 1977 alone. Between 1980 and 1982, 122 terrorist attacks occurred in the United States with 51 of these attacks occurring in 1982. Between 1982 and 1993, a total of 177 confirmed terrorist incidents and 46 suspected terrorist incidents took place. Additionally, law enforcement intervention prevented 81 terrorist incidents, many of which could have resulted in extensive damage to property or significant loss of life. Superior intelligence collection and the infiltration of terrorist groups with informers enabled the Federal Bureau of Investigation, in concert with the Intelligence Community, to prevent these attacks. However, if terrorist groups continue to evolve into more informal, ad hoc structures, gathering information necessary to prevent terrorist incidents may become far more difficult.[xii]

It is likely that the number of terrorist attacks taking place inside the United States will increase within the next several years. According to current projections, worldwide terrorism will increase at a rate of roughly 15 percent per year - a figure in line with historical patterns. Most terrorist attacks against American interests will still occur overseas, but more violent attacks aimed at symbolic targets and vital infrastructure are likely to occur inside the United States. Both domestic and international terrorism are likely to increase. Moreover, as terrorists gain technical skills and attempt to stay one move ahead of counterterrorist and antiterrorist forces, the weapons and operational techniques used by terrorists are likely to grow more complex and more sophisticated.[xiii]

Terrorist sponsors

The Department of State currently considers seven countries to be terrorist sponsors: Libya, Syria, Iran, Cuba, Sudan, Iraq, and North Korea. [xiv]

Libya

Although it has made some cosmetic changes to its terrorism apparatus, Libya retains the capability to commit terrorist acts. Despite its public renunciation of terrorism, terrorism remains an important instrument of Libyan foreign policy, which is managed at the highest levels of government. The United States has successfully sought sanctions against Libya in the United Nations aimed at forcing the execution of the two Libyan intelligence officers implicated in the bombing of Pan American flight 103. However, Libya has still failed to comply with the demands of the U.N. Security Council for the execution of these individuals as well as those suspected to be involved in the bombing of UTA flight 772. In December 1993, the Security Council increased sanctions against Libya to compel compliance. While it has closed some terrorist facilities, Libya still provides safe havens and financial support for the Abu Nidal Organization (ANO) and other terrorist groups. In October 1993, Qaddafi vowed to strike the United States and nations supporting U.N. sanctions against Libya. It is believed that Libya possesses chemical weapons and is actively pursuing other weapons of mass destruction.[xv]

The primary Libyan intelligence organization, the Jamahariya Security Organization (JSO), has been directly implicated in the bombing of Pan American flight 103 and UTA flight 772. The bomb used to destroy Pan American 103 was traced to a station manager for Libyan Arab Airways in Malta. The station manager, a JSO Intelligence officer, checked the bag at Luqa Airport in Malta on to a KLM aircraft flying to London with instructions for transfer to a flight for John F. Kennedy International Airport in New York. Because of his position, the Libyan station manager was able to bypass airport security and forward the suitcase with the bomb without any examination. Authorities in London placed the bag on the next flight to New York, Pan American 103, assuming that it has been checked and determined to be safe in Malta. A defector from the JSO to the United States provided critical information on the role of Libyan intelligence in the bombing of the aircraft. [xvi]

The JSO was also responsible for planning and executing the LaBelle Discotheque bombing in Berlin, Germany which killed U.S. Army personnel in 1986. On December 4, 1992, the Federal Republic of Germany indicted two Libyan intelligence officers for their role in the bombing. The Libyan Embassy in East Germany provided the explosives used in the bombing and collected intelligence needed to target the nightclub. The JSO has also been directly implicated in the attacks by the ANO on the Rome and Vienna Airports in 1985. Libya provided forged passports and intelligence support, and used diplomatic pouches to move weapons into the vicinity of the attacks. The JSO was also involved in the attempted assassination of a U.S. ambassador in 1977. Libyan People's Bureaus throughout the world have been used to provide monetary support, weapons, training, and intelligence to disparate terrorist groups sponsored by Libya. The Libyans have also used front companies, the offices of Libyan Arab Airlines, and the Islamic Call Society as covers for intelligence and terrorist operations. The Libyans have also used these activities to obtain embargoed technologies and information for their program to produce weapons of mass destruction.[xvii]

Syria

To advance its interests in the Middle East, Syria has used terrorism as an integral part of its foreign policy. Syrian intelligence officers and diplomats have been associated with attacks on Jordanian officials and Syrian dissidents living abroad. In January 1986, the Syrian intelligence service was behind a plot to smuggle a bomb through the United Kingdom's Heathrow Airport onto an El Al aircraft. Since the end of 1986, Syrian sponsorship of terrorist activities appears to have been restricted to the Middle East. Syrian intelligence is also involved in the diversion of technologies required for the manufacture of weapons of mass destruction, and for advanced conventional munitions. It is believed that Syria possesses chemical weapons and is developing the capability to produce biological weapons. Syria continues to provide safe haven, training, financial support and perhaps intelligence support for a number of Middle East terrorist organizations. These organizations include the Palestine Islamic Jihad (PU), the Popular Front for the Liberation of Palestine General Command, Hizballah, the Japanese Red Army, and HAMAS.[xviii]

Iran

Iran is the most active sponsor of terrorism in the world. Since the inception of the Islamic state in 1979, the country has used terrorism as an integral part of its foreign and military policies. Iranian leaders view terrorism as a valid tool to accomplish their political objectives. Terrorist operations are reviewed and approved at the highest levels of the Iranian government, and the President of Iran is involved in the approval process of all major terrorist operations. Iran-sponsored terrorism has had two major goals: punishing opponents of the Islamic regime and expanding the Islamic movement throughout the Persian Gulf region. Iran sees terrorism as a means of attacking its enemies that is less likely to result in direct retribution against the Islamic Republic. This view has been reinforced by the United States' decisive victory in the Persian Gulf War.[xix]

Despite the overall decline in state-sponsored terrorist attacks, Iranian-sponsored attacks have actually increased. The number of terrorist attacks and the centralization of oversight of terrorist operations has increased since the election of President Rafsanjani, despite the supposed moderation of his regime. Tehran and its surrogates carried out 35 terrorist attacks between 1989, when Rafsanjani was elected, and 1992. Twenty of these attacks were conducted in 1992 alone, and the trend for these attacks has been toward increased levels of lethality. [xx]

The Iranian government plays a significant role in international terrorism by providing money, training, weapons, intelligence, documentation, and cover for terrorist activities. Three government agencies play primary roles. The Ministry of Intelligence and Security (MOIS) is responsible for intelligence collection to support terrorist operations. The ministry is also responsible for liaison activities with supported terrorist groups and Islamic fundamentalist movements. MOIS has also conducted terrorist operations in support of Iranian objectives. Most of these activities have focused on attacks on Iranian dissidents. The Qods Force of the Iranian Revolutionary Guard Corps (IRGC) is responsible for extraterritorial operations, including terrorist operations. A primary focus for the Qods Force is training Islamic fundamentalist terrorist groups. Currently, the Qods Force conducts training activities in Iran and in Sudan. The Qods Force is also responsible for gathering information required for targeting and attack planning. The final operational element of the Iranian government's terrorist support infrastructure is the Ministry of Foreign Affairs (WA). The WA provides diplomatic cover for terrorist operations, diplomatic pouch service for importation of weapons and explosives, and a safe haven at Iranian diplomatic facilities for execution of terrorist operations.[xxi]

Iran maintains active liaison with Hizballah, HAMAS, the PU, and other terrorist groups. One of these groups - the Islamic Group, an Egyptian fundamentalist terrorist group - was involved in the bombing of the World Trade Center. Subsequent investigations revealed that members of the group who participated in the bombing received bank transfers in Germany from Iran and from Iranian organizations prior to the bombing. While this does not constitute definitive proof of Iranian involvement in the bombing, these facts suggest that the Iranian government supported the activities of the ad hoc terrorist organization that carried out the bombing.[xxii] The Iranians have also embarked on a long-term program to develop weapons of mass destruction.[xxiii]

The Intelligence Community believes that Iran is likely to continue its support for terrorist operations for the foreseeable future. Iran has never paid a significant price for any of the terrorist activities it has sponsored and has obtained tangible political benefits in the Persian Gulf region. Iran will continue to focus the majority of its attacks on Israel in hopes of derailing the Middle East peace process. The United States will also continue to be a primary target for Iranian sponsored terrorist attacks. Iran and the terrorist groups it sponsors are continuing to develop operational plans to attack the United States and its allies. Iran has an extensive intelligence collection and terrorist infrastructure throughout the world. This infrastructure is particularly well developed in the United States, Europe, and South America. Iran has also formed alliances with Islamic fundamentalists in the Philippines, Pakistan, and Afghanistan.[xxiv]

Sudan

In August 1993, the State Department added Sudan to its list of terrorist states. Authorities now consider Sudan to be second to Iran in its support of Muslim terrorist groups. The government of Sudan has links to radical Arab terrorist organizations, including HAMAS, ANO, and the PU. Sudan also provides safe haven for PLO operatives and for Egyptian fundamentalists fleeing crackdowns by the Mubarak government. The governments of Tunisia, Algeria, and Egypt have asserted that Sudan is providing weapons, funds, training, passports, and safe haven for Islamic terrorist organizations that are attempting to overthrow their governments. To date, no conclusive evidence links Sudan with any terrorist act; however, Sudanese citizens comprised five of the fifteen suspects arrested in June 1993 for plotting to bomb the United Nations Building, the Lincoln and Holland Tunnels, the New York Federal Building, and other facilities in New York City. Senior members of the National Islamic Front (NIF), which dominates the Sudanese government, have also called for attacks against the United States. The United States also suspects that Sudan provided weapons and materiel to Somali groups responsible for attacks on U.S. and U.N. forces deployed in Somalia. Iran has maintained an extremely close relationship with Sudan, and the two nations have entered into agreements for joint military and intelligence activities.[xxv]

Iraq

Since the mass expulsion of its intelligence officers and diplomats from numerous countries during the Gulf War, Iraq has not fully recovered its capability to conduct terrorist operations. Nevertheless, Iraq sponsored 39 terrorist operations in 1992 - activity which was in direct violation of its cease-fire agreement with the United Nations. One notable incident was the planned assassination of former President George Bush on his visit to Kuwait in 1993. The Iraqi government was also implicated in several dozen terrorist incidents in Northern Iraq in 1993. These attacks primarily targeted U.N. food distribution activities and humanitarian relief agency operations. Indications are that the Iraqi intelligence service has resumed terrorist targeting operations throughout the world. Iraq has a well-developed chemical weapons program and possesses biological agents. U.N. disarmament operations, however, have significantly damaged Iraq's nuclear weapons program.[xxvi]

Cuba

In the past, Cuba was a strong supporter of terrorist activities providing training, funds, weapons, and intelligence support. The Castro regime, which has become preoccupied with its own existence, is no longer able to support armed struggle actively in Latin America or other parts of the world. Currently, the regime's focus is on economic survival, and the government is attempting to upgrade diplomatic and trade relations in Latin America. However, Cuba still provides safe haven for a number of Latin American and European terrorist organizations. It still remains likely that the Castro regime would use terrorist attacks as a means to adversely affect U.S. interests and prevent the collapse of the Cuban regime; or if U.S. military action was anticipated. Cuba has a sophisticated intelligence collection capability that could be used for targeting U.S. facilities by terrorist groups. The Cuban intelligence service, the DGI, has the ability to unilaterally carry out such attacks against United States.[xxvii]

North Korea

North Korea has a worldwide capability to conduct terrorist activities against the United States or its allies. If North Korea wishes, it can mount attacks on U.S. facilities at any time. North Korea has not sponsored any terrorist activity since 1987, when it conducted a mid-flight bombing of a Korean Air Lines aircraft. The North Korean Research Department for External Intelligence (RDEI) was responsible for this attack, and an earlier attack in Rangoon, Burma that targeted an official South Korean delegation headed by South Korea's president. North Korea still provides sanctuary for terrorist groups, and military instructors at terrorist training camps in Lebanon and Sudan. The North Koreans appear to be backing away from terrorism as a means to gain economic aid and advanced technology from the United States and Japan. North Korea is believed to have chemical and biological weapons and is currently believed to be engaged in developing nuclear weapons. A significant concern has been that North Korea may be willing to sell these technologies to state supporters of terrorism or terrorist groups.[xxviii]

Islamic fundamentalist groups

A variety of Islamic fundamentalist and/or radical Arab groups have the ability to conduct attacks inside the United States. Such groups - HAMAS, Hizballah, PU, ANO, and the Islamic Group - are characterized by their increasingly strident assertions of religious justification for terrorist activities against the oppressive regimes of the developed world. In particular, groups have identified the United States as anti-Islamic. For this reason, Iran and its followers characterize the United States as the Great Satan. It is notable that from 1975 to 1987, the number of religious terrorist groups, many of which were Islamic fundamentalist, increased six-fold. In contrast, the number of Marxist-Leninist groups has remained fairly steady, while the number of ethnic terrorist groups has declined. Not only have religious terrorist groups increased in number, but they have also become increasingly more violent as a way of fulfilling their mandate from God.[xxix]

Islamic Resistance Movement (HAMAS)

Formed in 1987 as an outgrowth of the Muslim Brotherhood, HAMAS is a loosely structured organization. It is the principal political rival of Yasser Arafat's Fatah organization in the occupied territories. HAMAS has engaged in terrorist operations in the Gaza Strip and West Bank and has stridently opposed any settlement with the Israeli government. During 1994, HAMAS worked to undermine the legitimacy of the Provisional Palestinian government in the Gaza Strip and conducted several major acts of terrorism against Israel. The most prominent of these incidents was a suicide attack on an Israeli bus on the main street in Tel Aviv. This incident killed 23 people. HAMAS has links to Iran and has consistently opposed U.S. policy in the Middle East. The organization has been openly involved in propaganda and fund raising operations in the United States. [xxx]

Of all of the Islamic militant groups, HAMAS has developed the most sophisticated U.S. infrastructure, including charitable, political, social, and military activities. HAMAS has conducted training in the United States on military tactics and the building of explosive devices. Musa Abu Marzuk, the international political director of HAMAS, was recently arrested by immigration authorities in the United States, and his extradition to Israel for terrorist activities is currently pending. Marzuk was a resident alien in the United States until 1993 and is credited with creating much of the HAMAS infrastructure in the United States. HAMAS has threatened to conduct terrorist attacks in the United States if Marzuk is extradited to Israel.[xxxi]

Party of God (Hizballah)

Hizballah, a radical Shia group, was formed in Lebanon in 1982-1983 as a result of the merger of Hussein Musawi's Islamic Amal and the Lebanese branch of the Da'wa Party. Hizballah, which is closely allied with Iran, wishes to create an Islamic republic in Lebanon. It is believed that Hizballah was responsible for the bombing of the U.S. embassy in Lebanon and the Marine barracks in Beirut, and the kidnapping and murder of Western hostages in Lebanon. Hizballah has demonstrated the ability to conduct terrorist operations outside the Middle East and has claimed responsibility for the bombing of the Israeli Embassy in Buenos Aires in March 1992. Hizballah receives substantial amounts of financial, training, weapons, explosives, political, diplomatic, and organizational aid from Iran. It is believed that Hizballah has a significant support infrastructure in the United States capable of carrying out terrorist operations. However, at this time, there is no evidence that Hizballah is contemplating any type of attack against the United States.

Hizballah likely would coordinate any operation with elements of the Iranian Revolutionary Guard Corps who are believed to have entered the United States in the late 1980s on student visas.[xxxii]

Palestine Islamic Jihad (PIJ)

The PIJ originated in the Gaza Strip during the 1970s. Rather than a cohesive entity, the group appears to be a loose coalition of factions. The PIJ is dedicated to creating an Islamic state in Palestine and destroying Israel. In 1994, the PIJ carried out a number of attacks against Israel with the aim of destroying the peace accord with the Palestinians. In January 1995, the PIJ claimed responsibility for the bombing of an Israeli bus stop at which Israeli soldiers were awaiting transportation to their base. The attack killed 21 soldiers. The PIJ publicly has threatened to attack U.S. interests as well as Arab governments that the group believes have been tainted by Western secularism. Iran, Sudan, and Syria provide aid to some PIJ factions.[xxxiii] The PIJ also has a sizable presence in the United States with support activities in Tampa, FL; Chicago, IL; and Brooklyn, NY.[xxxiv]

Abu Nidal Organization (ANO)

Since 1974, the ANO has carried out over 90 terrorist attacks in 20 countries, killing or injuring more than 900 people. The ANO has an overseas support structure which includes an intelligence collection activity that is active in the United States. ANO has targeted the United States, United Kingdom, France, Israel, moderate Palestinians, the PLO, and various Arab countries. The ANO has demonstrated the capability to conduct operations worldwide. [xxxv]

Islamic Group (Al-Gama'a al-islamiyya)

The Islamic Group is an Egyptian Islamic extremist group whose spiritual leader is Sheik Omar Abdel Rahman. The group's goal is to overthrow the government of Hosni Mubarak and replace it with an Islamic state. Members of this group's predecessor were involved in the assassination of Anwar Sadat and have conducted terrorist attacks inside Egypt. Having strongly condemned the United States for its participation in Middle East politics and its support of the Mubarak government, leaders of the Islamic Group have urged their followers to punish the United States., The groups financial, logistics, and training support seems to come mainly from Iran and Sudan. Sheik Rahman and a number of his followers were tried in Federal district court in New York for conspiring to conduct a series of terrorist attacks in New York City during 1993.[xxxvi]

Terrorism Trends

As they are becoming more violent, terrorist groups also have expanded the range of targets that they consider legitimate. Brian Jenkins, formerly the director of the Rand Corporation's Program on Subnational Conflict, has postulated three reasons for this trend. First, as generational replacement has occurred in terrorist organizations, new leaders have become less concerned with ideological constraints and adverse public opinion. As a result, they are more willing to use excessively violent or shocking tactics. Second, leaders desire to maintain media attention. Limited acts of terrorism repeated over time have failed to gain desired media attention. To receive attention, terrorists have escalated the level of violence and have used bolder, more shocking tactics designed to force the media and the public to pay attention to the terrorist group and its demands. Finally, the internal dynamics of terrorist groups require that the organization move inexorably toward its goals. Increasingly violent tactics allow group members to perceive that they are increasingly powerful and are likely to achieve their objectives.[xxxvii]

Data gathered from 1968 to 1990 substantiates the trend that the number of terrorist groups is increasing and that groups are also more violent. In 1990, there were 70 active terrorist groups throughout the world, compared to 11 identifiable groups in 1968. Although the number of terrorist incidents identified in the 1980s increased by only one-third over those identified in the 1970s, the level of violence increased dramatically. In the 1980s, the number of deaths worldwide attributed to terrorism doubled. There was a 75 percent increase in the number of terrorist incidents resulting in fatalities, a 115 percent increase in incidents resulting in 5 or more deaths, and a 135 percent increase in incidents resulting in 10 or more deaths. Pinkerton Risk Assessment Services, an organization that tracks terrorist incidents, recorded an unprecedented 5,404 terrorist incidents in 1992, resulting in over 10,000 deaths. These incidents represent an 11 percent increase over 1991 figures. Part of this pattern is attributable to the growth of religious terrorism. Religious terrorists differ from traditional ideological terrorists in that the former are willing to sacrifice to obtain their objective. Consequently, religious terrorists are more likely to use indiscriminate violence. They see themselves as involved in a total war in which there are no innocent parties. In determining operational matters, religious terrorists also are largely unconcerned with public opinion.

As discussed earlier, some terrorist groups are evolving into new organizational structures that are harder to detect and infiltrate. These terrorist groups are often a collection of factions with common interests. Accordingly, the groups form, change, and regroup in response to specific agendas or planned actions. The groups tend to be religious or ethnic organizations that often have major grievances with the United States. The extremist factions of Islamic fundamentalist groups that are currently emerging fit this pattern. While many are funded by Iran or supported by Sudan, the emerging groups are not controlled or directed by either state. Instead, they tend to be autonomous in their planning and decision-making functions. According to William Webster, former Director of Central Intelligence, there may be dozens of such groups in the United States waiting for the opportunity to strike. The large number of these groups as well as their lack of central direction and changing organizational structures, make them very difficult to crack.

Finally, a trend may be developing regarding a sponsoring state's use of terrorists to conduct a proxy war against the United States. Terrorist groups offer the sponsoring state a deniable method to attack primary U.S. interests. In turn, sponsoring states would provide terrorist groups with funding, access to weapons technologies, intelligence, target planning support, logistics support, and secure communications. In times of crisis or conflict, the use of terrorists as proxies is the aspect of terrorism that appears to be the most dangerous to U.S. interests because attacks could be directed at facilities critical to force mobilization or crisis management.

Conclusion

To succeed, terrorist operations require detailed information for planning and executing an attack. Many of these organizations have access to intelligence produced by sponsor states or have the ability to produce intelligence required for an attack. OPSEC can be used to deny adversaries information on the movements of key personnel, or the identity and vulnerabilities of critical facilities. The OPSEC process can assist program managers in determining the best security program to protect against terrorist attack based upon assessed risk levels and the cost of implementing security countermeasures. OPSEC procedures can be used to deny terrorists the critical information that they require to plan an attack, and security countermeasures can be implemented that are commensurate with the assessed level of risk.

The Threat of Domestic Terrorism

by Lynn Fischer

DoD Security Institute

While the international terrorist threat to U.S. persons and property is the continuing concern of U.S. defense and law enforcement organizations, there is another dimension to contemporary terrorism that must receive at least as much attention in security awareness programs: *domestic terrorism.* This brand of programmed violence which also has the objective of influencing governmental policy or public opinion, however, is homegrown. The recent increase in domestic violence is said to be associated with the rise of antigovernment sentiment and the proliferation of self-styled militia and paramilitary groups–some of which take extremist positions on race, religion, federal authority, gun control, or taxation.

Not all bombings in this country fall under the category of domestic terrorism, but most of the violence associated with anti-governmental attacks takes this form. According to a recent Bureau of Alcohol, Tobacco and Firearms (ATF) report, bombings or attempted bombings increased from 2,098 in 1990 to 3,199 in 1994 (the latest year available), a 52% increase.[xxxviii] Property damage from bombings rose to $7.5 million, with 308 people injured and 31 killed. Not included in the report was the tragic Oklahoma City bombing in 1995.

What's going on here?

How can this be explained? Some ATF experts call attention to the ready availability of materials and easy access to instructions and explosives information on the Internet. Others point to the copy-cat effect following Oklahoma City, anger or revenge against specific persons or agencies, or more ominous cultural or sociological trends. The purpose of this article is not to explain the mindset, values, or motivations of those who would commit acts of domestic terrorism, but to document the fact that *there is a growing threat to government facilities and federal employees throughout the nation.*

What we as security educators or entrusted federal employees or service members need to be aware of is that terrorism has become not just a special concern for personnel who travel or live overseas. In very recent years it has become a subject of special interest for all of us, no matter how far from the border or remotely located we are. In fact several of the more-terrorist-related events have occurred in places where we would have least expected it. Although not proven in court to be *domestic* terrorism, the destruction of the Alfred P. Murrah Federal Building in Oklahoma, America's heartland, in April of 1995, was a terrorist act which few of us would ever have thought possible. Over 100 Federal employees and members of their families died in that tragic event.

What follows is a review of some of the lesser known events also involving federal facilities or personnel, most of which followed the Oklahoma City bombing. These successful or attempted acts of terrorism which were reported in the public media clearly have domestic (as opposed to foreign) instigators:

March 1995, Central Minnesota. Two members of an anti-tax Minnesota militia, the Patriots Council, were convicted of making an illegal batch of ricin, a toxic derivative of the castor bean, that they planned to use against law-enforcement officers who had served legal papers on members of the group. Douglas Baker and Leroy Wheeler are the first offenders to be convicted under the Biological Weapons and Anti-Terrorism Act of 1989. In August, indictments were returned against two additional alleged conspirators. According to trial testimony, members of the group planned to poison U.S. agents by placing ricin on doorknobs and to blow up a federal building.

October 11, 1995, The Arizona Desert. Unknown terrorists derail a passenger train 60 miles southwest of Phoenix. One person was killed and 80 injured when the Amtrak train jumped the track and plunged over a bridge. Saboteurs had removed a section of track and bridged the gap with wire to disable the electronic warning system. Notes found at the scene referred to the federal siege at Waco and to Ruby Ridge. At least one note was signed "Sons of Gestapo," a group unknown to terrorism experts.

November 13,1995, Muskogee, Oklahoma. A self-proclaimed "antigovernment prophet," Ray Willie Lampley and three others are charged with plotting a series of bombings against abortion clinics, homosexual gathering places, welfare offices and offices of the Anti-Defamation League and the Southern Poverty Law Center. The four members of the Oklahoma Constitutional Militia were arrested before any of their plans were carried out and charged with conspiracy to manufacture and possess bombs to blow up federal offices in several cities. Lampley and two others were found guilty of the bomb charges in April 1996.

December 18, 1995, Reno, Nevada. Two unemployed and heavily indebted construction workers, Ellis Hurt and Joseph Bailie attempted to bomb the Reno, Nevada, office of the Internal Revenue Service. The pair placed a bomb made of about 100 pounds of fertilizer and kerosene with a lit fuse in a parking lot next to the IRS building. However, the triggering mechanism failed and bomb did not ignite. Authorities on the scene believe that many deaths and injuries would have occurred had it gone off. Bailie was described by an assistant U.S. Attorney as a man obsessed with the IRS who boasted that he had not paid taxes since 1985. Hurst testified against Bailie and was sentenced to 10 years. Both were convicted of conspiracy, attempted destruction of a government building, and the use of an explosive device while committing a violent crime. Bailie received a 36-year sentence.

January 6, 1996, Espanola, New Mexico: A bomb exploded outside of a U.S. Forest Service headquarters. The blast caused $25,000 damage to the offices but no injuries as it occurred on a Saturday night. A Forest Service employee in Nevada has been targeted twice. His unoccupied office was hit by a pipe bomb in March 1995 and another blew up a van parked outside his house in August. His wife and daughter were at home, but not injured. The Forest Service has been involved in local controversies over Federal land management, grazing, and logging. To date no significant leads have been reported.

April 15,1996, Vacaville, California. The Department of Labor, Mine Safety and Health office in Vacaville received a threat from a caller who said "You guys are all dead. Timothy McVeigh lives on." Several hours later a bomb exploded in the truck of a federal employee injuring him and his wife. The employee, an inspector at the mine office, and his wife were driving home when they heard an explosion and lost control of the vehicle. They escaped the truck before it burned, but were hospitalized.

May 20, 1996, Laredo, Texas. An explosion blew out the windows of a five-story office building which was the location of an FBI field office staffed by 12 agents. There were no injuries or structural damage. It is not known whether the FBI was the intended target; the building housed a bank and several other offices. An anonymous caller claiming responsibility for the blast said he belonged to "Organization 544."

August 10, 1996, Austin, Texas. Charles Ray Polk was sentenced to more than 20 years for plotting to bomb the office of the U.S. Internal Revenue Service in Austin. Polk, a car salesman, had been convicted on six counts of explosives and firearms violations. Evidence presented at the trial showed that he had planned to plant more than a thousand pounds of explosives in the IRS service center.

October 11, 1996, Clarksburg, West Virginia. Seven men having connections with a local antigovernment paramilitary group were arrested on charges of plotting to blow up the Criminal Justice Information Services Division complex near Clarksburg. The arrests were made as members of the West Virginia Mountaineer Militia were assembling large quantities of explosives and blasting caps. Militia leader Floyd Raymond Looker is alleged to have obtained blueprints of the FBI facility from a Clarksburg firefighter. Plastic explosives were confiscated by law enforcement officials at five locations in West Virginia, Pennsylvania, and Ohio.

As in the Clarksburg case, effective preventative law enforcement action surely saved many lives. In several instances, domestic terrorists were apprehended before they could implement their deadly plans. And the above examples are not the complete story. Reports of other arrests related to terrorist conspiracies or to the illegal possession of explosives are appearing frequently in the press and news wires. Here is a sample of news items over the same time frame:

In Las Vegas, New Mexico, a district attorney's office is hit with molotov cocktails. A Romanian immigrant is stopped as he attempts to board a flight at Tampa and is arrested for carrying five hand-made explosive devices, weapons, and 180 rounds of ammunition. A man identified as a member of an antigovernment Freeman group is apprehended in Topeka, Kansas, after authorities find a bomb-triggering device in his car. In April of this year, two members of the Georgia Republic Militia are arrested after plotting to make dozens of pipe bombs. The accused claim they were arming themselves for war against the United Nations and the New World Order.

In June, 12 members of the so-called Viper Militia in Phoenix are arrested for a conspiracy to make bombs and other weapons. On November 17, three of the members are convicted for conspiring to use deadly weapons. In July 1996, the FBI arrests eight people including four members of an antigovernment militia in Bellingham, Washington, for possession of guns and explosives . The eight are accused of arming themselves for a clash with the government. In the same month, four members of the Washington State Militia and four members of a Seattle-based Freeman group are arrested on Federal conspiracy charges. The eight are accused of arming themselves for war against the U.S. Government or the United Nations. In September, a Staten Island, New York, man who was stockpiling weapons for "an up-coming battle with a secret organization" is arrested by ATF agents.

The bottom line for federal personnel

What does all of this mean in terms of effective action on our part to counter the threat of domestic or even foreign-sponsored terrorism? For the security educator, as always, after having established the credibility of the threat, the next step is to tell us what to do about it. Part of the answer is found in remarks of Senator Mike DeWine quoted in the *Cleveland Plain Dealer* following the Oklahoma City bombing.

Commenting on recent acts of domestic terrorism, Senator DeWine stated that strong undercover work has no substitute and that these events reinforce the need for human intelligence penetration into these terrorist groups. He went on to say, "Human intelligence is the only way you find information that will prevent actions such as this." The corollary to this is that good human intelligence depends on the free flow of relevant and timely communications to law enforcement officials who then can take action. The best source of this information is an alert, aware, and committed workforce who are in a position to see things and hear things which might signal a life-threatening situation or conspiracy to destroy U.S. government facilities.

Preventative action

A related article in this issue of the *Bulletin*, focuses on the issue of employee involvement in the process of counterintelligence investigations. In "Looking for the Unexpected" we discuss the recent White House security guidance on anomalies-the recognition and reporting of unexpected behavior, patterns, or events which are clues that an adversarial interest has penetrated our security.

The reporting of anomalies to stop espionage is essentially the same idea as keeping law enforcement and security authorities informed about indicators that might signal an intensified or immediate terrorist threat. In both situations U.S. government assets and even lives are at risk, and aware and motivated employees and service members have an important role to play.

This raises the question: What should be recognized as important, reportable indicators and events that security and law-enforcement professionals need to know about? The following list has been compiled from suggestions made by counterterrorism experts for use in security education to combat domestic terrorism. (For personal protection measures please consult anti-terrorism publications listed in this issue as available through the Office of the Joint Chiefs of Staff.)

Any of the following events might mean danger and should be a reason for an immediate report or for seeking advice from security or law enforcement officials:

- Anonymous tips, phone calls, or notes of a threatening nature which may identify groups or carry extremist messages.

- Surveillance by suspicious persons of federal offices or federal employees performing official duties.

- Unidentified or unattended packages, cans, or other containers left in or near government offices.

- Unattended and unoccupied vehicles parked in unauthorized or inappropriate locations, particularly those in close proximity to buildings or other structures.

- Requests for plans, blueprints, or engineering specification for federal buildings or commercially-owned buildings that house government offices, by those who have no official reason to have them.

- Unauthorized access even to unsecured areas by unknown or unidentified persons who have no apparent reason for being there.

- Packages or heavy envelopes which arrive in the mail from unknown senders or which have a peculiar odor or appearance -- often without a clear return address.

- Confrontation with angry, aggressively belligerent, or threatening persons by federal officials in the performance of their official duties.

- Extremely threatening or violent behavior by co-workers who indicate that they may resort to revenge against a group, company, or government agency.

Living with the Threat

We live with many dangers in our lives, ranging from everyday household accidents to natural disasters. We do so without relentless fear. Just as we face the possibility of having our home burglarized or vandalized, we might also face similar crimes at our place of work. Terrorism is a fact of contemporary life. It is important to be aware of the threat of violence and to take intelligent and reasonable steps to protect ourselves and government facilities. But it is also important to know that we can do something to prevent it. Recent events have demonstrated that those who would use violent acts to achieve political objectives can be stopped in their tracks, before they kill or destroy, by vigilance and timely communications to those entrusted with the job of counterterrorism.

Endnotes

[i] From Defense Secretary Perry's endorsement to the Downing Report as submitted to the President, 15 September 1996.
DoD O-2000-12-H was issued February, 1993 by the Assistant Secretary of Defense for Special Operations and Low-Intensity Conflict and is available through normal publication channels. The Handbook is currently in revision to further delineate the standards and guidance provided. The updated Handbook should be ready for distribution in February 1997. The point of contact for this revision is Lt. Col. Leptrone on the Joint Staff, J-34, Combating Terrorism; (703) 693-8182.
[ii] *The Final Report – Antiterrorism Task Force* is dated 6 May 1996 and was signed by the Chairman of the Joint Chiefs of Staff, John M. Shalikashvili. After the Khobar Towers bombing near Dhahran, Secretary of Defense Perry asked General Wayne A. Downing, United States Army (Retired), to assess the facts and circumstances surrounding the tragedy. *The Report of the Downing Assessment Task Force* is dated 30 August 1996.
[iii] The Center for Security Awareness Information (CSAI) will soon announce a method for the distribution of these products to Defense agencies and to the contractor community.
[iv] U.S. House of Representatives, *Testimony of the Acting Director of Central Intelligence on the Omnibus Counterterrorism Act of 1995*, Hearings before the Committee on the Judiciary, April 6, 1996, 10.
[v] Terrorist Research and Analysis Center, *Terrorism in the United States 1982-1992*, Washington, DC: Federal Bureau of Investigation, July 1993; and Terrorist Research and Analysis Center, *Terrorism in the United States 1993*, Washington, DC: Federal Bureau of Investigation, July 1994.
[vi] Stephen T. Hosmer and George K. Tanharn, *Countering Covert Aggression*, Rand Note 2412-USDP, Santa Monica, CA; Rand Corporation, January 1986, pp. 3-4.
[vii] U.S. House of Representatives, *Testimony of Acting Director of Central Intelligence on the Omnibus Counterterrorism Act of 1995*, Hearings before the Committee on the Judiciary, April 6, 1995, pp. 6-7.
[viii] Ibid., p. 6.
[ix] Steven Emerson, "The Other Fundamentalists: A Report on the Islamic Extremist Network in the United States," *The New Republic*, June 12, 1995, pp. 21-30.
[x] Jeffrey D. Simon, *The Terrorist Trap: America's Experience with Terrorism*, Bloomington, IN: Indiana University Press, 1994.
[xi] *Military Operations in Low Intensity Conflict*, Headquarters, Departments of the Army and the Air Force, December 1990.
[xii] Terrorist Research and Analysis Center, *Terrorism in the United States 1993*, Washington, DC: Federal Bureau of Investigation, July 1994; and United States Senate, *High Tech Terrorism*, Hearings before the Subcommittee on Technology and Law, Committee on the Judiciary, Stat Hearing 100-1078, Washington, DC: USGPO, 1989.
[xiii] Interview, Combating Terrorism Directorate, Office of the Assistant Secretary of Defense for Special Operations and Low Intensity Conflict, September 26, 1994.
[xiv] This article discusses the participation of these nations in terrorist activities.
[xv] Foreign Affairs and National Defense Division, *Terrorism: U.S. Policy Options*, Washington, DC: Congressional Research Service, Library of Congress, July 22, 1993.
[xvi] Diarmuid Jeffreys, *The Bureau: Inside the Modern FBI*, Boston: Houghton Mifflin Company, 1995, pp. 282-283.
[xvii] Office of the Coordinator for Counterterrorism, "Appendix C: Libya's Continuing Responsibility for Terrorism," in *Patterns of Global Terrorism – 1991*, Washington, DC: Department of State, April 1992, pp. 69-74.
[xviii] Office of the Coordinator for Counterterrorism, *Patterns of Global Terrorism – 1994*, Washington, DC: Department of State, April 1995, pp. 23-24.
[xix] Sean K. Anderson, "Iranian State-Sponsored Terrorism," Conflict Quarterly, Fall 1991 (11:4), pp. 19-31.

[xx] United States Senate, Statement of R. James Woolsey, Director of Central Intelligence, in *Terrorism and America: A Comprehensive Review of the Threat, Policy, and Law*, Hearings before the Committee on the Judiciary, April 21 and 22, 1993, Washington, DC: USGPO, 1994, pp. 11-12.
[xxi] Worldwide Terrorist Threat Briefing by Gregg F. Prewitt, Chief, Terrorism Threat Warning Branch, Defense Intelligence Agency, at the DoD Worldwide Antiterrorism Conference, Newport, RI, August 29, 1995; and John Hughes, "Behind Concerns of Iran-Sudan Ties," *The Christian Science Monitor*, September 2, 1993, p. 19.
[xxii] Bruce Hoffman, *Responding to Terrorism Across the Technological Spectrum*, Carlisle, PA: Strategic Studies Institute, U.S. Army War College, July 15, 1994.
[xxiii] Office of the Coordinator for Counterterrorism, *Patterns of Global Terrorism 1993*, Washington, DC: Department of State, April 1994.
[xxiv] Worldwide Terrorist Threat Briefing by Gregg F. Prewitt, Chief, Terrorism Threat Warning Branch, Defense Intelligence Agency, at the DoD Worldwide Antiterrorism Conference, Newport, RI, August 29, 1995.
[xxv] Office of the Coordinator for Counterterrorism, *Patterns of Global Terrorism 1993*, Washington, DC: Department of State, April 1995, p. 23.
[xxvi] Ibid., p. 21.
[xxvii] Ibid., p. 20.
[xxviii] PACOM Terrorist Threat Briefing, COL C.K. Akana, Director of Security Police, Fifth Air Force, at the DoD Worldwide Antiterrorism Conference, Newport, RI, August 29, 1995.
[xxix] Bruce Hoffman, *Terrorist Targeting: Tactics Trends, and Potentialities*, Santa Monica, CA:: RAND, 1992.
[xxx] Foreign Affairs and National Defense Division, *HAMAS. The Organization, Goals, and Tactics of a Militant Islamic Organization*, Washington, DC: Congressional Research Service, Library of Congress, August 19, 1993.
[xxxi] Steven Emerson, "The Other Fundamentalists: A Report on the Islamic Extremist Network in the United States," The New Republic, June 12, 1995, pp. 21-30; and James Brooke and Elaine Sciolino, "U.S. Muslims Say Their Aid Pays for Charity, Not Terror: Bread or Bullets, Money for HAMAS," *The New York Times*, August 16, 1995, p. A1.
[xxxii] Office of the Coordinator for Counterterrorism, Patterns of Global Terrorism 1993, Washington, DC: Department of State, April 1995, pp. 18 and 42; and Robert Kupperman and Jeff Kamen, *Final Warning: Averting Disaster in the New Age of Terrorism*, New York: Doubleday, 1989.
[xxxiii] Office of the Coordinator for Counterterrorism, *Patterns of Global Terrorism 1993*, Washington, DC: Department of State, April 1995, pp. 17 and 53.
[xxxiv] Steven Emerson, "The Other Fundamentalists: A Report on the Islamic Extremist Network in the United States," *The New Republic*, June 12, 1995, pp. 21-30.
[xxxv] Office of the Coordinator for Counterterrorism, *Patterns of Global Terrorism 1993*, Washington, DC: Department of State, April 1995, p. 33.
[xxxvi] Office of the Coordinator for Counterterrorism, *Patterns of Global Terrorism 1993*, Washington, DC: Department of State, April 1994.
[xxxvii] Brian M. Jenkins, ed., *Terrorism and Beyond: Conference on Terrorism and Low-Level Conflict*, Santa Monica, CA: RAND, 1982.
[xxxviii] Based on the ATF 1994 Arson and Explosive Incident Report as described in several news media reports.

APPENDIX B

PRESIDENTIAL DECISION DIRECTIVE 39 (UNCLASSIFIED)

The following is a copy of an unclassified* abstract derived from Presidential Decision Directive (PDD-39)/U.S. Policy on Counterterrorism, dated June 21, 1995. This abstract has been reviewed and approved by the National Security Council (NSC) for distribution to Federal, State, and local emergency response and consequence management personnel to assist them in responding to terrorist emergencies.

* The full text of PDD-39 is a CLASSIFIED document. State and local officials, however, should understand that PDD-39 essentially gives the responsibility of response to terrorist attacks to the FBI for "crisis management" and FEMA for "consequence management." State and local agencies and assets will be expected to support the Federal efforts.

U.S. POLICY ON COUNTERTERRORISM
Presidential Decision Directive (PDD-39)

1. General. Terrorism is both a threat to our national security as well as a criminal act. The Administration has stated that it is the policy of the United States to use all appropriate means to deter, defeat, and respond to all terrorist attacks on our territory and resources, both people and facilities, wherever they occur. In support of these efforts, the United States will:

Employ efforts to deter, preempt, apprehend, and prosecute terrorists.

Work closely with other governments to carry out our counterterrorism policy and combat terrorist threats against them.

Identify sponsors of terrorists, isolate them, and ensure they pay for their actions.

Make no concessions to terrorists.

2. Measures to Combat Terrorism. To ensure that the United States is prepared to combat terrorism in all its forms, a number of measures have been directed. These include reducing vulnerabilities to terrorism, deterring and responding to terrorist acts, and having capabilities to prevent and manage the consequences of terrorist use of nuclear, biological, and chemical (NBC) weapons, including those of mass destruction.

a. Reducing Vulnerabilities. In order to reduce our vulnerabilities to terrorism, both at home and abroad, all department/agency heads have been directed to ensure that their personnel and facilities are fully protected against terrorism. Specific efforts that will be conducted to ensure our security against terrorist acts include the following:

Review the vulnerability of government facilities and critical national infrastructure.

Expand the program of counterterrorism.

Reduce the vulnerabilities affecting civilian personnel/facilities abroad and military personnel facilities.

Exclude/deport persons who pose a terrorist threat.

Prevent unlawful traffic in firearms and explosives, and protect the President and other officials against terrorist attack.

Reduce U.S. vulnerabilities to international terrorism through intelligence collection/analysis, counterintelligence, and covert action.

b. Deter. To deter terrorism, it is necessary to provide a clear public position that our policies will not be affected by terrorist acts and we will vigorously deal with terrorist sponsors to reduce terrorist capabilities and support. In this regard, we must make it clear that we will not allow terrorism to succeed and that the pursuit, arrest, and prosecution of terrorists is of the highest priority. Our goals include the disruption of terrorist-sponsored activity including termination of financial support, arrest and punishment of terrorists as criminals, application of U.S. laws and new legislation to prevent terrorist groups from operating in the United States, and application of extraterritorial statutes to counter acts of terrorism and apprehend terrorists outside of the United States. Return of terrorists overseas, who are wanted for violation of U.S. law, is of the highest priority and a central issue in bilateral relations with any state that harbors or assists them.

c. Respond. To respond to terrorism, we must have a rapid and decisive capability to protect Americans, defeat or arrest terrorists, respond against terrorist sponsors, and provide relief to the victims of terrorists. The goal during the immediate response phase of an incident is to terminate terrorist attacks so that the terrorists do not accomplish their objectives or maintain their freedom, while seeking to minimize damage and loss of life and provide emergency assistance. After an incident has occurred, a rapidly deployable interagency Emergency Support Team (EST) will provide required capabilities on scene: a Foreign Emergency Support Team (FEST) for foreign incidents and a Domestic Emergency Support Team (DEST) for domestic incidents. DEST membership will be limited to those agencies required to respond to the specific incident. Both teams will include elements for specific types of incidents such as nuclear, biological, or chemical threats.

The Director, FEMA, will ensure that the Federal Response Plan is adequate for consequence management activities in response to terrorist attacks against large U.S. populations, including those where weapons of mass destruction are involved. FEMA will also ensure that State response plans and capabilities are adequate and tested. FEMA, supported by all Federal Response Plan signatories, will assume Lead Agency role for consequence management in Washington, DC and on scene. If large scale casualties and infrastructure damage occur, the President may appoint a Personal Representative for consequence management as the on scene Federal authority during recovery. A roster of senior and former government officials willing to perform these functions will be created and the rostered individuals will be provided training and information necessary to allow them to be called on short notice.

Agencies will bear the costs of their participation in terrorist incidents and counterterrorist operations, unless otherwise directed.

d. NBC Consequence Management. The development of effective capabilities for preventing and managing the consequences of terrorist use of nuclear, biological, or chemical (NBC) materials or weapons is of the highest priority. Terrorist acquisition of weapons of mass destruction is not acceptable and there is no higher priority than preventing the acquisition of such materials/weapons or removing this capability from terrorist groups. FEMA will review the Federal Response Plan on an urgent basis, in conjunction with supporting agencies, to determine its adequacy in responding to an NBC-related terrorist incident; identify and remedy and shortfalls in stockpiles, capabilities, or training; and report on the status of these efforts in 180 days.

APPENDIX C

THE FEDERAL RESPONSE PLAN
TEXT OF SECTIONS I - VI

Federal Response Plan
Text only, Sections I - VI
(For Public Law 93-288, As Amended)

BASIC PLAN

I. INTRODUCTION

In 1988, Public Law 93-288 was amended by Public Law 100-707 and retitled as the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288, as amended). The Stafford Act provides the authority for the Federal Government to respond to disasters and emergencies in order to provide assistance to save lives and protect public health, safety, and property.

The Federal Response Plan (for Public Law 93-288, as amended), hereafter referred to as the Plan, is designed to address the consequences of any disaster of emergency situation in which there is a need for Federal response assistance under the authorities of the Stafford Act. It is applicable to natural disasters such as earth quakes, hurricanes, typhoons, tornadoes, and volcanic eruptions; technological emergencies involving radiological or hazardous material releases; and other incidents requiring Federal assistance under the Act.

The Plan describes the basic mechanisms and structures by which the Federal government will mobilize resources and conduct activities to augment State and local response efforts. To facilitate the provision of Federal assistance which a State is most likely to need under twelve Emergency Support Functions (ESFs). Each ESF is headed by a primary agency, which has been selected based on its authorities, resources and capabilities in the particular functional area. Other agencies have been designated as support agencies for one or more ESF based on their resources and capabilities to support the functional area. The twelve ESFs serve as the primary mechanism through which Federal response assistance will be provided to the affected State under the overall coordination of the Federal Coordinating Officer (FCO) appointed by the Director of the Federal Emergency Management Agency (FEMA) on behalf of the President.

The Plan serves as the foundation for the further development of detailed headquarters and regional plans and procedures to implement Federal response activities in a timely and efficient manner to support State response activities.

A. Purpose

The Plan establishes an architecture for a systematic, coordinated, and effective Federal response. The purpose of the Plan is to:

- Establish fundamental assumptions and policies;
- Establish a concept of operations that provides an interagency coordination mechanism to facilitate the immediate delivery of the Federal response assistance;
- Incorporate the coordination mechanisms and structures of other appropriate Federal plans and responsibilities into the overall response
- Assign specific functional responsibilities to appropriate Federal departments and agencies
- Identify actions that participating Federal departments and agencies will take in the overall Federal response, in coordination with the affected State.

B. Scope

The Plan applies to all Federal government departments and agencies which are tasked to provide response assistance in a disaster or emergency situation. It describes Federal actions to be taken in providing immediate response assistance to one or more affected States.

Under the Plan, a State means any State of the United States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa, the Trust Territory of the Pacific Islands, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, or the Republic of the Marshall Islands.

Response assistance includes those actions and activities which support State and local government efforts to save lives, protect public health and safety, and protect property. The identified actions and activities in the Plan, carried out under the ESFs, are based on the existing Federal agency statutory authorities or on specific functional mission assignments made under the provisions of P.L.93-288, as amended, and identified in the ESF Annexes to the Plan.

The Plan does not specifically address recovery assistance, including the provision of temporary housing, loans, and grants to individuals; business loans; and grants to local and State government entities provided under the disaster assistance programs of FEMA and other agencies. However, in most instances, recovery activities will be conducted concurrently with response activities.

In some instances, a disaster or emergency may result in a situation which affects the national security of the United States. For those instances, appropriate national security authorities and procedures will be utilized to address the national security requirements of the situation.

C. Organization

As shown in figure 1, the plan consists of the following:

- The Basic Plan, describing the purpose, scope, situation, policies and concept of operations of Federal response activity in a disaster.
- Appendices to the Basic Plan, including a list of acronyms/abbreviations, terms and definitions, and authorities and directives.
- Functional Annexes to the Basic Plan describing the policies, situation, planning, assumptions, concept of operations and responsibilities for each ESF.
- Support Annexes to the Basic Plan describing the areas of Financial Management, Public Information, and Congressional Relations.

II Policies

A. Authorities

1. In providing response assistance under the Plan, Federal departments and agencies are covered under the authorities of P.L. 93-288, the President may direct any Federal agency to utilize its authorities and resources in support of State and local assistance efforts. This authority has been further delegated to the Director, FEMA, the Associate Director, State and Local Programs and Support (SLPS), and to the FEMA Regional Directors in carrying out the provisions of the Stafford Act.

2 Response by departments and agencies to lifesaving and life protecting requirements under the Plan has precedence over other Federal response activities, except where national security implications are determined to be of a higher priority. Support from departments and agencies will be provided to the extent that it does not conflict with other emergency missions which a department or agency is required to carry out.

3 The Plan does not supplant existing plans or authorities, such as the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) or the Federal Radiological Emergency Response Plan (FRERP), which have been developed for response to incidents under department and agency statutory authorities other than the Stafford Act. However, the Plan may be used to supplement these plans and authorities, as required, to provide and effective response.

B. Assignment of Responsibilities

The Plan provides standing mission assignments to the designated departments and agencies with primary and support responsibilities to carry out ESF activities. Federal departments and agencies designated as primary agencies serve as Federal executive agents under the FCO in accomplishing the ESF response missions. Upon activation of an ESF, a primary agency is authorized, in coordination with the FCO and the State, to initiate and continue the actions to carry out the ESF missions described in the ESF Annexes to the Plan, including tasking of designated support agencies to carry out assigned ESF missions.

C. Response Requirements

Federal assistance provided under P.L.93-288, as amended, to supplement State and local government response efforts. ESFs will coordinate with the FCO and the affected State to identify specific response requirements and will provide Federal response assistance based on State-identified priorities.

D. Response Coordination

1. Each ESF will provide resources using its primary and support authorities and capabilities, in coordination with other ESFs, to support its missions. ESFs will allocate available resources to each declared State based on priorities identified in conjunction with the State and in coordination with the FCO. If resources are not available within the declared State, the ESF will seek to provide them from a primary or support agency area or region. If the resource is unavailable from an area or region, the requirement will be forwarded to the appropriate ESF headquarters office for further action.

2. In the case where a conflict of priorities develops as a result of more than one ESF needing the same resource, the affected ESFs will work directly with the FCO to resolve the situation. If the FCO cannot resolve the conflict, the matter will be referred to the national Emergency Support Team (EST), and then to the Catastrophic Disaster Response Group (CDRG), if necessary, for final resolution. The national EST also serves as a central source for information on the availability of resources nationally for use in response operations.

E. Recovery Operations

Although this Plan addresses response activities of departments and agencies, under P.L.93-288, the FCO is also responsible for coordinating recovery activities to provide assistance to the affected State, as required. Recovery operations will be initiated commensurate with State priorities and based on the availability of resources which do not conflict with response operations.

F. Operating Facilities

In support of response activities under the Plan, several kinds of operating facilities have been identified to facilitate the movement and utilization of personnel and resources in the affected area. Operating facilities are grouped under two categories :

1. Single support facilities, such as a casualty collection point, used primarily to support the operations of a single ESF; and

2. Multiple support facilities used to support the operations of several ESFs. Multiple support facilities, along with their letter designations, include the following:

   Regional Operations Center - A Regional Operations Center (ROC) is the facility established at the FEMA Regional Office (or a Federal Regional Center) in response to (or in anticipation of) an event that may require Federal assistance under the Plan. The ROC is staffed by FEMA regional personnel and representatives from the ESF primary agencies as required. It serves as an initial point-of-contact in the region for the affected State(s), the national EST and Federal agencies.

   Point of Departure - A Point of Departure (POD) is the designated location (typically an airport) outside of the disaster-affected area from which response personnel and resources will deploy to the disaster area.

   Point of Arrival - A Point of Arrival (POA) is the designated location (typically an airport) within or near the disaster-affected area where newly-arriving staff, supplies and equipment are initially directed. Upon arrival, personnel and other resources are dispatched to either the Disaster Field Office (DFO), a Mobilization Center, Staging Area or directly to a disaster site.

   Assembly Point - An Assembly Point (AP) is the designated location near the disaster-affected area where newly-arriving personnel register, receive an orientation regarding the disaster situation and are assigned to a specific duty station. The AP could be located at the POA or at the DFO, once they are established.

Marshaling Area - A marshaling area (M) is an area used for the complete mobilization and assemblage of personnel and resources prior to their being sent to the disaster-affected area. Marshaling Areas are utilized particularly for disasters outside of the continental United States.

Mobilization Center - A Mobilization Center (MC) is the designated location at which response personnel and resources are received from the POA and pre-positioned for deployment to a local Staging Area or directly to an incident site, as required. An MC also provides temporary support services, such as food and billeting, for response personnel prior to their deployment.

Staging Area - A staging Area (S) is the facility at the local jurisdictional level near the disaster site where personnel and equipment are assembled for the immediate deployment to an operational site within the disaster area

Base Camp - A Base Camp (C) is the designated location under local or State control within the disaster area which is equipped and staffed to provide sleeping facilities, food, water, and sanitary services to response personnel.

Disaster Field Office - A Disaster Field Office (DFO) is the primary field location in each affected State for the coordination of response and recovery operations. It houses the FCO and staff comprising the Emergency Response Team (ERT). It will operate 24-hours a day, as needed, or with a schedule sufficient to sustain the Federal response operations. Except where facilities do not permit, the FCO will be co-located with the State Coordinating Officer (SCO) at the DFO.

G. Multi-State Response

One or more disasters may affect a number of States and regions concurrently. In those instances, the Federal government will conduct multi-State response operations; for each declared State, an FCO will be appointed to coordinate the specific requirements for Federal response and recovery within the State. Under multiple State declarations, ESF departments and agencies will be required to coordinate the provision of resources to support the operations of all of the declared States.

H. Donations

1. The Federal government encourages the giving of cash to private non-profit voluntary organizations involved in disaster relief, rather than

specific donation of clothing, food, and other goods. Should goods or services be offered, the Federal government will coordinate the transportation and distribution of only those donations it accepts for use. To facilitate this policy, the Federal government will issue appropriate press releases in conjunction with States and voluntary organizations, establish a central phone number for handling donations inquiries and set up a database for recording offers of goods and volunteer services.

2. Donations coordinators will be designated at FEMA Headquarters, at each DFO and at State locations, as needed, to work with the ESFs in managing donations. FEMA will ensure that a database is made available to the ESFs to identify needed goods and services or to respond to offers of goods and services. Should an ESF wish to take advantage of the offer of a donated good or service, that ESF is responsible for contacting the potential donor and arranging for the receipt, transport and distribution, or acquisition of the donated good or service.

I. Law Enforcement

1. Each State has the general responsibility for law enforcement, utilizing local resources, and State resources, including the National Guard (to the extent that the National Guard remains State authority and has not been called into Federal service or ordered into active duty). In some cases, a State government may experience a law enforcement emergency (including one in connection with a disaster or emergency) in which it is unable to provide an adequate response to an uncommon situation which requires law enforcement assistance, which is or threatens to become of serious or epidemic (large-scale) proportions, and with respect to which State and local resources are inadequate to protect lives and property of citizens, or to enforce the criminal.

2. In the event that such a law enforcement emergency exists throughout a State or part of a State (on behalf of itself or a local unit of government) may submit an application in writing from the Chief Executive Officer of the State to the Attorney General of the United States to request emergency Federal law enforcement assistance under the Justice Assistance Act of 1984, (42 U.S.C., Section 10501-10513) as prescribed in 28 C.F.R., Part 65. The Attorney General will approve or disapprove the application no later than 10 days after receipt. If the application is approved, Federal law enforcement assistance may be provided to include equipment, training, intelligence or personnel.

3. In the event that a serious law enforcement emergency or civil disturbance constitutes an insurrection against a State government under

10 U.S.C. 331, the State legislature or the Governor (if the legislature cannot be convened) may request, through the Attorney General, that the President call into Federal Service the militia (National Guard) of any State, and use the Armed Forces, to end the emergency or suppress the disturbance.

4. In the event that a serious law enforcement emergency or civil disturbance makes impractical or otherwise hinders the enforcement of the laws of the United States and/or deprives any part of a State's population of Constitutional rights and privilege s under 10 U.S.C. 332-333, the President may call into Federal service the militia (National Guard) of any State, and use the Armed Forces, to end the emergency or suppress the disturbance.

5. Procedures for coordinating Department of Defense (DOD) and Department of Justice (DOJ) responses to law enforcement emergencies arising under 10 U.S.C. 331-333 are set forth in the Interdepartmental Action Plan for Civil Disturbances, dated April 1, 1969.

J. Nonliability

Under Section 305 of the Stafford Act, a Federal agency or designated employee of a Federal agency, including the American Red Cross (ARC) and its employees and volunteers, performing a function under the authority of P.L.93-288, as amended, are not liable for any claim based upon the exercise or performance of or the failure the exercise or performance of that function.

K. Financial Management

FEMA funding for response activities will be made available to participating agencies performing tasks under the Plan in a manner consistent with provisions of the Stafford Act, 42 U.S.C.5121 et seq., and applicable regulations. Reimbursement will be provided in accordance with policies and procedures outlined in the Financial Management Annex and in regulations contained in 44 CFR Part 206.

L. Public Information

1. Public information activities will be undertaken to ensure the coordinated, timely, and accurate release of a wide range of information to the news media and to the public about disaster-related activities. These activities will be carried out in a Joint Information Center (JIC) established in the disaster area and staffed with Federal, State, and local public affairs representatives. Information intended for the news media

and the public will be coordinated prior to release with the FCO, other Federal departments and agencies, and with State and local officials.

2. A JIC also will be set up at FEMA Headquarters in Washington, D.C., based upon the need to provide support to the field activities for either a single-State disaster or multi-State disasters.

3. Procedures regarding public information are described in the Public Information Annex to the Plan.

M. Congressional Relations

1. Congressional liaison will be established to provide information to the Washington, D.C., and district offices of Members of Congress and to respond to questions, concerns, and problems raised by their constituents. The activities will be managed by the Congressional Liaison Officer (CLO), who will be managed by the Congressional liaison personnel from all Federal departments and agencies involved in the response, and by a congressional liaison element at FEMA Headquarters on Washington.

2. On-scene congressional relations staff will be located at the JIC established in the disaster area. At this JIC, a deputy CLO will maintain continuing liaison with the public affairs personnel at the headquarters JIC and with the congressional liaison element at FEMA Headquarters. The on-scene congressional relations staff also will provide information pertaining to requests for hearings and special legislation to the headquarters congressional liaison element.

3. Information to be released to congressional offices and constituents will be coordinated among participating Federal departments and agencies and with State and local officials, as appropriate, prior to release.

4. Both the congressional relations staff on-scene and at the national level will conduct briefings for Members of Congress and their staffs. Timing, format, and content of these briefing will be determined by the CLO in coordination with the FCO and the SCO, as appropriate.

5. Procedures regarding congressional relations and liaison are described in the Congressional Relations Annex to the Plan

N. After-Action Reports

Following Federal response to a disaster under the Plan, FEMA will coordinate the preparation of an after-action report documenting the Federal response effort. Each Federal department and agency involved in the response effort will keep records of its activity to assist in preparing the after-action report.

III. Situation

A. Disaster Condition

1. A disaster or emergency may overwhelm the capabilities of a State and its local governments in providing a timely and effective response to meet the needs of the situation. For example, the occurrence of a large or catastrophic earthquake in a high- risk, high-population area will cause casualties, property loss, disruption of normal life support systems, and will impact the regional economic, physical, and social infrastructures.

2. A disaster or emergency has the potential to cause substantial health and medical problems, with hundreds or thousands of deaths and injuries, depending on factors such as times of occurrence, severity of impact, existing weather conditions, area demographics, and the nature of building construction. Deaths and injuries will occur principally from the collapse of manmade structures and collateral events, such as fires and mudslides.

3. A disaster or emergency may cause significant damage particularly to the economic and physical infrastructure. An earthquake may trigger fires, floods, or other events that will multiply property losses and hinder the immediate emergency response effort. An earthquake or hurricane may significantly damage or destroy highway, airport, railway, marine, communications, water, waste disposal, electrical power, natural gas and petroleum transmission systems.

B. Planning Assumptions

1. The Plan assumes that a disaster or emergency, such as an earthquake, may occur with little or no warning at a time of day that produces maximum casualties. The Plan also deals with other types of disasters, such as a hurricane, which could result in a large number of casualties and cause widespread damage, or with the consequences of any event in which Federal response assistance under the authorities of the Stafford

act is required. In all cases, the Plan assumes that the response capability of an affected State will be quickly overwhelmed.

2. The large number of casualties and/or the heavy damage to buildings, structures and the basic infrastructure will necessitate direct Federal government assistance to support State and local authorities in conducting lifesaving and life-supporting efforts.

3. As a result of persons being injured and others being trapped in damaged or destroyed structures, the likelihood of a significant number of deaths within 72 hours will require the immediate response of Federal search and rescue personnel, and medical personnel, supplies and equipment to minimize preventable deaths and disabilities.

4. Federal departments and agencies may need to respond on short notice to provide effective and timely assistance to the State. Therefore, the Plan provides pre-assigned missions for Federal agencies to expedite the provision of response assistance to support State and local efforts to save lives, alleviate suffering and protect property.

5. The declaration process under the Plan will be carried out under P.L. 93-288, as amended. Under Title V, and as prescribed in 44 C.F.R., Part 205. Based on the severity and magnitude of the situation, the Governor will request the President to declare a major disaster or an emergency for the State, and the President will issue a declaration, as warranted. The President will also appoint an FCO to coordinate the overall activities under the declaration.

6. For certain situations, the President may declare an emergency with or without a Governor's request, as specified in Title V of P.L. 93-288, as amended. Under Title V, the President may direct the provision of emergency assistance either at the request of a Governor (Section 501.(a)), or upon determination by the President that an "emergency exists for which the primary responsibility rests with the United States..." (Section501.(b)).

7. The ARC is deemed to be a Federal agency for the purpose of the Plan. Though created by the United States Congress in 1905, the ARC is a private, charitable corporation whose primary functions include the alleviation of human suffering caused by disaster or other natural catastrophe.

IV. CONCEPT OF OPERATIONS

A. General

1. During the period immediately following a major disaster or emergency requiring Federal Response, primary agencies, when directed by FEMA, will take actions to identify requirements, and mobilize and deploy resources to the affected area to assist the State in lifesaving and life-protecting response efforts.

2. Agencies have been grouped together under the functional ESFs to facilitate the provision of response assistance to the State. These functions are transportation, communications, public works and engineering, firefighting, information and planning, mass care, resource support, health and medical services, urban search and rescue, hazardous materials, food and energy. If Federal response assistance is required under the Plan, it will be provided using some or all of the ESFs, as necessary.

3. Each ESF has been assigned a number of missions to provide response assistance to the State, the designated primary agency, acting as the Federal Executive Agent, and with the assistance of one or more support agencies, is responsible for managing the activities of the ESF and ensuring that the missions are accomplished. ESFs have the authority to execute response operations to directly support state needs. The primary and support agency assignments by each ESF are shown in Figure 2.

4. Specific ESF functional missions, organizational structures, response actions and primary and support agency responsibilities are described in the Functional Annexes to the Plan.

5. ESFs will coordinate directly with their functional counterpart State agencies to provide the assistance required by the State. Requests for assistance will be channeled from local jurisdictions through the designated State agencies for action. Based on State-identified response requirements, appropriate Federal response assistance will be provided by an ESF to the State, or at the State's request, directly to an affected local jurisdiction.

6. An FCO will be appointed by the President to coordinate the Federal activities in each declared State. The FCO will work with the SCO to identify overall requirements, including unmet needs and evolving support requirements, and coordinate these requirements with the ESFs.

The FCO will also coordinate public information, Congressional liaison, community liaison, outreach and donations activities, and will facilitate the provision of information and reports to appropriate users.

7. The FCO will head a regional interagency ERT, composed of ESF representatives and other support staff. The ERT provides initial response coordination with the affected State at the State Emergency Operations Center (EOC) or other designated State facility and supports the FCO and ESF operations in the field. The FCO will coordinate response activities with the ESF representatives on the ERT to ensure that Federal resources are made available to meet the requirements identified by the State.

8. A national interagency EST, composed of ESF representative and other support staff, will operate at FEMA headquarters to provide support for the FCO and the ERT.

9. The CDRG, composed of representatives from all departments and agencies under the Plan, will operate at the national level to provide guidance and policy direction on response coordination and operational issues arising from FCO and ESF response activities. The CDRG is also supported by the EST and will operate from FEMA headquarters.

10. Activities under the Plan will be organized at various levels to provide partial response and recovery (utilizing selected ESFs) or to provide full response and recovery (utilizing all ESFs).

B. Organization

The organization to implement the procedures under the Plan is composed of standard elements at the national and regional levels. The overall response structure is shown in Figure 3. It is designed to be flexible in order to accommodate the response and recovery requirements specific to the disaster. The response structure shows the compositions of the elements providing response coordination and response operations activities at the headquarters and regional levels, but does not necessarily represent lines of authority or reporting relationships. In general, national-level elements provide support to the regional-level elements which implement the on-scene response operations in the field.

1. National-level Response Structure

The national-level response structure is composed of national interagency coordination and operations support elements from the participating departments and agencies. Overall interagency coordination activities are supported by the CDRG and EST at FEMA Headquarters. These elements will be augmented by department and agency operations support elements at other locations. As shown in Figure 4,The national-level response structure is composed of the following specific elements:

a. Catastrophic Disaster Response Group

(1) The CDRG is the headquarters-level coordinating group which addresses policy issues and support requirements from the FCO and ESF response elements in the field. It is chaired by the FEMA Associate Director, SLPS, and includes representatives from the Federal departments and agencies which have responsibilities under the Plan. The CDRG addresses response issues and problems which require national-level decisions of policy direction. The CDRG may be augmented by officials from other organizations, not listed in the Plan, which have resources, capabilities, or expertise needed for the response effort.

(2) The CDRG will meet on an as-needed basis at the request of the CDRG Chairperson. Meetings, unless otherwise indicated, will be held at the Emergency Information and Coordination Center (EICC), located in FEMA Headquarters, Washington, DC.

b. Emergency Support Team

The EST is an interagency group comprised of representatives from each of the primary agencies, select support agencies and FEMA Headquarters staff. It operates from the FEMA EICC. Detailed procedures regarding the EST organization and operations are found in the "EST Organization and Operational Procedures" document published by FEMA.

(1) The EST:

(a) Supports the CDRG and assists in assuring interagency headquarters information and coordination support for response activities;

(b) Serves as the central source of information at the national level regarding the status of Federal response activities and helps disseminate information (through a JIC) to the media, Congress and the general public; and

(c) Provides interagency resource coordination support to the FCO and regional response operations. In this capacity, the EST provides coordination support for FCO, ERT and ESF activities, as necessary. ESF representatives from the primary agencies provide liaison between field operations, their respective emergency operations centers (if applicable) and headquarters activities. The EST also coordinates offers of donations, including unsolicited resources offered by various individuals and groups, with field elements for use in response operations.

(2) To accomplish the resources coordination function, the EST:

(a) Coordinates the acquisition of additional resources, which an ESF is unable to obtain under its own authorities, to support operations;

(b) Advises the CDRG regarding the need to resolve a resource conflict between two or more ESFs which cannot be resolved in the affected region(s); and

(c) Supports coordination of resources for multi-State and multi-regional disaster response and recovery activities.

c. Agency Operational Centers

In addition to supporting EST activities at the FEMA EICC, headquarters departments and agencies will conduct national-level response activities at their own EOCs.

2. Regional-level Response Structure

The regional-level response structure is composed of interagency elements operating from various locations. Initially, representatives from the ESFs and FEMA will assemble at the ROC located at the FEMA Regional Office (or Federal Regional Center) . As needed, an Advance Element of the Emergency Response Office (or Federal Regional Center). As needed, an Advance Element of the Emergency Response Team (ERT-A) will deploy to the field to assess or begin response operational as required. When fully operational, the regional-level response structure will include the FCO and ERT in a DFO, with regional ESFs conducting response operations to provide assistance to each affected State. The regional structure is depicted in Figure 5.

a. Regional Operations Center

The ROC is activated by the Regional Director at a FEMA Regional Office. It is staffed by FEMA and representatives from the primary agencies and other agencies, as needed, to initiate and support Federal response activity. The ROC:

(1) Gathers damage information regarding the affected area;

(2) Serves as a point-of-contact for the affected State(s), national EST and Federal agencies;

(3) Establishes communications links with the affected State(s), national EST and Federal agencies;

(4) Supports deployment of the ERT(s) to field locations;

(5) Implements information and planning activities (under ESF #5); and

(6) Serves as a initial coordination office Federal activity until the ERT is established in the DFO in the field.

(7) Supports coordination of resources for multi-State and multi-regional disaster response and recovery activities, as needed. The organization of the ROC is shown in Figure 6.

b. Emergency response Team

The ERT is the interagency group that provides administrative, logistical, and operational support to the regional response activities in the field. The ERT includes staff from FEMA and other agencies who support the FCO in carrying out interagency activities. The ERT also provides support for the dissemination of information to the media, Congress and the general public. Each FEMA Regional Office is responsible for rostering an ERT and developing appropriate procedures for its notification and deployment.

(1) Advance Element of the Emergency Response Team

The ERT-A is the initial group to respond in the field to an incident. It is the nucleus of the full ERT which operates from the DFO. As shown in Figure 7 and Figure 8, the Advance Element is headed by a team leader from FEMA and is composed of FEMA program and support staff and representatives from selected ESF primary agencies. It is organized with Administration and Logistics, Information and Planning, and Operations groups and includes staff for public information, congressional liaison, and community liaison activities, as required.

(a) A part of the ERT-A will deploy to the State EOC or the other locations to work directly with the State to obtain information on the impact of the event and to begin identifying specific State requirements for Federal response assistance.

(b) Other members of the Advance Element, including leasing, communications and procurement representatives, and logistical and other support staff from FEMA, the General Services Administration (GSA), the Federal Emergency Communications Coordinator (FECC) or a representative, and the Forest Service, as required, will deploy directly to the disaster site to identify or verify the location for a DFO; establish communications; and set up operations, including the establishment of one or more Mobilization Centers, as required.

(2) Structure of the ERT

As shown in Figure 9 and Figure 10, the ERT is composed of the following elements:

(a) Federal Coordinating Officer

The FCO is appointed on behalf of the President by the Director, FEMA. The FCO heads the ERT and is supported in the field by staff carrying out public information, congressional liaison, community relations, outreach (to disaster victims) and donations coordination activities. The FCO:

(1) Coordinates overall response and recovery activities with the State;

(2) Works with the SCO to determine State support requirements and to coordinate these requirements with the ESFs;

(3) Tasks ESFs or any Federal agency to perform missions in the Plan and to perform additional missions not specifically addressed in the Plan; and

(4) Coordinates response issues and problems with the CDRG which require national-level decisions or policy direction.

(b) Administration and Logistics

This element includes activities which provide facilities and services in support of response operations, as well as for recovery activities, Includes the DFO support functions of administrative services, fiscal services, computer support and a message center.

(c) Information and Planning

This element includes information and planning activities to support operations. It includes functions to collect and process information; develop information into briefings, reports, and other materials; display pertinent information on maps , charts and status boards; consolidate information for action planning; and provide technical services in the form of advice on specialized areas in support of operations.

(d) Response Operations

This element includes the ESFs which are activated to provide direct response assistance in support of State requirements. The functions include ESF #1 - Transportation, ESF #2 - Communications, ESF #3 - Public Works and Engineering, ESF #4 - Firefighting, ESF #6 - Mass Care, ESF #7 - Resource Support, ESF #8 - Health and Medical Services, ESF #9 - Urban Search and Rescue, ESF #10 - Hazardous Materials, ESF#11 - Food, and ESF #12 - Energy. Each ESF is responsible for assessing State-identified Federal assistance requirements and resource requests and to organize and direct appropriate ESF response operations. The ESF primary agency will identify the functional support requirements to be provided by itself, support agencies and other ESFs.

(e) Recovery Operations

This Element includes the program activities of FEMA and other Federal agencies (OFAs) which provide disaster recovery assistance. This consists of Individual Assistance (including temporary housing, grants and loans to individuals, families and businesses); Public Assistance (including debris clearance, the repair or replacement of roads, streets and bridges and the repair or replacement of water control facilities, public buildings and related equipment, public utilities and the repair or restoration of recreational facilities and parks); and Hazard Mitigation Assistance (including measures to lessen or avert the threat of future disasters).

(d) Defense Coordinating Officer

The Defense Coordinating Officer (DCO) function is supported by the DOD. The DCO is provided by the DOD to serve in the field as the point of contact to the FCO and the ESFs regarding requests for military assistance. The DCO and staff coordinate support and provide liaison to the ESFs.

C. Notification

1. FEMA may receive initial notification or warning of a disaster from multiple sources, including the National Earthquake Information Service (NEIS) of the United States Geological Survey (USGS); the National Weather Service (NWS) (including the National Hurricane Center, the Severe Storms Forecast Center and the River Forecast Center); the Office of Territorial Affairs of the Department of the Interior; The Nuclear Regulatory Commission Operations Center; the FEMA National Warning Center; a FEMA Regional Office; a State Emergency Operations Center; or the news media.

2. Upon the determination of the occurrence of a disaster or emergency, the FEMA National Emergency Coordination Center (NECC) will notify key FEMA headquarters and regional officials. If there is a need for activation of response structures of the Plan, the NECC will notify CDRG and EST members at the national level, as required. The NECC will also notify the National Response Center, as appropriate. At the regional level, the appropriate Regional Director will notify members of the regional ERT.

3. Upon notification by FEMA, each agency is responsible for conducting its own internal national and regional notifications.

4. CDRG members may be called to assemble at the FEMA EICC for an initial meeting. CDRG members or alternates must be available at the call of the CDRG Chairperson to meet at any time during the initial response period, as necessary.

5. Detailed Federal headquarters and regional response notification action as are described in regional and headquarters procedures.

D. Activation

1. The Plan will be utilized to address particular requirements of a given disaster or emergency situation. Selected ESFs will be activated based on the nature and scope of the event and the level of Federal resources required to support State and local response efforts.

2. Once a response requirement is identified, some or all of the structures of the Plan will be activated. This includes the establishment of the EST at headquarters level, the activation of some or all of the ESFs and the deployment of an ERT from the regional office. The sequence of actions that will be taken at the national level and at the regional level upon activation of the Plan is shown is Figure 11.

3. At the national level, the FEMA Associate Director, SLPS, in consultation with the FEMA Director, has the authority to activate part or all of the response structures at the headquarters level to address the specific situation.

4. At the regional level, a FEMA Regional Director, in consultation with the Associate Director, SLPS and the FEMA Director, also may activate part or all of the response structures of the Plan within the Region for the purpose of providing response support to an affected State.

5. Based on requirements of the situation, FEMA headquarters and regional offices will notify Federal departments and agencies regarding activation of some or all of the ESFs and other Structures of the Plan. Priority for notification by FEMA will be given to contacting primary agencies.

E. Deployment

When activated, ESFs and other operational elements will take actions to identify, mobilize and deploy personnel and resources to support regional and national response operations, including the ROC and ERT activities in the regions and CDRG and EST activities in FEMA headquarters.

V. RESPONSE ACTIONS

A. Initial Actions

1. Headquarters Actions

   a. The FEMA Director will provide information on the requirements for Federal response assistance to the White House and to senior-level Federal Government officials, as required. The FEMA Associate Director, SLPS, will activate the EST and convene the CDRG, as appropriate. A JIC will be established, as required.

   b. The interagency EST will assemble in the FEMA EICC within two hours of notification to initiate headquarters interagency operations. The EST will provide support for regional response activities, as needed.

   c. At the call of the CDRG Chairperson, the CDRG will convene in the FEMA EICC. Members will report on their agency deployment actions and initial activities in support of the ESFs.

   d. Federal departments and agencies may activate their headquarters EOCs to provide coordination and direction to regional response elements in the field.

   e. FEMA will take the necessary actions to expedite the processing of a Governor's request for a Presidential major disaster or emergency declaration.

2. Regional Actions

   a. Upon the occurrence of an event that requires or may require a federal response, the FEMA Regional Director will initiate Federal response activities from the Regional Office.

   b. FEMA and other Federal agencies will activate a ROC and establish links with the affected State until the ERT is established in the field.

   c. The FEMA Regional Director, with the support of the ESFs, will initially deploy members of the ERT-A to the affected state for the purpose of assessing the impact of the situation, collecting damage information and determining response requirements. The Regional Director will coordinate the Federal support of State requirements until the FCO assumes those responsibilities. A JIC will be established, as required.

d. ESFs will take actions to quickly determine the impact of the disaster on their own capabilities and will identify, mobilize, and deploy resources to support response activities in the affected State.

B. Continuing Actions

1. Headquarters Actions

a. The EST will establish communications with the FEMA Region and with the DFO. The EST will provide liaison between the national-level participating departments and agencies for response operations support, including coordination of national-level resource requirements.

b. The FEMA headquarters JIC will support the JIC in the field, as required.

c. The Congressional Affairs staff, from FEMA and supporting departments and agencies, will conduct briefings for Members of Congress and their staffs, consistent with the Congressional Liaison element of the ERT.

d. Federal agencies will support ESF activities, as directed by the directed by the designated primary agencies.

2. Regional Actions

a. The FCO will provide overall coordination of Federal response activities with the SCO of the affected State.

b. Each ESF will establish contact with its State response counterpart to determine the specific requirements for Federal assistance and will provide appropriate response to the ESF missions. Each ESF will designate a representative to coordinate ESF activities with the FCO.

VI. RESPONSIBILITIES

A. Federal Emergency Management Agency

1. At FEMA Headquarters, several offices have responsibilities for developing, exercising, and maintaining the Plan and implementing the Federal response at the national level.

a. The Office of the Director, in consultation with the Associate Director, SLPS, and the appropriate Regional Director, is responsible for implementing FEMA Headquarters response actions under the Plan. The Director also is responsible , by delegation from the President, for appointing an FCO for each declared State.

b. The State and Local Programs and Support Directorate is responsible for providing overall coordination of the planning process and establishing a Federal response program for periodic exercise and Plan review. The Office of Emergency Management, SLPS is responsible for coordinating overall planning and response activities under the Plan. The Office of Emergency Management is also responsible for the design and implementation of procedures for the Headquarters EST, and in coordination with the FEMA Regional Offices, is responsible to support the design and implementation of procedures for the Regional ERTs. The Office of Disaster Assistance Programs is responsible for processing a Governor's request for disaster assistance and for managing Federal recovery activities under a disaster declaration.

c. The National Preparedness Directorate is responsible for alerting and notifying the EST and the CDRG through the NECC, providing an EST operational capability in the EICC, and providing a range of emergency support to the ERT through the FEMA Emergency Response Capability (FERC).

d. The External Affairs Directorate is responsible to support public affairs and Congressional relations activities under the Plan. The Office of Public Affairs is responsible for implementing public affairs activities under the Plan, including coordination the public information activities of other agencies utilizing one or more JICs. The Office of Congressional relations is responsible for establishing contact with Congressional offices representing the affected area and providing support for all aspects of Congressional relations, including providing personnel for headquarters and regional operations, conducting briefings and developing special legislation, as needed, to facilitate the response process,

e. The Office of Financial Management is responsible for developing guidance and procedures in concert with Plan agencies regarding the dispositions and accounting of funds. This includes providing a funding code for reimbursement of eligible expenditures related to P.L.93-288 activities, establishing a Letter of Credit mechanism to ensure rapid availability and transfer of funds to Federal and State organizations, when required, and processing requests for supplemental appropriations, as needed.

f. The Office of General Counsel is responsible for providing legal advice to the CDRG Chair and coordinating with other agencies regarding P.L. 93-288 authorities and other agency emergency authorities and directives. The Office will coordinate the perpetration of emergency legislation required to support the response effort.

g. The Office of Administrative Services and the Office of Operations Support are responsible for providing administrative and logistical support for headquarters response activities, including support for the EST and the CDRG.

2. In the FEMA Regions, each FEMA Regional Director is responsible for implementing activities of the Plan. This includes coordinating the development of an interagency response capability, the development and maintenance of the regional supplements to the Plan, ESF Appendices, and Standard Operating Procedures (SOPs). The Regional Director is also responsible for exercising the Plan in the Region and for implementing Federal response activities under the Plan during an actual Event.

B. Primary Agencies

1. At the national level, primary agencies are responsible to plan and coordinate with their support agencies for the delivery of ESF-related assistance. Primary agencies are responsible for preparing and maintaining the ESF annexes and appendices to the Plan to reflect the policies, procedures regarding assistance to be provided, and associated responsibilities of the designated primary and support agencies. Each primary agency at the national level will:

a. Designate an official to serve as a representative to the CDRG;

b. Designate staff to serve as a point-of-contact on the EST for ESF activities and to provide support for Congressional relations, public information and financial management activities, as required;

c. Designate an official at the headquarters level and in each FEMA Region to be responsible for the development of planning and procedures for each ESF;

d. Provide direction and assistance to national and regional elements tasked to assist with planning and response operations;

e. Participate in the process of developing and exercising the Plan; and

f. Coordinate the development of supplemental material to the Plan, including national and regional plan annexes, appendices and other supplements describing specific policies and procedures for response operations.

2. At the regional level, primary agencies will work with their support agencies to provide assistance to the State and to other ESFs, as may be required. Primary agencies will use the ESF annexes of the Plan as a basis for developing regional appendices to the ESF annexes and regional SOPs to support response activities.

C. Support Agencies

Support agencies will assist the primary agencies in preparing and maintaining ESF annexes and appendices, developing national and regional operating procedures, and providing support for ESF operations. Each support agency will:

1. Designate the headquarters-level office which will serve as the primary point of contact for all actions relating to the Plan;

2. Participate in the process of exercising, reviewing, maintaining and implementing the Plan; and

3. Designate representatives to serve on the CDRG and to staff ESF field operation at the DFO and at other operational locations.

D. Other Federal Agencies

Other Federal departments and agencies may have the authorities, resources, capabilities or expertise that may be required to support response operations, but that have not been formally designated under the Plan. Those organizations may requested to participate in Federal planning and response operations and asked to designate staff to serve as representatives to the CDRG, and to provide support to response operations in the field.

Functional Annexes:

ESF #1 - Transportation

ESF #2 - Communication

ESF #3 - Public Works and Engineering

ESF #4 - Firefighting

ESF #5 - Information and Planning

ESF #6 - Mass Care

ESF #7 - Resource Support

ESF #8 - Health and Medical Services

ESF #9 - Urban Search and Rescue

ESF #10 - Hazardous Materials

ESF #11 - Food

ESF #12 - Energy

Support Annexes:

FM - Financial Management

PI - Public Information

CR - Congressional Relations

APPENDIX D

TERRORISM INCIDENT ANNEX

Federal Emergency Management Agency

Federal Response Plan

Notice of Change

Date:	Number:	Subject:
February 7, 1997	FEMA 229, Chg 11	Terrorism

1. **Purpose**. This notice of change adds a Terrorism Incident Annex to the Federal Response Plan (FRP), which will be used to implement Presidential Decision Directive 39 (PDD-39).

2. **Background**. PDD-39 defines policies regarding the Federal response to threats or acts of terrorism involving nuclear, biological, and/or chemical material, and/or weapons of mass destruction (NBC/WMD). PDD-39 directs the undersigned departments and agencies to perform specific responsibilities that may affect the performance of their responsibilities under the FRP.

3. **Supersession**. None.

4. **Action Required**. Insert pages TI-1 through TI-22 after page CR-22.

5. **Distribution**. All Federal departments and agencies with FRP responsibilities.

6. **Additional Copies**. May be obtained by contacting FEMA Printing and Publications at (202) 646-3484.

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Assistant Secretary of the Army
(Installations, Logistics, and Environment)
Department of Defense

Philip R. Lee, M.D.
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Department of Energy

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Office of Solid Waste and Emergency Response
Environmental Protection Agency

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Response and Recovery Directorate
Federal Emergency Management Agency

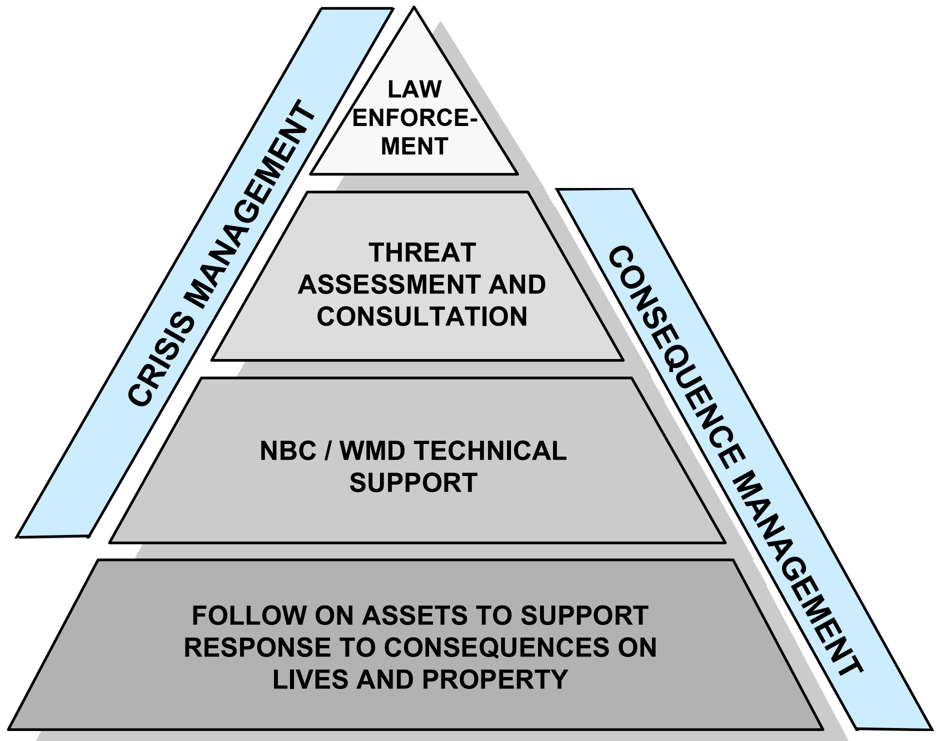
TERRORISM
INCIDENT ANNEX

I. INTRODUCTION

In June 1995, the White House issued Presidential Decision Directive 39 (PDD-39), "*United States Policy on Counterterrorism.*" PDD-39 directed a number of measures to reduce the Nation's vulnerability to terrorism, to deter and respond to terrorist acts, and to strengthen capabilities to prevent and manage the consequences of terrorist use of nuclear, biological, and chemical (NBC) weapons including weapons of mass destruction (WMD). PDD-39 discusses crisis management and consequence management.

Crisis management includes measures to identify, acquire, and plan the use of resources needed to anticipate, prevent, and/or resolve a threat or act of terrorism. The laws of the United States assign primary authority to the Federal Government to prevent and respond to acts of terrorism; State and local governments provide assistance as required. Crisis management predominantly a law enforcement response. Based on a the situation, a Federal crisis management response may be supported by technical operations, and by Federal consequence management, which may operate concurrently (see **Figure 1**).

Consequence management includes 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. The laws of the United States assign primary authority to the States to respond to the consequences of terrorism; the Federal Government provides assistance as required.



source: DHHS-PHS / FEMA

Figure 1 - Relationship between Crises and Consequence Management

A. Purpose

The purpose of this Terrorism Incident Annex, hereafter referred to as the Annex, is to describe the Federal concept of operations to implement PDD-39, when necessary, to respond to terrorist incidents within the United States. The Annex:

1. Describes crisis management. Guidance is provided in other Federal plans.

2. Defines the policies and structures to coordinate crisis management with consequence management.

3. Defines consequence management, which uses Federal Response Plan (FRP) structures, supplemented as necessary by structures that are normally activated through other Federal plans.

B. Scope

1. The Annex applies to all threats or acts of terrorism within the United States that the White House determines require a Federal response.

2. The Annex applies to all Federal departments and agencies that may be directed to respond to a threat or act of terrorism within the United States.

3. The Annex builds upon FRP concepts and procedures by addressing unique policies, assumptions, structures, responsibilities, and actions that will be applied for consequence management as necessary.

II. POLICIES

A. Lead Agency Responsibilities. PDD-39 validates and reaffirms existing Federal Lead Agency responsibilities for counterterrorism, which are assigned to the Department of Justice, as delegated to the Federal Bureau of Investigation (FBI), for threats or acts of terrorism within the United States. It is FBI policy that crisis management will involve only those Federal agencies requested by the FBI to provide expert guidance and/or assistance, as described in the PDD-39 Domestic Guidelines (classified) and FBI Incident Contingency Plans (classified).

B. Consequence Management. PDD-39 states that the Federal Emergency Management Agency (FEMA) shall ensure that the FRP is adequate to respond to the consequences of terrorism. FEMA, with the support of all agencies in the FRP, shall act in support of the FBI in Washington, DC, and on the scene of the crisis, until such time as the Attorney General shall transfer the Lead Agency role to FEMA (see **Figure 2**). FEMA retains responsibility for consequence management throughout the Federal response, and acts in support response of the FBI as appropriate, until the Attorney General, in consultation with the FBI Director and the FEMA Director, determines that such support is no longer required. It is FEMA policy to use FRP structures to coordinate all Federal assistance to State and local governments for consequence management.

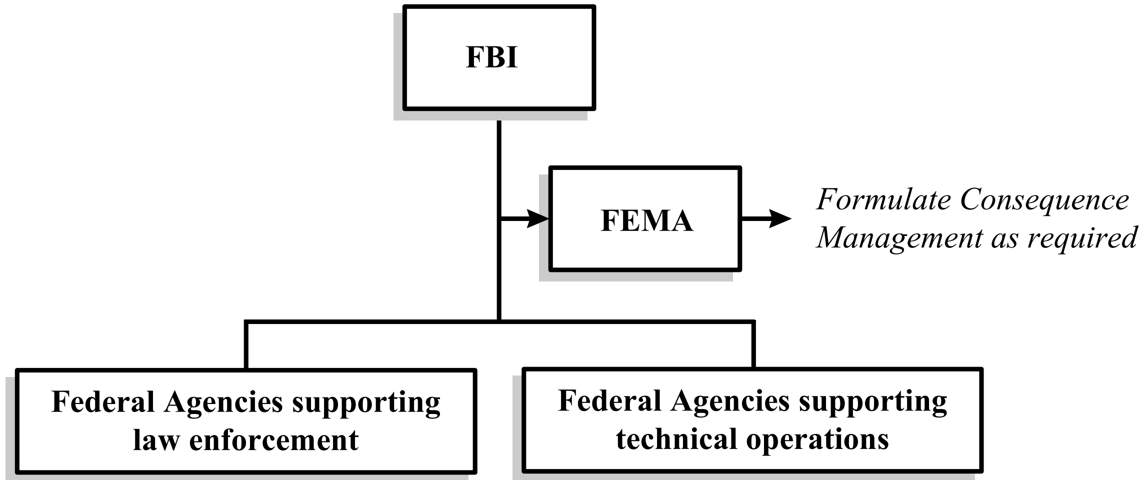


Figure 2 - Relationship Among Federal Agencies Under PDD-39

C. Costs. PDD-39 states that Federal agencies directed to participate in the resolution of terrorist incidents or conduct of counterterrorist operations shall bear the costs of their own participation, unless otherwise directed by the President.

III.SITUATION

A. Conditions

1. A general concern or actual threat of an act of terrorism occurring at or during a special event within the United States may cause the President to direct Federal agencies to implement precautionary measures which may include some of the consequence management actions described in this Annex. When directed, FEMA will coordinate with the FBI and the affected State to identify potential consequence management requirements and with Federal consequence management agencies to implement increased readiness operations.

2. A ***significant threat*** or act of terrorism may cause the FBI to respond and to implement a crisis management response as described in this Annex. FBI requests for assistance from other Federal agencies will be coordinated through the Attorney General and the President with coordination of NSC groups as warranted. During the course of a crisis management response, consequences may become imminent or occur that cause the President to direct FEMA to implement a consequence management response as described in this Annex.

3. The occurrence of an incident without warning that produces major consequences involving NBC/WMD may cause the President to direct FEMA to implement consequence management response as described in this Annex.

B. Planning Assumptions

1. No single agency at the local, State, Federal or private level possesses the authority and the expertise to act unilaterally on many difficult issues that may arise in response to threats or acts of terrorism, particularly if NBC/WMD are involved.[1]

2. An act of terrorism, particularly an act directed against a large population center within the United States involving NBC/WMD, may produce major consequences that would overwhelm the capabilities of may local and State governments almost immediately. Major consequences involving NBC/WMD may overwhelm existing Federal capabilities as well.

3. Local, State, and Federal responders may define working perimeters -- that may overlap to some degree. Perimeters may be used to control access to the area, target public information messages, assign operational sectors among responding organizations, and assess potential effects on the population and the environment. Control of these perimeters may be enforced by different authorities, which may impede the overall response if adequate coordination is not established.

4. If protective capabilities are not available, responders cannot be required to put their own lives at risk in order to enter a perimeter contaminated with NBC material. It is possible that the perimeter will be closed until the effects of the NBC material have degraded to levels that are safe for first responders.

5. This Annex may be implemented in situations involving major consequences in a single State or multiple States. The FBI will establish coordination relationships among FBI Field Offices and with Federal agencies supporting crisis management, including FEMA based on the locations involved.[2]

6. This Annex may be implemented in situations that also involve consequences in neighboring nations.

IV. CONCEPT OF OPERATIONS

A. Crisis Management

(FBI, National Security Division, Domestic Terrorism/Counterterrorism Planning Section)

PDD-39 reaffirms the FBI's Federal lead responsibility for crisis management response to threats or acts of terrorism that take place within United States territory or in international waters and do not involve the flag vessel of a foreign country. The FBI provides a graduated flexible response to a range of incidents, including:

- A credible threat, which may be presented in verbal, written, intelligence-based or other form.

- An act of terrorism which exceeds the local FBI field division capability to resolve.

- The confirmed presence of an explosive device or WMD capable of causing a significant destructive event, prior to actual injury or property loss (e.g., a *"**significant threat**"*).

- The detonation of an explosive device, utilization of a WMD, or other destructive event, with or without warning, that results in limited injury or death (e.g., *"**limited consequences / State and local consequence management response**"*).

- The detonation of an explosive device, utilization of a or other destructive event, with or without warning, that results in substantial injury or death (e.g., *"**major consequences / Federal consequence management response**"*).

In response to a credible threat involving -- NBC/WMD, the FBI initiates a threat assessment process that involves close coordination with Federal agencies with technical expertise, in order to determine the viability of the threat from a technical, as well as tactical and behavioral standpoint.

The FBI provides the initial notification to law enforcement authorities within the affected State of a threat or occurrence that the FBI confirms as an act of terrorism. If warranted, the FBI implements an FBI response and simultaneously, advises the Attorney General, who notifies the President and NSC groups as warranted, that a Federal crisis management response is required. If a Federal crisis management response is authorized, the FBI activates multi-agency crisis management structures at FBI Headquarters, the responsible FBI Field Office, and at the incident site (see **Figure 3**). *(The FBI provides guidance on the crisis management response in the FBI Nuclear*

Incident Contingency Plan (classified) and the FBI Chemical/Biological Incident Contingency Plan (classified)).

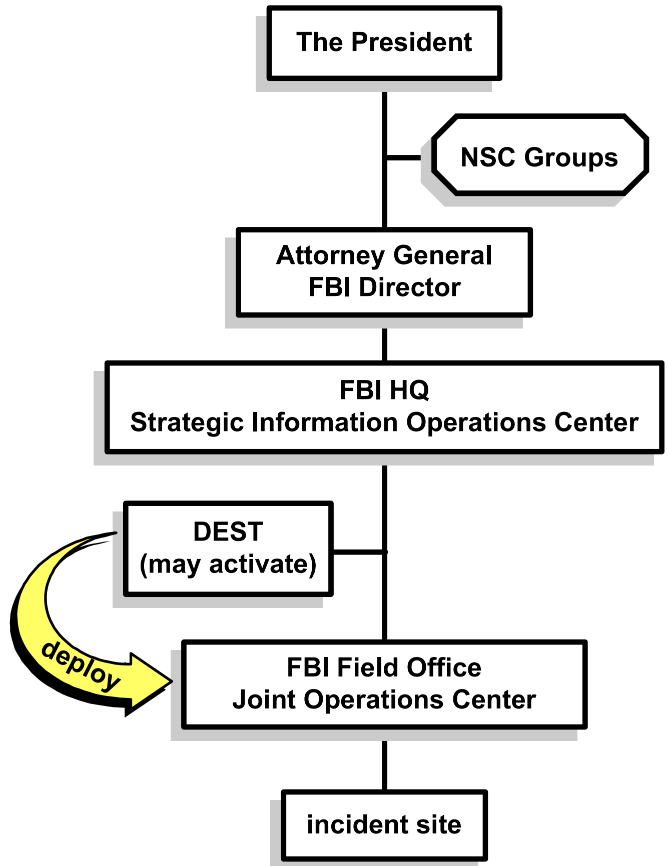


Figure 3 - Multi-Agency Crisis Management Structures

If the threat involves NBC/WMD, the FBI Director may recommend to the Attorney General, who notifies the President and NSC groups as warranted, to deploy a Domestic Emergency Support Team (DEST). The mission of the DEST is to provide expert advice and assistance to the FBI On-Scene Commander (OSC) related to the capabilities of the DEST agencies and to coordinate follow-on response assets. When deployed, the DEST merges into the existing Joint Operations Center (JOC) structure. *(Authorization and coordination procedures and the interagency organizational structure for the DEST are outlined in the PDD- 39 Domestic Guidelines (classified)).*

During crisis management, the FBI coordinates closely with local law enforcement authorities to provide a successful law enforcement resolution to the incident. The FBI also coordinates with other Federal authorities, including FEMA. The FBI Field Office responsible for the Incident site modifies its Command Post to function as a JOC. The JOC structure includes the following standard groups: Command, Operations, Support, and

Consequence Management. Representation within the JOC includes some Federal, State, and local agencies with roles in consequence management. FEMA notifies Federal, State and local consequence management agencies selected by the FBI OSC to request that they deploy representatives to the JOC. Selected Federal, State and local consequence management agencies may be requested to serve in the JOC Command Group, the JOC Support Group/Media component, and the JOC Consequence Management Group (see **Figure 4**, shaded boxes).

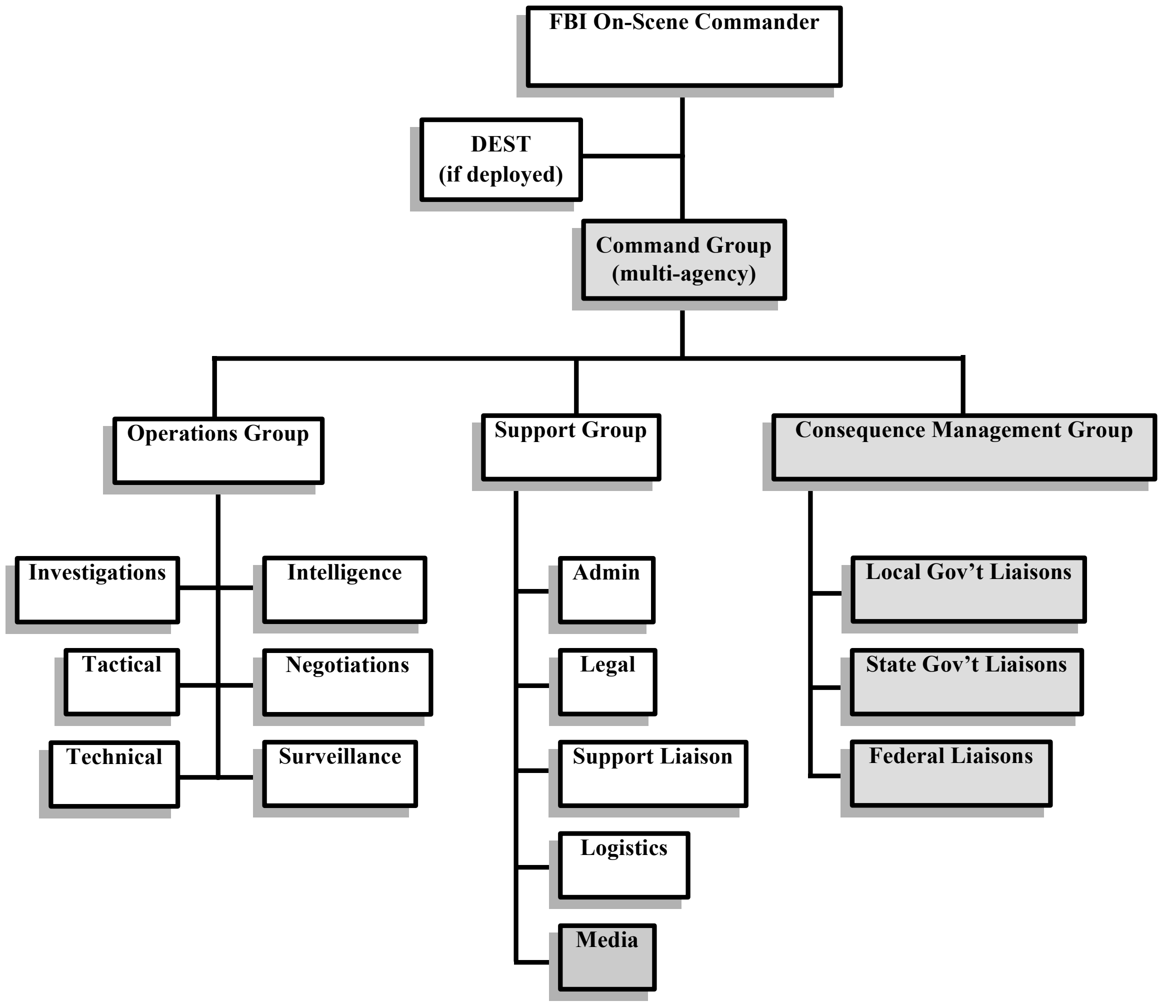


Figure 4 - FBI Joint Operations Center Structure

A FEMA representative coordinates the actions of the JOC Consequence Management Group, expedites activation of a Federal consequence management response should it become necessary, and works with an FBI representative who serves as the liaison between the Consequence Management Group and the FBI OSC. The JOC Consequence Management Group monitors the crisis management response in order to advise on decisions that may have implications for consequence management, and to provide continuity should a Federal consequence management response become necessary.

B. Consequence Management

1. Pre-Incident

The FBI may notify Federal agencies, including FEMA, of a *significant threat* of an act of terrorism. Federal agencies requested by the FBI, including FEMA, will deploy a representative(s) to the FBI Headquarters Strategic Information Operations Center (SIOC). Based on the circumstances, FEMA Headquarters and the responsible FEMA Region(s) may implement a standard procedure to alert involved FEMA officials and Federal agencies supporting consequence management. FEMA and other Federal agencies requested by the FBI OSC will deploy representatives to the JOC(s) being established by the responsible FBI Field Office(s).[3] Representatives may include a senior official to serve in the JOC Command Group, in order to assist the FBI OSC and to provide continuity in leadership should a Federal consequence management response be required.

Issues arising from the response that affect multiple agency authorities and areas of expertise will be discussed by the FBI OSC and the other members of the JOC Command Group, who are all working in consultation with other local, State and Federal representatives. While the FBI OSC retains authority to make Federal crisis management decisions at all times, operational decisions are made cooperatively to the greatest extent possible. The FBI OSC and the senior FEMA official will provide, or obtain from higher authority, an immediate resolution of conflicts in priorities for allocation of critical Federal resources (such as airlift or technical operations assets) between the crisis management and the consequence management response.

The JOC Command Group plays an important role ensuring coordination of Federal crisis management and consequence management actions. Coordination will also be achieved through the exchange of operational reports on the incident. Because reports prepared by the FBI are "law enforcement sensitive," FEMA representatives with access to the reports will review them, according to standard procedure, order to identify and forward information to Emergency Support Function (ESF) #5 that may affect operational priorities and action plans for consequence management.

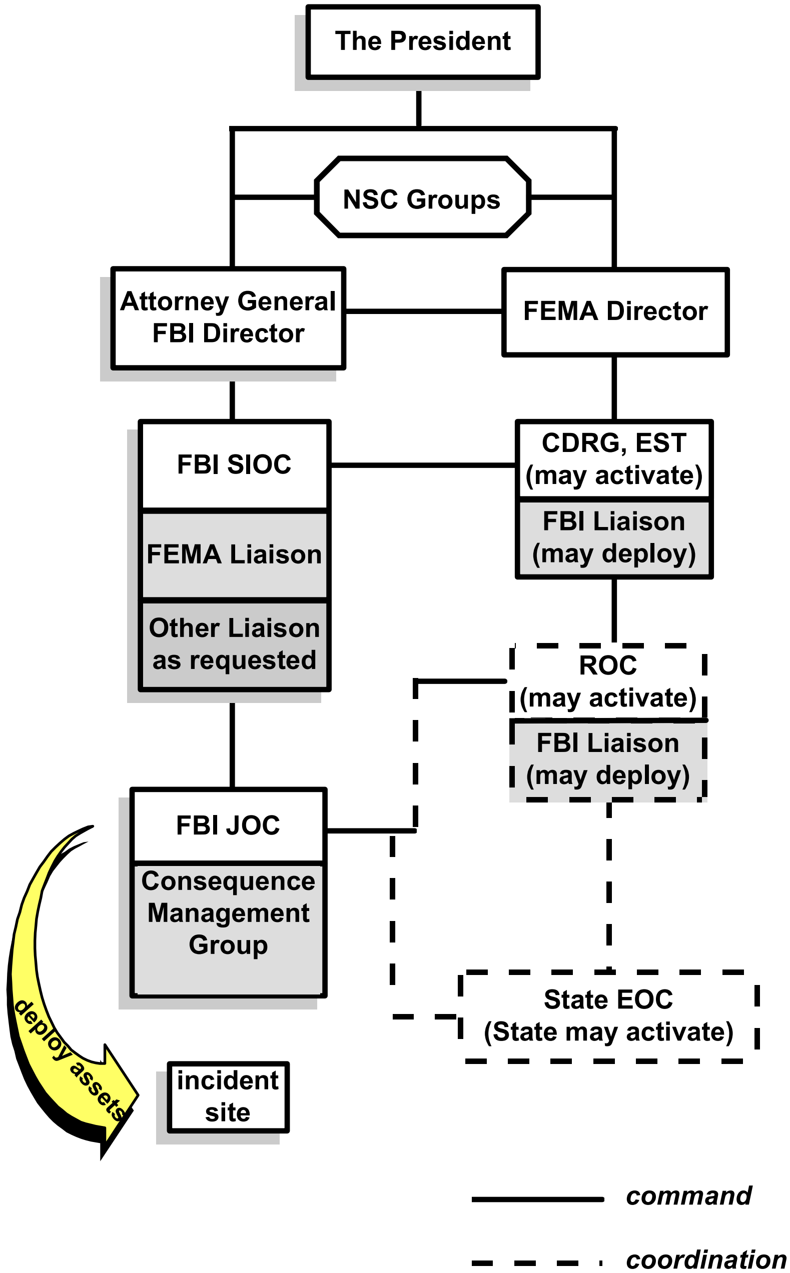


Figure 5 - Pre-Incident Consequence Management

As a situation progresses, consequences may become imminent. FEMA will consult immediately with the White House and the Governor's office in order to determine if FEMA is directed to use authorities of the Robert T. Stafford Disaster Relief and Emergency Assistance (Stafford) Act to mission-assign Federal consequence management agencies to pre-deploy assets, in order to lessen or avert the threat of a catastrophe. These actions will involve appropriate notification and coordination with the FBI, as the overall Federal Lead Agency for counterterrorism.

FEMA Headquarters may activate an Emergency Support Team (EST), may convene an executive-level meeting, of the catastrophe Disaster Response Group (CDRG), and may place an Emergency Response Team - National (ERT-N) on alert.[4] When FEMA activates the EST, FEMA will notify FBI Headquarters to request a liaison. The responsible FEMA Region(s) may activate a Regional Operations Center (ROC) and deploy a representative(s) to the affected State(s) (see **Figure 5**). When the responsible FEMA Region(s) activate a ROC, the Region(s) will notify the responsible FBI Field Office(s) to request a liaison.

2. *Trans-Incident*

(Situations involving a transition from a threat to an act of terrorism).

If consequences become imminent or occur that cause the President to direct FEMA to implement a Federal consequence management response, then FEMA will initiate procedures to activate additional FRP structures (the EST, the CDRG, the ROC, and a Disaster Field Office (DFO) if necessary). Federal, State and local consequence management of agencies will begin to disengage from the JOC (see **Figure 6**). The senior FEMA official and liaisons will remain at the JOC until the FBI and FEMA agree that a liaison presence is no longer required. FEMA will establish Joint Information Centers (JICs) in the field and Washington, DC, to serve as the primary Federal information centers on the consequence management response for the media, members of Congress, and foreign governments. FEMA JICs will establish coordination with the FBI Media component in the field and the FBI Headquarters National Press Office, which serve as the primary Federal information centers on the crisis management response.

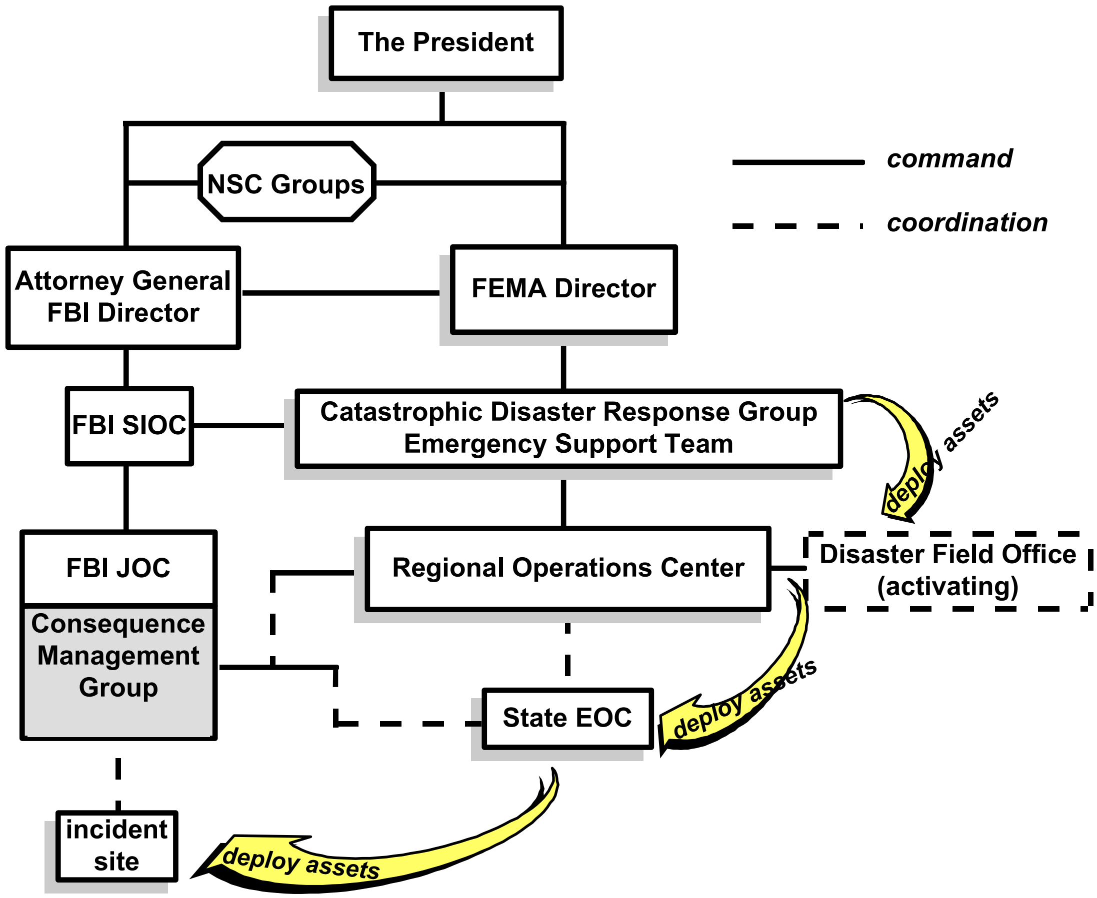


Figure 6 - Trans-Incident Consequence Management

3. Post-Incident

(Situations without warning).

If an incident occurs without warning that produces major consequences and appears to be caused by an act of terrorism, then FEMA and the FBI will initiate consequence management and crisis management actions concurrently. FEMA will consult immediately with the White House and the Governor's office to determine if a Federal consequence management response is required. If the President directs FEMA to implement a Federal consequence management response, then FEMA will implement portions of this Annex and other FRP annexes as required. FEMA will support the FBI as required and will lead a concurrent Federal consequence management response.

During the consequence management response, the FBI provides a liaison to either the ROC Director or the Federal Coordinating Officer (FCO) in the field, and a liaison to the EST Director at FEMA Headquarters (see **Figure 7**). Issues arising from the response that affect multiple agency authorities and areas of expertise will be discussed by the ROC Director or FCO, in consultation with the FBI liaison, the on-scene decision makers of the Federal agencies supporting the technical operation, and the ESF Leaders, who are all working in consultation with local, State and other Federal representatives. While the ROC Director or FCO retains authority to make Federal consequence management decisions at all times, operational decisions are made cooperatively to the greatest extent possible. Meetings will continue to be scheduled until the FBI and FEMA agree that coordination is no longer required. Operational reports will continue to be exchanged, as described in the pre-incident phase. The FBI liaisons will remain at the EST and the ROC or DFO until FEMA and the FBI agree that a liaison presence is no longer required.

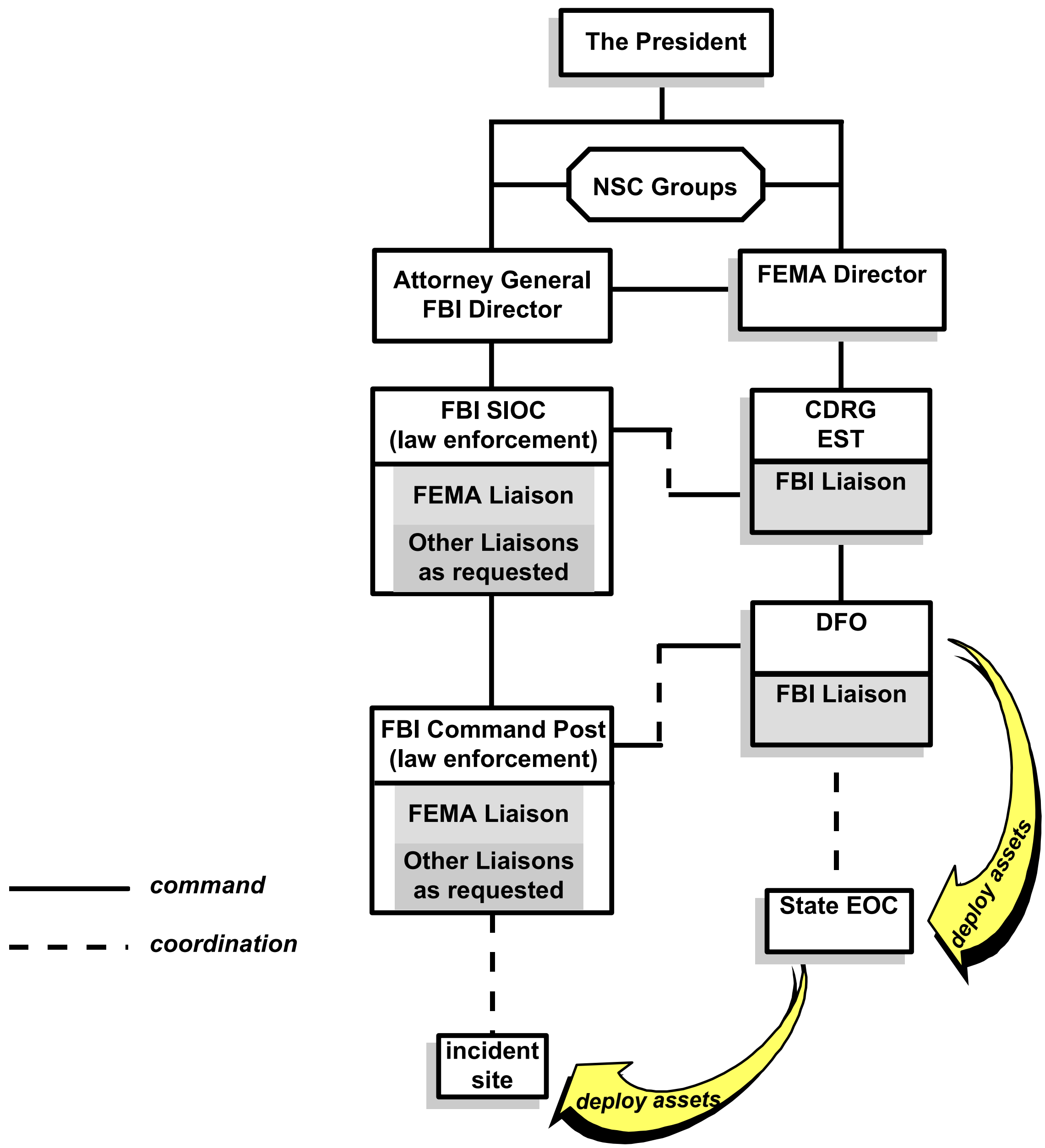


Figure 7 - Post-Incident Consequence Management

4. Disengagement

If an act of terrorism does not occur, then the consequence management response disengages when the FEMA Director, in consultation with the FBI Director, directs FEMA Headquarters and the responsible Region(s) to issue a cancellation notification by standard procedure to appropriate FEMA officials and FRP agencies. FRP agencies disengage according to standard procedure.

If an act of terrorism occurs that results in major consequences, then each FRP structure (the EST, the CDRG, the ROC. and the DFO if necessary) disengages at the appropriate time according to standard procedures. Following FRP disengagement, operations by individual Federal agencies or by multiple Federal agencies under other Federal plans may continue, in order to support the affected State and local government with long-term hazard monitoring, environmental decontamination, and site restoration (clean-up).

V. RESPONSIBILITIES

A. FBI

PDD-39 clarifies and expands upon the responsibilities of the FBI as the Federal Lead Agency for crisis management. The FBI will:

- Appoint an FBI OSC to provide leadership and direction to the Federal crisis management response. The FBI OSC will convene meetings with decision makers representing FEMA, the Federal agencies involved in technical operations, and the State (as appropriate). These meetings will be held in order to formulate incident action plans, define priorities, review status, resolve conflicts, identify issues that require decisions from higher authorities, and evaluate the need for additional resources.

- Issue and track the status of crisis management actions assigned to Federal agencies. A common system should be used by the FBI and FEMA, in order to provide a capability to control, prioritize, and deconflict taskings to Federal agencies, several of which support crisis management and consequence management.

- Establish the primary Federal operations centers for crisis management in the field and Washington, DC.

- Establish the primary Federal centers for information management response for the media, members of Congress, and foreign governments in the field and Washington, DC.

- Designate appropriate liaison and advisory personnel to support FEMA.

- Determine when a threat of an act of terrorism warrants consultation with the White House.

- Advise the White House, through the Attorney General, when the FBI requires assistance for a Federal crisis management response, in accordance with the PDD-39 Domestic Guidelines.

- Coordinate the Federal crisis management response with the lead State and local crisis management agencies.

B. FEMA

PDD-39 clarifies and expands upon the responsibilities of FEMA as the Federal Lead Agency for consequence management. FEMA will:

- Appoint a ROC Director or FCO to provide leadership and direction to the Federal consequence management response. The ROC Director or FCO will convene meetings with decision makers representing the FBI, the Federal agencies involved in technical operations, and the State (as appropriate). These meetings will be held in order to formulate incident action plans, define priorities, review status, resolve conflicts, identify issues that require decisions from higher authorities, and evaluate the need for additional resources.

- Issue and track the status of consequence management actions assigned to Federal agencies. A common system should be used by the FBI and FEMA, in order to provide a capability to control, prioritize, deconflict, and (as appropriate) audit and reimburse taskings to Federal agencies, several of which support crisis management and consequence management.

- Establish the primary Federal operations centers for consequence management in the field and Washington, DC.

- Establish the primary Federal centers for information on consequence management response for the media, members of Congress, and foreign governments in the field and Washington, DC.

- Designate appropriate liaison and advisory personnel to support the FBI.

- Determine when consequences are imminent that warrant consultation with the White House and the Governor's office.

- Consult with the White House and the Governor's office to determine if a Federal consequence management response is required and if FEMA is directed to use Stafford Act authorities. This process will involve appropriate notification and coordination with the FBI.

- Coordinate the Federal consequence management response with the lead State and local consequence management agencies.

C. Federal Agencies Supporting Technical Operations

1. Department of Defense

As directed in PDD-39, the Department of Defense (DOD) will activate technical operations capabilities to support the Federal response to threats or acts of NBC/WMD terrorism. As required under the Constitution and laws of the United States, DOD will coordinate military operations within the United States with the appropriate civilian lead agency(ies) for the technical operations.

2. Department of Energy

As directed in PDD-39, the Department of Energy (DOE) will activate nuclear response capabilities to support the Federal response to threats or acts of nuclear/WMD terrorism. DOE may coordinate with individual agencies identified in the FRERP to use the structures, relationships, and capabilities described in the FRERP to support response operations. The FRERP does not require formal implementation. Under the FRERP:

- The Federal OSC under the FRERP will coordinate the FRERP response with the FEMA official (either the senior FEMA official at the JOC, the ROC Director or the FCO). Who is responsible under PDD-39 for on-scene coordination of all Federal support to State and local governments (see **Figure 8**).

- The FRERP response may, include onsite management, radiological monitoring and assessment, development of Federal protective action recommendations, and provision of information on the radiological response to the public, the White House and Members of Congress, and foreign governments. The Lead Federal Agency (LFA) of the FRERP will serve as the primary Federal source of information regarding onsite radiological conditions and offsite radiological effects.

- The LFA/FRERP will issue taskings that draw upon funding from the responding FRERP agencies.

3. Department of Health and Human Services

As directed in PDD-39, the Department of Health and Human Services (DHHS) will activate health and medical response capabilities to support the Federal response to threats or acts of NBC/WMD terrorism. DHHS may coordinate with individual agencies identified in the *DHHS Health* *and Medical Services Support Plan for the Federal Response to Acts of Chemical/Biological Terrorism*, to use the structures, relationships, and capabilities described in the DHHS plan to support response operations. If the DHHS plan is formally implemented:

- The DHHS on-scene representative will coordinate, through the ESF #8 Leader, the DHHS plan response with the FEMA official (either the senior FEMA official at the JOC, the ROC Director or the FCO), who is responsible under PDD-39 for on-scene coordination of all Federal support to State and local governments (see **Figure 8**).

- The DHHS plan response may include threat assessment. consultation, agent identification, epidemiological investigations, hazard detection and reduction, decontamination, public health support, medical support, and pharmaceutical support operations.

- DHHS will issue taskings that draw upon funding from the responding DHHS plan agencies.

4. Environmental Protection Agency

As directed in PDD-39, the Environmental Protection Agency (EPA) will activate environmental response capabilities to support the Federal response to acts of NBC/WMD terrorism. EPA may coordinate with individual agencies identified in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) to use the structures, relationships, and capabilities of the National Response System as described in the NCP to support response operations. If the NCP is formally implemented:

- The On-Scene Coordinator under the NCP will coordinate, through the ESF #10 Leader, the NCP response with the FEMA official (either the senior FEMA official at the JOC, the ROC Director or the FCO), who is responsible under PDD-39 for on-scene coordination of all Federal support State and local governments (see Figure 8).

- The NCP response may include threat assessment, consultation, agent identification, hazard detection and reduction, environmental monitoring, decontamination, and long-term site restoration (environmental clean-up) operations.

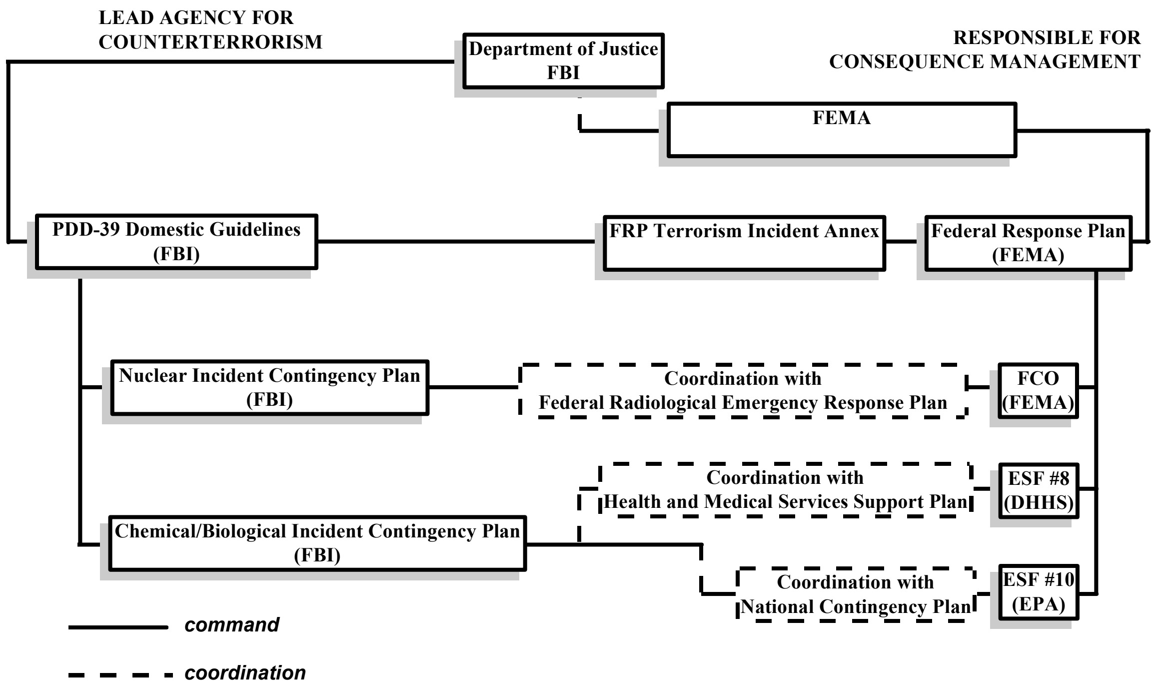


Figure 8 - Relationships Among Federal Plans to Implement PDD-39

VI. FUNDING GUIDELINES

As stated in PDD-39, Federal agencies directed to participate in the resolution of terrorist incidents or conduct of counterterrorist operations bear the costs of their own participation, unless otherwise directed by the President. This does not preclude Federal agencies from reallocating funds from current agency operating budgets, accepting reimbursable work orders offered by other Federal agencies, and/or submitting requests for supplemental appropriation to the Office of Management and Budget for consideration.

If the President directs FEMA to use Stafford Act authorities, FEMA will issue mission assignment through the RFP to support consequence management. FEMA provides the following funding guidance to the FRP agencies:

A. Special Events and the Stafford Act

Commitments by individual agencies to take precautionary measures in anticipation of special events will not be reimbursed under the Stafford Act, unless mission-assigned by FEMA to support consequence management.

B. Crisis Management/Law Enforcement and the Stafford Act

Stafford Act authorities do not pertain to law enforcement functions. Law enforcement or crisis management actions will not be mission-assigned for reimbursement under the Stafford Act.[5]

VII. REFERENCES (not otherwise referenced in the FRP)

A. Presidential Decision Directive 39 (classified). An unclassified extract may be obtained from FEMA.

B. FBI Chemical/Biological Incident Contingency Plan (classified). An unclassified version may be obtained from the FBI.

C. FBI Nuclear Incident Contingency Plan (classified). An unclassified version may be obtained from the FBI.

D. PDD-39 Domestic Guidelines (classified).

E. DHHS Health and Medical Services Support Plan for the Federal Response to Acts of Chemical/Biological Terrorism.

VIII. PRIMARY POINT OF CONTACT

Inquiries concerning this Annex should be addressed to the Federal Emergency Management Agency, Response and Recovery Directorate, Operations and Planning Division, Planning and Coordination Branch.[6, 7]

FOLLOW ON PLANNING REQUIREMENTS

1 FEMA will incorporate language into the FRP Basic Plan concerning the incident command system (ICS) and command structures.

2 FEMA will incorporate language into an FRP procedure and FEMA internal procedures for backup operations concerning support to multiple terrorism operations within a single State or in multiple States.

3 FEMA Headquarters will develop planning guidance for the FEMA Regions to incorporate language into the Regional Response Plans to explain that the senior FEMA Official at the JOC has the authority to expedite activation of a Federal consequence management response. Following a Stafford Act declaration, Federal consequence management operations will transition from the JOC Consequence Management Group, supported by the ROC, to a DFO.

[4] FEMA will incorporate language into the FRP Basic Plan concerning the Emergency Response Team - National.

[5] FEMA will renew and update language concerning Stafford Act declaration assignments in the FRP Basic Plan as follows:

FEMA can use limited pre-deployment authorities in advance of a Stafford Act declaration to *"lessen or avert the threat of a catastrophe"*, only if the President expresses intent to go forward with a declaration (Section 201). This authority is further interpreted by Congressional intent, to the effect that the President must determine that assistance under existing Federal programs is inadequate to meet the crisis before FEMA may directly intervene under the Stafford Act.

The Stafford Act authorizes the President to issue *"emergency"* and *"major disaster"* declarations (Section 501). Emergency declarations may be issued in response to a Governor's request, or in response to those rare emergencies, including some acts of terrorism, for which the Federal Government is assigned in the laws of the United States the exclusive or preeminent responsibility and authority to respond. Major disaster declarations may be issued in response to a Governor's request for any natural catastrophe or, regardless of cause, any fire, flood or explosion which has caused damage of sufficient severity and magnitude, as determined by the President, to warrant major disaster assistance under the Act.

If a Stafford Act declaration is provided, funding for consequence management may continue to be allocated from responding department and agency operating budgets, the Disaster Relief Fund, and supplemental appropriations.

Mission assignments are reimbursable work orders issued by FEMA to Federal agencies directing completion of a specific task. While the Stafford Act states that *"Federal agencies may (emphasis added) be reimbursed for expenditures under the Act"* from the Disaster Relief Fund (Section 304), it is FEMA policy to reimburse Federal agencies for work performed under mission assignments. Mission assignments issued to support consequence management will follow FEMA's *"Standard Operating Procedures for the Management of Mission Assignments (May 1994)"* or applicable superseding documentation.

[6] FEMA will update FRP Appendix A. The following acronyms and abbreviations used in the Annex will be incorporated:

DEST	Domestic Emergency Support Team
FBI OSC	FBI On-Scene Commander
JOC	Joint Operations Center
NBC	Nuclear, Biological, and Chemical
NSC	National Security Council
PDD-39	Presidential Decision Directive 39

SIOC	Strategic Information Operations Center
WMD	Weapons Of Mass Destruction

[7] FEMA will incorporate these terms and definitions into the FRP Appendix B:

1. **Biological agents** are microorganisms or toxins from living organisms that have infectious properties which produce lethal or serious effects in plants and animals. (FBI)

2. **Chemical agents** are solids, liquids, or gases that have chemical properties that produce lethal or serious effects in plants and animals. (FBI)

3. **Limited consequences** are within State and local capabilities.

4. **Major consequences** exceed State and local capabilities, requiring a Federal response.

5. **Nuclear weapons** release nuclear energy in an explosive manner as the result of nuclear chain reactions involving fission and/or fusion of atomic nuclei. (DOE)

6. **Significant threat**. The confirmed presence of an explosive device or WMD capable of causing a significant destructive event, prior to actual injury or property loss. (FBI)

7. **Technical operations** include operations to identify, assess, dismantle, transfer, dispose, and decontaminate personnel and property exposed to explosive ordnance or NBC/WMD material.

8. **Terrorist Incident**. A violent act, or an act dangerous to human life, in violation of the criminal laws of the United States or of any State, to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives. (FBI)

9. **Weapon of Mass Destruction**. (A) Any destructive device as defined in section921 of this title, (which reads) any explosive, incendiary, or poison gas, bomb, grenade, rocket having a propellant charge of more than four ounces, missile having an explosive or incendiary charge of more than one quarter ounce, mine or device similar to the above, (B) poison gas, (C) any weapon involving a disease organism, or (D) any weapon that is designed to release radiation or radioactivity at a level dangerous to human life. (I8 U.S.C., Section 2332a)

APPENDIX E

FEDERAL BUREAU OF INVESTIGATION CHEMICAL / BIOLOGICAL INCIDENT CONTINGENCY PLAN

UNCLASSIFIED

FEDERAL BUREAU OF INVESTIGATION

CHEMICAL/BIOLOGICAL (C/B)
INCIDENT CONTINGENCY PLAN

(UNCLASSIFIED)

INTRODUCTION:

The first priority of the plan is public safety and the preservation of life. In a terrorist or other criminal-related C/B incident, the FBI will assume a central investigation and/or crisis management role, in association with local law enforcement authorities, to successfully resolve the incident. Concurrently, in a major incident, other specialized Federal entities from a variety of agencies and departments, will provide consequence management resources in support of state and local agencies. These resources are primarily designed to address health and safety issues, and include a wide variety of emergency support, including housing, food, and medical support.

The plan is designed to marshal the appropriate Federal tactical, technical, scientific, and medical support to bolster the FBI's investigative and crisis management abilities and to augment state and local resources in addressing the threat inherent in a C/B incident. The contingency plan emphasizes coordination between all participants and is particularly concerned with the bridge between law enforcement activities and the management of the medical consequences of the crisis.

If a terrorist or other criminal-related C/B incident should occur, the FBI will assume the lead Federal role to successfully resolve the incident and will closely coordinate efforts with appropriate local law enforcement agencies and other emergency authorities.

Based on the specific details of an incident, at some time during the crisis, the responsibility for consequence management and public safety will be transferred from the FBI to FEMA when the Attorney General (AG) determines that the priority law enforcement goals and objectives have been set or are outweighed by the consequence management concerns. The FBI's C/B Incident Contingency Plan attempts to clarify and address this issue and provides guidance regarding the Federal management transition from the FBI to another Federal agency in this context.

The probability of a major chemical/biological (C/B) incident occurring in the United States is difficult to quantify. However, the inevitability of a significant C/B incident is heightened by a number of factors including:

1) Chemical/Biological agents are relatively inexpensive to produce.

2 Basic chemical precursors and biological production processes are relatively easy to acquire.

3) The basic knowledge required to manufacture such substances is readily available.

4) The impact to the public is intensified by the inability to quickly identify and/or contain the affects of such substances (particularly biological agents).

5) Media coverage has increased the visibility and public knowledge of the use of chemical/biological weapons, thus creating a more likely scenario for their use.

6) The portability of small amounts of C/B agents,(especially biological agents), make them especially useful for clandestine purposes.

7) The proliferation of C/B agent technology and development efforts worldwide have increased the stockpile of such weapons, thus elevating the potential for the acquisition or theft of the C/B weapons by terrorist groups.

The public safety community must be prepared to address a chemical/biological event with regard to the evacuation, containment, neutralization, removal, cleanup and disposal. Some possible scenarios may include:

1) The sabotage of a hazardous chemical production or storage facility.

2) The hijacking or premeditated destruction of a tractor-trailer or railroad tanker containing hazardous materials.

3) Discovering an individual or a group of individuals involved in the manufacturing or possession of a chemical/biological weapon.

4) The dispersal of a chemical/biological agent among the civilian population, livestock or agricultural industry.

5) The contamination of a municipal water or public food supply with a chemical/biological agent.

6) The credible threat to accomplish one of the above.

GRADUATED RESPONSE:

In order to be effective, and for law enforcement to react safely to a chemical/biological agent incident, a graduated response is appropriate. Since the first priority is public safety and the preservation of life, this graduated response by knowledgeable public safety personnel would consist of the following:

1) Assessment of the incident by trained responders in specialized clothing and breathing apparatus.

2) Emergency deployment of technical personnel and resources to the incident site.

3) Response and establishment of known management resources to a command post area near the incident site.

JURISDICTIONAL RESPONSIBILITIES:

As each Chemical/Biological incident will have its own specific identity, the precedence of law enforcement responsibilities may be displaced by significant health and safety issues. At such a time, the lead role will be transferred to another agency with consequence management responsibility for the incident.

Within the United States, the Federal Bureau of Investigation (FBI) has been assigned the lead law enforcement role in responding to acts of Chemical/Biological (C/B) terrorism or other criminal-related C/B incidents in which the FBI maintains jurisdiction. The FBI derives its fundamental legal jurisdiction to deter, investigate, direct, organize and prepare for a C/B incident from an assortment of Federal statutes and executive branch directives. Some of these include the following:

1) Title 18, USC, Section 1365 - Tampering with Consumer Products;

2) Title 18, USC, Sections 871-879 - Extortion and Threats;

3) Title 18, USC, Sections 371-373 - Conspiracy;

4) Title 18, USC, Sections 175-178 - Biological Weapons Anti-Terrorism Act (BWAT);

5) Title 18, USC, Section 2332a - Weapons of Mass Destruction.

Pursuant to this jurisdictional responsibility, the FBI will respond to all C/B incidents by marshaling specialized FBI and other Federal resources to support the Special Agent-in-Charge (SAC) when faced with a potential C/B incident. Recent legislation has made the use, attempt to use or conspiracy to use a weapon of mass destruction a Federal offense.

In addition, in 1990, the BWAT Act of 1989, was signed into law. This statute makes it illegal to manufacture or possess biological agents for use as a weapon or to assist a foreign country in the development of such a weapon. It also contains extraterritorial provisions, as well as the ability to seize and destroy biological weapons.

C/B RESPONSE PROTOCOL

In a major release of a C/B agent with or without warning, the Federal Bureau of Investigation (FBI) will assume the lead role in crisis management in the interest of public safety. The FBI will continue to fulfill its law enforcement role as the situation dictates. However, these efforts will be secondary to, and in support of, the consequence management agency designated to coordinate Federal efforts in support of state and local public entities.

Activation of a C/B Threat Assessment Plan, should begin by taking the following steps:

1) Make contact with the FBI FIELD OFFICE C/B Coordinator who will immediately contact FBI Headquarters in Washington, DC

2) The FBI C/B Coordinator in Washington, DC will contact the appropriate FBIHQ Units having responsibility in a number of areas to include tactical, hostage negotiation, criminal investigative analysis, aviation support, Bomb Technicians, FBI Laboratory and other specialized resources within the FBI.

3) The FBI C/B Coordinator in Washington, DC will contact other Federal agencies having C/B support capabilities and include some of the following:

    A) Department of Defense, C/B Defense Agency;

    B) Department of Defense, U.S. Army Technical Escort;

    C) Health and Human Services, U.S. Public Health service;

    D) Environmental Protection Agency;

    E) Department of Agriculture, Emergency Programs;

    F) Federal Emergency Management Agency;

    G) Secretary of Defense;

    H) Health and Human Services, Center for Disease Control;

    I) Health and Human Services, Food and Drug Administration.

POSSIBLE INCIDENT SCENARIOS

1) A verbal or written threat only;

2) The confirmed presence of a C/B weapon, (without dissemination of the agent);

3) The release of a C/B agent, resulting in limited death or injury, requiring limited consequence management;

4) The release of a C/B agent (with or without prior warning), resulting in substantial injury or death, and requiring significant consequence management efforts.

FBI COMMAND POST STRUCTURE
(The Joint Operations Center Concept)

The SAC in charge of the FBI's response to a C/B incident will establish an on scene FBI command post designed to effectively coordinate and direct FBI actions and the actions of other agencies in response to the crisis. As the lead Federal agency, it is the FBI's responsibility to recognize, understand and coordinate other federal agencies that have a duty to respond to a C/B incident. The standard FBI command post will be modified and function as a Joint Operations Center (JOC) under the direction of the SAC.

The JOC will be structured to include both Federal and state agencies and to enhance interagency cooperation. This command post concept has been designed to reflect the FBI's responsibility and authority as the lead Federal agency during a terrorist or criminal-related C/B incident and to facilitate the FBI management of such a complex interagency operation.

The JOC will be composed of four main groups: Command, Operations, Consequence Management and Support. Some of these groups will contain other components to assist that group in fulfilling its responsibilities. The group and components are described as follows:

COMMAND GROUP: This group will be comprised of senior officials of the FBI, DOD, USPHS, FEMA and other Federal, state and local agencies as selected by the FBI, to provide the SAC with a means to quickly coordinate and reach-decisions on interagency matters that affect the resolution of the incident. Representation of agencies at Command Group briefings and meetings will be determined by the FBI SAC.

In addition, the SAC will designate a single individual to act as the point of contact (POC) between the Command Group (CG) and the FBIHQ Strategic Intelligence Operations Center (SIOC). All incoming and outgoing requests for information must go through the POC. The POC is responsible for keeping the CG and the FBIHQ/SIOC apprised of the status of the incident. Any communication occurring outside this channel should be immediately reported to the POC in order for them to keep FBIHQ/SIOC and the CG advised.

OPERATIONS GROUP: Depending on the crisis, some or all of these Command Group components within the FBI or appropriate Federal, state or local public safety entity may be staffed and used to resolve the C/B crisis:

1) Intelligence Component: Collects, processes analyzes and disseminates current and valid intelligence data. Provides situational briefings to the individuals/groups designated by the Command Group.

2) Investigative Component: Initiates and perpetuates the investigative activity. Documents crisis response and develops, assigns and ensures completion of investigative leads.

3) Tactical Component: Directs and coordinates all tactical personnel at the crisis site. Makes recommendations and provides situational briefs to the Command Group.

4) Technical Component: Directs and coordinates all technical personnel at the crisis site. Makes recommendations and provides situational briefs to the Command Group.

5) Surveillance Component: Directs and coordinates both ground and air surveillance units. Determines feasible options, makes recommendations, and provides situational briefs to the Command Group.

6) Negotiations Component: Directs and coordinates all negotiations personnel at the crisis site. Develops appropriate negotiation options and makes recommendations to the Command Group.

CONSEQUENCE MANAGEMENT GROUP: Established by, and under the direction of the FBI to manage the additional Federal, state, and local assets that will respond to any incident that has the potential for generating mass casualties or destruction.

SUPPORT GROUP: This group will be established by and under the direction of the FBI. This group will contain representatives of organizations whose primary task is to support crisis organizations represented in the operations Group and will be asked for personnel to staff various support components. Some of these support components include: Logistics, Legal, Media, Administrative and Liaison.

DEFINITIONS

One of the fundamental obstacles associated with the control and regulation of C/B weapons and agents is the difficulty in defining what constitutes such a weapon or agent. Due to the extensive civil uses of raw materials employed in the production of these weapons, a practical definition of what constitutes a weapon is crucial to enforcement efforts. The central factor in such a definition is the issue of intent.

Additionally, to be utilized effectively as a weapon, C/B agents must be delivered to the target. This requires some type of delivery system, usually designed to minimize contact and exposure to the perpetrator(s). Such a delivery system may include a vector, which is a living organism capable of transferring a biological agent to a victim (such as mosquitoes, rats, etc.); an aerosol dispersal device; or an explosive charge designed to vaporize the substance.

The following definitions have been adopted to describe the basic nature of C/B agents:

CHEMICAL WEAPONS

Chemical weapons are defined as compounds which through their chemical properties produce lethal or damaging effects in man, animal, plants or materials. They exist as solids, liquids or gas and are classified by their effects: nerve, blood, choking or blister agents.

<u>Chemical agents</u> are also generally divided into three broad classifications, sometimes referred to as lethal agents, incapacitating agents and harassing agents. Lethal agents are designed to kill or severely injure. Incapacitating agents are designed to disable the victim for at least several hours. These substances include those previously mentioned: nerve, blood, choking and blister agents. Harassing agents, which include police riot agents, are designed to force people to retreat. Depending on the circumstances and conditions, even harassing agents can result in serious medical complications.

<u>Nerve agents,</u> according to the World Health Organization, such as Tabun, Sarin or VX, may be absorbed through the skin or respiratory tract. Exposure to nerve agents causes a disruption of nerve impulse transmissions and in sufficient quantities may cause almost instant death. Therefore, full protective clothing and a protective breathing mask are required to ensure safety. The substances are stored as liquids and are usually disseminated as aerosols by means of an explosive charge. They also may be circulated by aerosol dispensers.

Blood agents, such as hydrogen cyanide and cyanogen chloride, are generally colorless liquids widely used in commercial chemical manufacturing. Their danger lies in the fact that they interfere with cell respiration. These agents attack the body through the respiratory system and if inhaled in sufficient quantities act almost immediately. Cardiac arrest can occur almost instantly.

Even though blood agents are fast acting, they dissipate quickly, and therefore are not as effective as nerve agents, particularly in a battlefield environment. A protective mask will provide short term protection. However, these agents tend to saturate charcoal filters faster than most chemical warfare agents. They are disseminated by aerosol sprayer or vaporized by explosive charge.

Choking agents cause damage to the tissues of the respiratory system and the eyes. In sufficient amounts, secondary infections can take place and in higher concentrations death occurs. A protective mask is sufficient to provide protection, provided that the atmosphere contains sufficient oxygen to support life.

Blister agents are tissue irritants. The most common blister agent is mustard gas. This substance is a liquid with the consistency of motor oil. Significant exposure will result in death between the second day and the fourth week. In lesser amounts, exposure to blister agents causes symptoms similar to severe burns and may result in secondary infections. Although generally not lethal unless exposure is significant, inhalation or contact with the eyes results in immediate searing pain. Therefore, full protective clothing and a protective breathing mask are required to ensure safety.

The lethality of chemical warfare agents is dependent on the concentration of the agent and on the method of induction into the body.

BIOLOGICAL WEAPONS

Biological agents are generally divided into either replicating (infectious) agents, or non-replicating (noninfecting or intoxicating) agents. Replicating agents are pathogenic bacteria, viruses or fungus. Non-replicating agents are produced from replicating agents, other living organisms and plants and are called "toxins".

Biological Weapons are regarded as infectious agents or toxins which are pathogenic to man. These may include numerous naturally occurring viruses, bacteria or fungi previously known to science as well as genetically engineered organisms previously unknown to man. These substances possess the common ability to kill or incapacitate large numbers of people. Biological weapons are defined as any micro-organism, virus, infectious substance or toxin, capable of causing death, disease or other biological malfunction in a human, animal, plant or other living organism. Toxins are a poisonous substance produced by a living organism, but in some cases can also be man-made.

The danger of biological weapons is amplified by the fact that exposure to the agents would probably not be diagnosed until symptoms appeared. Comprehensive quick field detection and identification methods do not currently exist for these agents. Not only may an accurate diagnosis be difficult to quickly accomplish, but the value of medical treatment for some agents may be diminished once symptoms have developed. Personal protection generally consists of immunization or the application of some other post-incident medical treatment, such as the use of antibiotics. A chemical protective mask also protects personnel from biological agents.

Viruses primarily cause diseases in man. Transmission of these viruses in a weapon system would most likely be accomplished by aerosol dissemination, or the use of a vector (a living organism capable of delivering a biological weapon to a victim, such as fever, headache, nausea and vomiting, following an incubation period of a matter of days) . These illnesses can be fatal if untreated.

Bacterial agents can be produced in the laboratory or purchased from a number of medical research firms. Dissemination would probably be accomplished by aerosol or natural dispersal such as food contamination. Infections are introduced through the respiratory tract. An incubation period may last from one day to several weeks and the fatality rate for untreated cases may exceed 80 percent. Water supplies are particularly susceptible to contamination by strains of certain bacteria. It is important to note, however, that it is extremely difficult to contaminate most municipal waste systems. The number of purification and filtering procedures and treatments built into municipal water systems would rid the water of any contamination. Private water supplies or water supplies that are not subjected to a rigorous purification process are at risk.

Fungal infections usually are induced through the respiratory system by breathing infected spores. Fungal infections can be spread through the civilian or agricultural population, and would be extremely difficult to detect prior to the first casualty. At this time, there are no known applications of fungal infections which would lend themselves to being used as a biological agent for a weapon.

Toxins are defined as poisonous substances made by living organisms, and can cause incapacitation or death quickly. Toxins can now be reproduced through new advances in biotechnology and pose a new problem for new generations of C/B weapons.

APPENDIX F

SELECTED MATERIAL SAFETY DATA SHEETS

MATERIAL SAFETY DATA SHEET

LETHAL NERVE AGENT (GA)

SECTION I - GENERAL INFORMATION

DATE: 14 September 1988
REVISED: 28 February 1996
MANUFACTURER'S ADDRESS:
U.S. ARMY CHEMICAL BIOLOGICAL DEFENSE COMMAND (CBDCOM)
EDGEWOOD RESEARCH DEVELOPMENT, AND ENGINEERING CENTER (ERDEC)
ATTN: SCBRD-ODR-S
ABERDEEN PROVING GROUND, MD 20101-5423

Emergency telephone #' s: 0700-1630 EST: 410-671-4411/4414
After: 1630 EST: 410- 278-5201, Ask for Staff Duty Officer

CAS REGISTRY NUMBER: 77-81-6

CHEMICAL NAME:

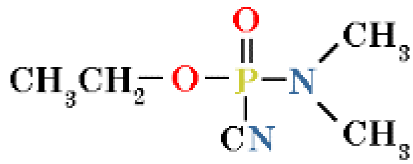
- Ethyl N,N-dimethylphosphoramidocyanidate

TRADE NAME AND SYNONYMS:

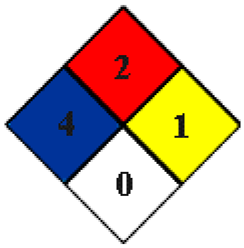
- Ethyl dimethylphosphoramidocyanidate
- Dimethylaminoethoxy-cyanophosphine oxide
- Dimethylamidoethoxyphosphoryl cyanide
- Ethyldimethylaminocyanophosphonate
- Ethyl ester of dimethylphosphoroamidocyanidic acid
- Ethylphosphorodimethylamidocyanidate
- GA
- EA1205
- Tabun

CHEMICAL FAMILY: Organophosphorus compound

FORMULA/CHEMICAL STRUCTURE:
C5 H11 N2 O2 P



NFPA 704 SIGNAL:



Health - 4
Flammability - 2
Reactivity - 1
Special - 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENTS NAME	FORMULA	PERCENTAGE BY WEIGHT	AIRBORNE EXPOSURE LIMIT (AEL)
GA	C5H11N2O2P	100	0.0001 mg/m3

SECTION III - PHYSICAL DATA

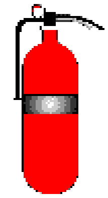
BOILING POINT DEG: 220ø C to 246ø C @ 760 mm Hg
VAPOR PRESSURE (mm Hg): 0.037 @ 20 C
VAPOR DENSITY (AIR=1): 5.63
SOLUBILITY: Slightly soluble in water: (g/100 g): 9.8 @ 25 C; 7.2 @ 20 C. Readily soluble in organic solvents.
SPECIFIC GRAVITY (H2O=1): Not available
FREEZING/MELTING POINT: -50 C
LIQUID DENSITY (g/cc): 1.073 @ 25 C
VISCOSITY (CENTISTOKE): 2.18 @ 25 C
VOLATILITY: 610 mg/m3 @ 25 C
APPEARANCE & ODOR: Colorless to brown liquid, faintly fruity odor. No odor when pure.

SECTION IV - FIRE AND EXPLOSION DATA

FLASHPOINT: 78 C

FLAMMABILITY LIMITS (% by volume): Not available

EXTINGUISHING MEDIA: Water, fog, foam, CO_2. Avoid using extinguishing methods that will cause splashing or spreading of the GA.



SPECIAL FIRE FIGHTING PROCEDURES: All persons not engaged in extinguishing the fire should be immediately evacuated from the area. Fires involving GA should be contained to prevent contamination to uncontrolled areas. When responding to a fire alarm in buildings or areas containing agents, firefighting personnel should wear full firefighter protective clothing (without TAP clothing) during chemical agent firefighting and fire rescue operations. Respiratory protection is required. Positive pressure, full face piece, NIOSH-approved self-contained breathing apparatus (SCBA) will be worn where there is danger of oxygen deficiency and when directed by the fire chief or chemical accident/incident (CAI) operations officer. In cases where firefighters are responding to a chemical accident/incident for rescue/ reconnaissance purposes, they will wear appropriate levels of protective clothing (See Section VIII).

Do not breathe fumes. Skin contact with nerve agents must be avoided at all times. Although the fire may destroy most of the agent, care must still be taken to assure the agent or contaminated liquids do not further contaminate other areas or sewers. Contact with the agent liquid or vapor can be fatal.

UNUSUAL FIRE & EXPLOSION HAZARDS: Fires involving this chemical may result in the formation of hydrogen cyanide, HCN.

SECTION V - HEALTH HAZARD DATA

AIRBORNE EXPOSURE LIMITS (AEL): The permissible airborne exposure concentration for GA for an 8-hour workday or a 40-hour work week is an 8-hour time weighted average (TWA) of 0.0001 mg/m3. This value is listed in "AR 40-8, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX." To date, the Occupational Safety and Health Administration (OSHA) has not promulgated a permissible exposure concentration for GA.
GA is not listed by the International Agency for Research on Cancer (IARC), American Conference of Governmental Industrial Hygienists (ACGIH), Occupational Safety and Health Administration (OSHA), or National Toxicology Program (NTP) as a carcinogen.

EFFECTS OF OVEREXPOSURE: GA is a lethal cholinesterase inhibitor similar in action to GB. Although only about half as toxic as GB by inhalation, GA in low concentrations is more irritating to the eyes than GB. The number and severity of symptoms that appear are dependent on the quantity and rate of entry of the nerve agent introduced into the body. (Very small skin dosages sometimes cause local sweating and tremors with few other effects.) Individuals poisoned by GA display approximately the same sequence of symptoms' despite the route by which the poison enters the body (whether by inhalation, absorption, or ingestion). These symptoms, in normal order of appearance, are: a runny nose; tightness of the chest; dimness of vision and pin pointing of the eye pupils; difficulty in breathing; drooling and excessive sweating; nausea; vomiting, cramps, and involuntary defecation and urination; twitching, jerking, and staggering; and headache, confusion, drowsiness, coma, and convulsion. These symptoms are followed by cessation of breathing and death.

Onset Time of Symptoms: Symptoms appear much more slowly from a skin dosage than from a respiratory dosage. Although skin absorption great enough to cause death may occur in 1 to 2 minutes, death may be delayed for 1 to 2 hours. Respiratory lethal dosages kill in 1 to 10 minutes, and liquid in the eye kills almost as rapidly.

Median Lethal Dosage, Animals:

LD50 (monkey, percutaneous) = 9.3 mg/kg (shaved skin)

LCt50 (monkey, inhalation) = 187 mg-min/m3 (t = 10)

Median Lethal Dosage, Man:

LCt50 (man, inhalation) = 135 mg-min/m3 (t = 0.5-2 min) at RMV of 15 l/min;
200 mg-min/m3 at RMV of 10 l/min

*Respiratory Minute Volume

EMERGENCY AND FIRST AID PROCEDURES:

FIRST AID

INHALATION: Hold breath until respiratory protective mask is donned. If severe signs of agent exposure appear (chest tightens, pupil constriction, loss of coordination, etc.), immediately administer, in rapid succession, all three Nerve Agent Antidote Kit(s), Mark I injectors (or atropine if directed by physician). Injections using the Mark I kit injectors may be repeated at 5 to 20 minute intervals if signs and symptoms are progressing until three series of injections have been administered. No more injections will be given unless directed by medical personnel. In addition, a record will be maintained of all injections given. If breathing has stopped, give artificial respiration. Mouth-to-mouth resuscitation should be used when approved mask-bag or oxygen delivery systems are not available. Do not use mouth-to-mouth resuscitation when facial contamination exists. If breathing is difficult, administer oxygen. Seek medical attention IMMEDIATELY.

EYE CONTACT: IMMEDIATELY flush eyes with water for at least 15 minutes then don respiratory protective mask. Although miosis (pinpointing of the pupils) may be an early sign of agent exposure, an injection will not be administered when miosis is the only sign present. Instead, the individual will be taken IMMEDIATELY to a medical treatment facility for observation.

SKIN CONTACT: Don respiratory protective mask and remove contaminated clothing. Immediately wash contaminated skin with copious amounts of soap and water, 10% sodium carbonate solution, or 5% liquid household bleach. Rinse well with water to remove decontaminate. Administer an intramuscular injection with the MARK I kit injectors only if local sweating and muscular twitching symptoms are observed. Seek medical attention IMMEDIATELY.

INGESTION: Do not induce vomiting. First symptoms are likely to be gastrointestinal. IMMEDIATELY administer Nerve Agent Antidote Kit(s), MARK I injectors. Seek medical attention IMMEDIATELY.

SECTION VI - REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY: Not available

HAZARDOUS DECOMPOSITION: Decomposes within six months at 60 C. Complete decomposition in 3-1/4 hours at 150 C. May produce hydrogen cyanide (HCN). Oxides of nitrogen, oxides of phosphorus, carbon monoxide, and HCN.

HAZARDOUS POLYMERIZATION: Not available

SECTION VII - SPILL, LEAK, AND DISPOSAL PROCEDURES

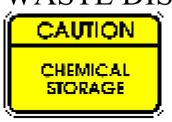
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: If leaks or spills occur, only personnel in full protective clothing will remain in the area (See Section VIII). In case of personnel contamination see Section V for emergency and first aid instructions.

RECOMMENDED FIELD PROCEDURES: Spills must be contained by covering with vermiculite, diatomaceous earth, clay, fine sand, sponges, and paper or cloth towels. This containment is followed by treatment with copious amounts of aqueous sodium hydroxide solution (a minimum 10 wt.%). Scoop up all material and clothing and place in a DOT approved container. The decontamination solution must be treated with excess bleach to destroy the HCN formed during the hydrolysis. Cover the contents with additional bleach . After sealing, the exterior of the container will be decontaminated and labeled according to EPA and DOT regulations. All leaking containers will be over packed with vermiculite placed between the interior and exterior containers. Decontaminate and label according to EPA and DOT regulations. Dispose of the material according to waste disposal methods provided below. Dispose of decontaminate according to Federal, State, and local laws. Conduct general area monitoring with an approved monitor to confirm that the atmospheric concentrations do not exceed the airborne exposure limits (See Sections II and VIII).

If 10 wt.% sodium hydroxide is not available then the following decontaminants may be used instead and are listed in order of preference: Decontaminating Agent, D2 (DS2), Sodium Carbonate and Supertropical Bleach Slurry (STB).

RECOMMENDED LABORATORY PROCEDURES: A minimum of 56 grams of decon solution is required for each gram of GA. The decontamination solution is agitated while GA is added and the agitation is maintained for at least one hour. The resulting solution is allowed to react for 24 hours. At the end of 24 hours, the solution must be titrated to a pH between 10 and 12. After completion of the 24-hour period, the decontamination solution must be treated with excess bleach (2.5 mole OCl/mole GA) to destroy the CN formed during the hydrolysis. Scoop up all material and clothing and place in a DOT container. Cover the contents with additional bleach. After sealing, the exterior of the container will be decontaminated and labeled according to state, EPA and DOT regulations. All leaking containers will be over packed with vermiculite placed between the interior and exterior containers. Decontaminate and label according to State, EPA and DOT regulations. Conduct general area monitoring with an approved monitor to confirm that the atmospheric concentrations do not exceed the airborne exposure limits (See Sections II and VIII).
Note: GA may react to form cyanogen chloride (CK) in bleach slurry.

WASTE DISPOSAL METHOD:



Open pit burning or burying of GA or items containing or contaminated with GA in any quantity is prohibited. The detoxified GA (using procedures above) can be thermally destroyed by incineration in EPA approved incinerators in accordance with appropriate provisions of Federal, State and local Resource Conservation Recovery Act (RCRA) regulations.

NOTE: Some states define decomtaminated surety material as an RCRA hazardous waste.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

CONCENTRATION	RESPIRATORY PROTECTIVE EQUIPMENT
< 0.0001 mg/m3	A full face piece, chemical canister, air-purifying protective mask will be on hand for escape. (The M9-, M17-, or M40-series masks are acceptable for this purpose. Other masks certified as equivalent may be used).
>0.0001 or = 0.2 mg/m3	A NIOSH/MSHA approved pressure demand full face piece SCBA or supplied air respirators with escape air cylinder may be used. Alternatively, a full face piece, chemical canister air-purifying protective mask is acceptable for this purpose (See DA PAM 385-61for determination of appropriate level)
>0.2 mg/m3 or unknown	NIOSH/MSHA approved pressure demand full f ace piece SCBA suitable for use in high agent concentrations with protective ensemble (See DA PAM 385-61 for examples).

VENTILATION:

Local Exhaust: Mandatory. Must be filtered or scrubbed. Air emissions must meet local, state and federal regulations.

Special: Chemical laboratory hoods will have an average inward face velocity of 100 linear feet per minute +/- 10% with the velocity at any point not deviating from the average face velocity by more than 20%. Existing laboratory hoods will have an inward face velocity of 150 lfpm +/- 20%. Laboratory hoods will be located such that cross drafts do not exceed 20% of the inward face velocity. A visual performance test using smoke producing devices will be performed in the assessment of the hoods ability to contain agent GA.

Other: Recirculation of exhaust air from agent areas is prohibited. Do not connect agent areas and other areas through the ventilation system . Emergency backup power is necessary. Hoods should be tested at least semiannually or after modification or maintenance operations. Operations should be performed 20 centimeters inside hood face.

PROTECTIVE GLOVES: Butyl Rubber Glove M3 and M4 Norton, Chemical Protective Glove Set

EYE PROTECTION: As a minimum chemical goggles will be worn. For splash hazards use goggles and face shield.

OTHER PROTECTIVE EQUIPMENT: For general lab work, gloves and lab coat will be worn with mask readily accessible. In addition, daily clean smocks, foot covers, and head covers will be required when handling contaminated lab animals.

MONITORING: Available monitoring equipment for agent GA is the Automatic Chemical Agent Detector Alarm (ACADA), bubblers (GC method), Miniature Chemical Agent Monitor (MINICAM), Chemical Agent Monitor (CAM) and Real Time Analytical Platform (RTAP).

Real-time, low-level monitors (with alarm) are required for GA operations. In their absence, an Immediately Dangerous to Life and Health (IDLH) atmosphere must be presumed. Laboratory operations conducted in appropriately maintained and alarmed engineering controls require only periodic low-level monitoring.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: In handling agents, the buddy system will be incorporated. No smoking, eating and drinking in areas containing agents is permitted. Containers should be periodically inspected for leaks (either visually or by a detector kit). Stringent control over all personnel practices must be exercised. Decontamination equipment will be conveniently placed. Exits must be designed to permit rapid evacuation. Chemical showers, eyewash stations, and personal cleanliness facilities must be provided. Wash hands before meals and each worker will shower thoroughly with special attention given to hair, face, neck, and hands, using plenty of soap and water before leaving at the end of the workday.

OTHER PRECAUTIONS: Agents must be double contained in liquid and vapor tight containers when in storage or outside a ventilation hood.

For additional information see "AR. 385-61, The Army Toxic Chemical Agent Safety Program," "DA PAM 385-61, Toxic Chemical Agent Safety Standards," and "AR. 40-8, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX."

SECTION X - TRANSPORTATION DATA

PROPER SHIPPING NAME: Poisonous liquids, n.o.s.

DOT HAZARD CLASSIFICATION: 6.1, Packing Group I, Hazard Zone B

DOT LABEL: Poison

DOT MARKING: Poisonous liquids, n.o.s. (Ethyl dimethylphosphoramidocyanidate) UN 2810, Inhalation Hazard

DOT PLACARD: Poison

EMERGENCY ACCIDENT PRECAUTIONS AND PROCEDURES: See Sections IV, VII, and VIII.

PRECAUTIONS TO BE TAKEN IN TRANSPORTATION: Motor vehicles will be placarded regardless of quantity. Drivers will be given full information regarding shipment and conditions in case of an emergency. AR 50-6 deals specifically with the shipment of chemical agents. Shipments of agent will be escorted in accordance with AR 740-32.

While the Edgewood Research Development, and Engineering Center, Department of the Army believes that the data contained herein are factual and the opinions expressed are those of the experts regarding the results of the tests conducted, the data are not to be taken as a warranty or representation for which the Department of the Army or Edgewood Research Development, and Engineering Center assume legal responsibility. They are offered solely for your consideration, investigation, and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State, and local laws and regulations.

MATERIAL SAFETY DATA SHEET

AGENT T

SECTION I - GENERAL INFORMATION

DATE: 16 April 1988
REVISED: 11 Dec 1996
MANUFACTURER'S ADDRESS:

U.S. ARMY CHEMICAL BIOLOGICAL DEFENSE COMMAND
EDGEWOOD RESEARCH DEVELOPMENT, AND ENGINEERING CENTER (ERDEC)
ATTN: SCBRD-ODR-S
ABERDEEN PROVING GROUND, MD 20101-5423

Emergency telephone #' s: 0700-1630 EST: 410-671-4411/4414
After: 1630 EST: 410- 278-5201, Ask for Staff Duty Officer

CAS REGISTRY NUMBER: 693-07-2

CHEMICAL NAME:

- Bis-(2-(2-chloroethylthio)ethyl) ether

ALTERNATE CHEMICAL NAMES:

- Di (2- (2-chloroethylthio))ethyl ether
  Di (2- (B-chloroethyl thio))ethyl ether

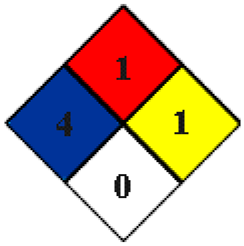
TRADE NAME AND SYNONYMS:

- T
- Sulfur Mustard (Vesicant)

CHEMICAL FAMILY: Chlorinated Sulfur Compound
FORMULA/CHEMICAL STRUCTURE:
C8H16Cl2OS2

$$(ClCH_2CH_2SCH_2CH_2)_2O$$

NFPA 704 HAZARD SIGNAL:



Health - 4
Flammability - 1
Reactivity - 1
Special - 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENTS NAME	FORMULA	PERCENTAGE BY WEIGHT	AIRBORN EXPOSURE LIMIT (AEL)
T	C8H16Cl2OS2	100	None Established

SECTION III - PHYSICAL DATA

BOILING POINT:
- 120 C @ 0.02 torr
- 174 C @ 2.0 torr

VAPOR PRESSURE (torr): 2.9 x E-5 @ 25 C (Calculated)

VAPOR DENSITY (AIR=1): 9.08 (Calculated)

SOLUBILITY IN WATER: Practically insoluble.

SPECIFIC GRAVITY (H2O=1): 1.2361 @ 25 C

FREEZING (MELTING) POINT: 9.6 - 9.9 C

VOLATILITY (mg/liter): 4.1 x E-4 @ 25 C (Calculated)

VISCOSITY (CENTISTOKE): 14.7 @ 25 C

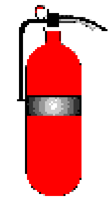
EVAPORATION RATE: Very slow.

APPEARANCE AND ODOR: Yellow liquid with a garlic-like odor, similar to Mustard Agent.

SECTION IV - FIRE AND EXPLOSION DATA

FLASHPOINT (Method Used): Unknown

FLAMMABILITY LIMITS: Unknown



EXTINGUISHING MEDIA: Water, fog, foam, CO2. Avoid use of extinguishing methods that will cause splashing or spreading of T.

SPECIAL FIRE FIGHTING PROCEDURES: All persons not engaged in extinguishing the fire should be evacuated immediately. Fires involving T should

be contained to prevent contamination of uncontrolled areas. When responding to a fire alarm in buildings or areas containing agents, firefighting personnel should wear full firefighters protective clothing (Not TAP Clothing) during chemical agent firefighting and fire rescue operations. Respiratory protection is required. Positive pressure, full face piece, NIOSH approved self-contained breathing apparatus (SCBA) will be worn where there is danger of oxygen deficiency and when directed by the fire chief or chemical accident/incident (CAI)operations officer. In cases where firefighters are responding to a chemical accident/incident for rescue/reconnaissance purposes, they will wear appropriate levels of protective clothing (See Section VIII).

Do not breathe fumes. Skin contact with agents must be avoided always. Although the fire may destroy most of the agent, care must still be taken to assure the agent or contaminated liquids do not further contaminate other areas or sewers. Contact with the agent liquid or vapor can be fatal.

SECTION V - HEALTH HAZARD DATA

AIRBORNE EXPOSURE LIMITS (AEL): No detailed health hazard data on T is available. The following information is based upon the limited available information and the chemical similarity to Mustard (HD) Agent. Under no circumstances should any individual be intentionally exposed to any direct skin or eye contact.

T presently is not listed by the International Agency for Research on Cancer (IARC), National Toxicology Program (NTP), Occupational Safety and Health Administration (OSHA), or American Conference of Governmental Hygienist as a carcinogen. However, agent T should be treated as a suspect carcinogen due to its similarity to Mustard Agent (HD).

EFFECTS OF OVEREXPOSURE: T is a vesicant (blister agent) and alkylating agent producing cytotoxic action on the hematopoietic (blood forming) tissues, which are especially sensitive, much the same as for HD. The median lethal and incapacitating doses of T in man have not been established. The median lethal dosage (LCt50) of T in mice is 1650-2250 mg-min/m3, based upon a ten minute exposure time.

ACUTE PHYSIOLOGICAL ACTION OF T IS CLASSIFIED AS LOCAL AND SYSTEMIC.

ACUTE EFFECTS: T affects both the eyes and skin. Skin damage occurs after percutaneous absorption. Being lipid soluble, T can be absorbed into all organs. Skin penetration is rapid without skin irritation. Swelling (blisters) and reddening (erythema) of the skin occurs after a latency period of 4-24 hours following the exposure, depending on the degree of the exposure and individual sensitivity. The skin healing process is very slow. Tender skin, mucous membranes, and perspiration-covered skin is more sensitive to the effects of T. T's effect on the skin, however, is less than on the eyes. Severe exposure to the eyes produces severe necrotic damage and loss of eyesight. Exposure of the eyes to T vapors or aerosol produces lacrimation, photophobia, and inflammation of the cornea.

SYSTEMIC EFFECTS: Occurs primarily through inhalation and ingestion. The T vapor or aerosol is less toxic to the skin or eyes than the liquid form. When inhaled, the upper respiratory tract (nose, throat, tracheae) is inflamed after a few hours latency period, accompanied by sneezing, coughing and bronchitis, loss of appetite, diarrhea, fever, and apathy. Exposure to nearly lethal doses of T can produce injury to bone marrow, lymph nodes, and spleen as indicated by a drop in white blood cell (WBC) count and, therefore, results in increased susceptibility to local and systemic infections. Ingestion of T will produce severe stomach pains, vomiting, and bloody stools after a 15-20 minute latency period.

CHRONIC EXPOSURE: T can cause sensitization, chronic lung impairment (cough, shortness of breath, chest pain) and possibly cancer of the mouth, throat, respiratory tract and skin, and leukemia. Exposure to T may also cause birth defects.

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Hold breath until respiratory protective mask is donned. Remove from the source IMMEDIATELY. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. Mouth-to-mouth resuscitation should be used when approved mask-bag or oxygen delivery systems are not available. Do not use mouth-to-mouth resuscitation when facial contamination exists. Seek medical attention IMMEDIATELY.

EYE CONTACT: Speed in decontaminating the eyes is essential. Remove the person from the liquid source, flush the eyes immediately with water for at least 15 minutes by tilting the head to the side, pulling eyelids apart with fingers and pouring water slowly into the eyes. Do not cover eyes with bandages but, if necessary, protect eyes by means of dark or opaque goggles. Seek medical attention IMMEDIATELY.

SKIN CONTACT: Remove the victim from the source and immediately decon skin and clothes by flushing with 5% sodium hypochlorite solution or liquid household bleach within one minute. Cut and remove contaminated clothing, flush affected areas again with decon. Wash skin area with soap and water. Seek medical attention IMMEDIATELY.

INGESTION: Do not induce vomiting. Give victim milk to drink. Seek medical attention IMMEDIATELY.

SECTION VI - REACTIVITY DATA

STABILITY: Stable at ambient temperatures. Decomposition temperature is approximately 180 C. T is a persistent agent depending on pH and moisture.

INCOMPATIBILITY: Unknown

HAZARDOUS DECOMPOSITION PRODUCTS: T will hydrolyze to form HCl and di-2-(2-hydroxy ethyl thio) ethyl ether.

HAZARDOUS POLYMERIZATION: Unknown

SECTION VII - SPILL, LEAK, AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: If spills or leaks of T occur only personnel in full protective clothing (See Section VIII) will be allowed in the area. See Section V for emergency and first aid procedures.

RECOMMENDED FIELD PROCEDURES: T should be contained using vermiculite, diatomaceous earth, clay, or fine sand and neutralized as soon as possible using copious amounts of alcoholic caustic, carbonate, or Decontaminating Solution, DS2. Caution must be exercised when using these decontaminates since acetylene will be given off. Household bleach can also be used if accompanied by stirring to allow contact. Scoop up all contaminated material and place in approved DOT containers. Cover the contents with additional decontaminant. All leaking containers will be over packed with vermiculite placed between the interior and exterior containers. Decontaminate the outside of the container and label according to DOT and EPA requirements. Dispose of according to waste procedures below. Dispose of decontaminate according to Federal, state, and local laws. Conduct general area monitoring with an approved monitor to confirm that the atmospheric concentrations do not exceed the airborne exposure limit (See Sections II and VIII).

WARNING: Never use dry High Test Hypochlorite (HTH) or Super Tropical Bleach (STB) since they will react violently with T and may burst into flames.

RECOMMENDED LABORATORY PROCEDURES:
A minimum of 65 grams of decon solution per gram of T is allowed to agitate for a minimum of one hour. Agitation is not necessary following the first hour if a single phase is obtained. At the end of 24 hours, the resulting solution will be adjusted to a pH between 10 and 11. Test for presence of active chlorine by use of acidic potassium iodide

solution to give free iodine color. Place 3 ml of the decontaminate in a test tube. Add several crystals of potassium iodine and swirl to dissolve. Add 3 ml of 50 wt.% sulfuric acid: water and swirl. IMMEDIATE iodine color shows the presence of active chlorine. If negative, add additional 5.25 % sodium hypochlorite solution to the decontamination solution, wait two hours, then test again for active chlorine. Continue procedure until positive chlorine is given by solution. Scoop up all material and place in approved DOT containers. Cover the contents with additional decontaminate as above. The exterior of the container will be decontaminated and labeled according to EPA and DOT regulations. All leaking containers will be over packed with vermiculite placed between the interior and exterior containers. Decontaminate and label according to EPA and DOT regulations. Dispose of the material according to waste disposal methods provided below. Dispose of decontaminate according to Federal, state and local regulations. Conduct general area monitoring with an approved monitor to confirm that the atmospheric concentrations do not exceed the airborne exposure limits (See Sections II and VIII).

A 10 wt.% calcium hypochlorite mixture may be substituted for sodium hypochlorite. Use 65 grams of decon per gram of T and continue the test as described for sodium hypochlorite.

NOTE: Surfaces contaminated with T, then rinse-decontaminated may evolve sufficient T vapor to produce a physiological response. T on laboratory glassware may be oxidized by it vigorous reaction with concentrated nitric acid.

WASTE DISPOSAL METHOD: All neutralized material should be collected, contained and thermally decomposed in EPA approved incinerators that will filter or scrub toxic by-products from effluent air before discharge to the atmosphere. Any contaminated materials or protective clothing should be decontaminated using HTH or bleach and analyzed to assure it is free of detectable contamination (3X) level. The clothing should then be sealed in plastic bags inside properly labeled drums and held for shipment back to the DA issue point.

NOTE: Some states define decontaminated surety material as a RCRA hazardous waste.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

CONCENTRATION	RESPIRATORY PROTECTIVE EQUIPMENT
< 0.003 (mg/m3)	NIOSH approved full face piece, chemical canister air-purifying, respirators or protective masks will be on hand for escape. (M9, M17, M40 series protective masks or other certified equivalent masks are acceptable for this, use with the M3 toxicological agent protective suit for dermal protection).
>0.003 or concentration unknown	NIOSH approved pressure demand full face piece SCBA, suitable for use in unknown or high agent concentrations, with a protective ensemble. (See DA Pam 385-61 for examples)

VENTILATION

Local exhaust: Mandatory. Must be filtered or scrubbed to limit exit concentration to non-detectable level. Air emissions will meet Federal, state and local laws and regulations.

Special: Chemical laboratory hoods will have an average inward face velocity of 100 linear feet per minute (1fpm) +/- 10% with the velocity at any point not deviating from the average face velocity by more than 20%. Existing laboratory hoods will have an inward face velocity of 150 lfpm +/- 20%. Laboratory hoods will be located such that cross drafts do not exceed 20% of the inward face velocity. A visual performance test utilizing smoke producing devices will be performed in the assessment of the inclosure's ability to contain T.

Other: Recirculation of exhaust air from agent areas is prohibited. No connection between agent area and other areas through the ventilation system are permitted. Emergency backup power is necessary. Hoods should be tested semiannually or after modification or maintenance operations. Operations should be performed 20 centimeters inside hoods. Procedures should be developed for disposal of contaminated filters.

PROTECTIVE GLOVES: M3 and M4 Butyl Rubber, Norton, Chemical Protective Glove Set

EYE PROTECTION: As a minimum, chemical goggles will be worn. For splash hazards use goggles and face-shield.

OTHER PROTECTIVE EQUIPMENT: For laboratory operations, wear lab coats, gloves and have a mask readily accessible. In addition, daily clean smocks, foot covers, and head covers will be required when handling contaminated lab animals.

MONITORING: Real Time Analytical Platform (RTAP)
Real-time, low-level monitors (with alarm) are required for operations. In their absence, an Immediately Dangerous to Life and Health (IDLH) atmosphere must be presumed. Laboratory operations conducted in appropriately maintained and alarmed engineering controls require only periodic low-level monitoring.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: When handling agents, the buddy system will be incorporated. No smoking, eating, or drinking in areas containing agents are permitted. Containers should be periodically inspected for leaks, either visually or using a detector kit. Stringent control over all personnel handling agents must be exercised. Decontaminating equipment will be conveniently placed. Exits must be designed to permit rapid evacuation. Chemical showers, eye wash stations, and personal cleanliness facilities must be provided. Wash hands before meals and shower thoroughly with special attention given to hair, face, neck, and hands, using plenty of soap before leaving at the end of the workday.

OTHER PRECAUTIONS: T should be stored in containers made of glass for Research, Development Test and Evaluation (RDTE) quantities or one-ton steel containers for large quantities. Agents will be double contained in vapor and liquid tight containers when in storage or during transportation.
For additional information see "AR 385-61, The Army Toxic Chemical Agent Safety Program," "DA Pam 385-61, Toxic Chemical Agent Safety Standards," and "DA Pam 40-173, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Mustard H, HD, and HT."

SECTION X - TRANSPORTATION DATA

PROPER SHIPPING NAME: Poisonous liquids, n.o.s.

DOT HAZARDS CLASSIFICATION: 6.1, Packing Group I, Zone B

DOT LABEL: Poison

DOT MARKING: Poisonous liquids, n.o.s. Bis-(2-(2-chloroethylthio)ethyl) ether UN 2810, Inhalation Hazard

DOT PLACARD: POISON

EMERGENCY ACCIDENT PRECAUTIONS & PROCEDURES: See Sections IV, VII and VIII.

PRECAUTIONS TO BE TAKEN IN TRANSPORTATION: Motor vehicles will be placarded regardless of quantity. Drivers will be given full information regarding shipment and conditions in case of an emergency. AR 50-6 deals specifically with the shipment of chemical agents. Shipment of agents will be escorted according to AR 740-32.

While the Edgewood Research Development, and Engineering Center, Department of the Army believes that the data contained herein are factual and the opinions expressed are those of the experts regarding the results of the tests conducted, the data are not to be taken as a warranty or representation for which the Department of the Army or Edgewood Research Development, and Engineering Center assumes legal responsibility. They are offered solely for your consideration, investigation, and verification. Any use of these data and information must be determined by the user according to applicable Federal, State, and local laws and regulations.

MATERIAL SAFETY DATA SHEET

LETHAL NERVE AGENT (GB)

SECTION I - GENERAL INFORMATION

DATE: 14 September 1988
REVISED: 28 February 1996

MANUFACTURER'S ADDRESS:
U.S. ARMY CHEMICAL BIOLOGICAL DEFENSE COMMAND EDGEWOOD RESEARCH DEVELOPMENT, AND ENGINEERING CENTER (ERDEC)
ATTN: SCBRD-ODR-S
ABERDEEN PROVING GROUND, MD 20101-5423

Emergency telephone #' s: 0700-1630 EST: 410-671-4411/4414
After: 1630 EST: 410- 278-5201, Ask for Staff Duty Officer

CAS REGISTRY NUMBERS: 107-44-8, 50642-23-4

CHEMICAL NAME:
- Isopropyl methylphosphonofluoridate

ALTERNATE CHEMICAL NAMES:
- O-Isopropyl Methylphosphonofluoridate
- Phosphonofluoridic acid, methyl-, isopropyl ester
- Phosphonofluoridic acid, methyl-, 1-methylethyl ester

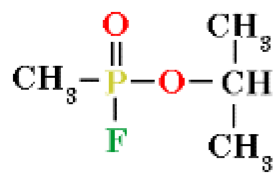
TRADE NAME AND SYNONYMS:
- Isopropyl ester of methylphosphonofluoridic acid
- Methylisopropoxfluorophosphine oxide
- Isopropyl Methylfluorophosphonate
- O-Isopropyl Methylisopropoxfluorophosphine oxide
- Methylfluorophosphonic acid, isopropyl ester
- Isopropoxymethylphosphonyl fluoride
- Isopropyl methylfluorophosphate

- Isopropoxymethylphosphoryl fluoride
- GB
- Sarin
- Zarin

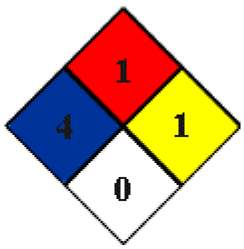
CHEMICAL FAMILY: Fluorinated organophosphorous compound

FORMULA/CHEMICAL STRUCTURE:

C4H10FO2P



NFPA 704 HAZARD SIGNAL:



Health - 4
Flammability - 1
Reactivity - 1
Special - 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENTS NAME	FORMULA	PERCENTAGE BY WEIGHT	AIRBORNE EXPOSURE LIMIT (AEL)
GB	C4H10FO2P	100	0.0001 mg/m3

SECTION III - PHYSICAL DATA

BOILING POINT: 158 C (316 F)

VAPOR PRESSURE (mm Hg): 2.9 @ 25 C

VAPOR DENSITY (AIR=1): 4.86

SOLUBILITY: Miscible with water. Soluble in all organic solvents.

SPECIFIC GRAVITY (H2O=1): 1.0887 @ 25 C

FREEZING/MELTING POINT: -56 C

LIQUID DENSITY (g/cc):
- 1.0887 @ 25 C
- 1.102 @ 20 C

PERCENTAGE VOLATILE BY VOLUME:
- 22,000 m/m3 @ 25 C
- 16,090 m/m3 @ 20 C

APPEARANCE AND ODOR: Colorless liquid. Odorless in pure form.

SECTION IV - FIRE AND EXPLOSION DATA

FLASH POINT (METHOD USED): Did not flash to 280 F

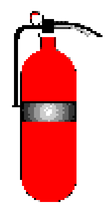
FLAMMABLE LIMIT: Not applicable

LOWER EXPLOSIVE LIMIT: Not available

UPPER EXPLOSIVE LIMIT: Not available

EXTINGUISHING MEDIA: Water mist, fog, foam, CO2.

Avoid using extinguishing methods that will cause splashing or spreading of the GB.



SPECIAL FIRE FIGHTING PROCEDURES: GB will react with steam or water to produce toxic and corrosive vapors. All persons not engaged in extinguishing the fire should be evacuated. Fires involving GB should be contained to prevent contamination to uncontrolled areas. When responding to a fire alarm in buildings or areas containing agents, firefighting personnel should wear full firefighting protective clothing (without TAP clothing) during chemical agent firefighting and fire rescue operations. Respiratory protection is required. Positive pressure, full face piece, NIOSH-approved self-contained breathing apparatus (SCBA) will be worn where there is danger of oxygen deficiency and when directed by the fire chief or chemical accident/incident (CAI) operations officer. In cases where firefighters are responding to a chemical accident/incident for rescue/reconnaissance purposes, they will wear appropriate levels of protective clothing (**See Section VIII**).

Do not breathe fumes. Skin contact with nerve agents must be avoided at all times. Although the fire may destroy most of the agent, care must still be taken to assure the agent or contaminated liquids do not further contaminate other areas or sewers. Contact with the agent liquid or vapor can be fatal.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Hydrogen may be present.

SECTION V - HEALTH HAZARD DATA

AIRBORNE EXPOSURE LIMITS (AEL): The permissible airborne exposure concentration for GB for an 8-hour workday or a 40-hour work week is an 8-hour time weighted average (TWA) of 0.0001 mg/m3. This value is based on the TWA of GB which can be found in "AR 40-8, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX." To date, the Occupational Safety and Health Administration (OSHA) has not promulgated a permissible exposure concentration for GB.

GB is not listed by the International Agency for Research on Cancer (IARC), American Conference of Governmental Industrial Hygienists (ACGIH), Occupational Safety and Health Administration (OSHA), or National Toxicology Program (NTP) as a carcinogen.

EFFECTS OF OVEREXPOSURE: GB is a lethal cholinesterase inhibitor. Doses that are potentially life threatening may be only slightly larger than those producing least effects.

GB

Route Dosage	Form	Effect	Type
ocular	vapor	ECt50	<2 mg-min/m3
inhalation	vapor	ECt50	<2 mg-min/m3
inhalation (15 1/min)	vapor	ICt50	35 mg-min/m3
inhalation	vapor	LCt50	70 mg-min/m3
percutaneous	liquid	LD50	1700 mg/70 kg man

Effective dosages for vapor are estimated for exposure durations of 2-10 minutes. Symptoms of overexposure may occur within minutes or hours, depending upon dose. They include: miosis (constriction of pupils) and visual effects, headaches and pressure sensation, runny nose and nasal congestion, salivation, tightness in the chest, nausea, vomiting, giddiness, anxiety, difficulty in thinking and sleeping, nightmares, muscle twitches, tremors, weakness, abdominal cramps, diarrhea, involuntary urination and defecation. With severe exposure symptoms progress to convulsions and respiratory failure.

EMERGENCY AND FIRST AID PROCEDURES:

FIRST AID

INHALATION: Hold breath until respiratory protective mask is donned. If severe signs of agent exposure appear (chest tightens, pupil constriction, incoordination, etc.), immediately administer, in rapid succession, all three Nerve Agent Antidote Kit(s), Mark I injectors (or atropine if directed by physician). Injections using the Mark I kit injectors may be repeated at 5 to 20 minute intervals if signs and symptoms are progressing until three series of injections have been administered. No more injections will be given unless directed by medical personnel. In addition, a record will be maintained of all injections given. If breathing has stopped, give artificial respiration. Mouth-to-mouth resuscitation should be used when approved mask-bag or oxygen delivery systems are not available. Do not use mouth-to-mouth resuscitation when facial contamination exists. If breathing is difficult, administer oxygen. Seek medical attention IMMEDIATELY.

EYE CONTACT: Immediately flush eyes with water for at least 15 minutes, then don respiratory protective mask. Although miosis (pinpointing of the pupils) may be an early sign of agent exposure, an injection will not be administered when miosis is the only sign present. Instead, the individual will be taken IMMEDIATELY to a medical treatment facility for observation.

SKIN CONTACT: Don respiratory protective mask and remove contaminated clothing. Immediately wash contaminated skin with copious amounts of soap and water, 10% sodium carbonate solution, or 5% liquid household bleach. Rinse well with water to remove decontaminant. Administer Nerve Agent Antidote Kit(s), MARK I injectors only if local sweating and muscular twitching symptoms are observed. Seek medical attention IMMEDIATELY.

INGESTION: Do not induce vomiting. First symptoms are likely to be gastrointestinal. IMMEDIATELY administer Nerve Agent Antidote Kit(s), MARK I injector(s). Seek medical attention IMMEDIATELY.

SECTION VI - REACTIVITY DATA

STABILITY: Stable when pure.

INCOMPATIBILITY: Attacks tin, magnesium, cadmium plated steel, and some aluminum. Slightly attacks copper, brass, and lead; practically no attack on 1020 steels, Inconel & K-monel.

HAZARDOUS DECOMPOSITION: Hydrolyzes to form HF under acid conditions and isopropyl alcohol & polymers under basic conditions.

HAZARDOUS POLYMERIZATION: Does not occur.

SECTION VII - SPILL, LEAK, AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: If leaks or spills occur, only personnel in full protective clothing will remain in area (**See Section**

VIII). In case of personnel contamination see **Section V** for emergency and first aid instructions.

RECOMMENDED FIELD PROCEDURES: Spills must be contained by covering with vermiculite, diatomaceous earth, clay, fine sand, sponges, and paper or cloth towels. Decontaminate with copious amounts of aqueous sodium hydroxide solution (a minimum 10 wt. %). Scoop up all material and clothing and place in a DOT approved container. Cover the contents with decontaminating solution as above. After sealing, the exterior of the container will be decontaminated and then labeled according to EPA and DOT regulations. All leaking containers will be over packed with vermiculite placed between the interior and exterior containers. Decontaminate and label according to EPA and DOT regulations. Dispose of the material according to waste disposal methods provided below. Dispose of decontaminate according to Federal, state and local regulations. Conduct general area monitoring with an approved monitor to confirm that the atmospheric concentrations do not exceed the airborne exposure limits (**See Sections II and VIII**).

If 10 wt.% aqueous sodium hydroxide solution is not available then the following decontaminants may be used instead and are listed in the order of preference: Decontaminating Agent, DS (DS2), Sodium Carbonate, and Supertropical Bleach Slurry (STB).

RECOMMENDED LABORATORY PROCEDURES: A minimum of 56 grams of decon solution is required for each gram of GB. Decontaminant and agent solution is allowed to agitate for a minimum of one hour. Agitation is not necessary following the first hour. At the end of the hour, the resulting solution should be adjusted to a pH greater than 11.5. If the pH is below 11.5, NaOH should be added until a pH above 11.5 can be maintained for 60 minutes. An alternate solution for the decontamination of GB is 10 wt.% sodium carbonate in place of the 10% sodium hydroxide solution above. Continue with 56 grams of decon for each gram of agent. Agitate for one hour but allow three hours for the reaction. The final pH should be adjusted to above zero. It is also permitted to substitute 5.25% sodium hypochlorite or 25 wt. % Monoethylamine (MEA) for the 10% sodium hydroxide solution above. MEA must be completely dissolved in water before addition of the agent. Continue with 56 grams of decon for each gram of GB and provide agitation for one hour. Continue with same ratios and time stipulations. Scoop up all material and clothing and place in a DOT approved container. Cover the contents with decontaminating solution as above. After sealing, the exterior of the container will be decontaminated and then labeled according to EPA and DOT regulations. All leaking containers will be over packed with vermiculite placed between the interior and exterior containers. Decontaminate and label according to EPA and DOT regulations. Dispose of according to waste disposal methods provided below. Dispose of decontaminate according to Federal, state and local regulations. Conduct general area monitoring with an approved monitor to confirm that the atmospheric concentrations do not exceed the airborne exposure limits (**See Sections II and VIII**).

WASTE DISPOSAL METHOD: Open pit burning or burying of GB or items containing or contaminated with GB in any quantity is prohibited. The detoxified GB (using procedures above) can be thermally destroyed by incineration in EPA approved incinerators according to appropriate provisions of Federal, state and local Resource Conservation and Recovery Act (RCRA) Regulations.

NOTE: Some states define decontaminated surety material as an RCRA Hazardous waste.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

CONCENTRATION	RESPIRATORY PROTECTIVE EQUIPMENT.
< 0.0001 mg/m3	A full face piece, chemical canister, air purifying protective mask will be on hand for escape. (The M9-, M17-, or M40-series masks are acceptable for this purpose. Other masks certified as equivalent may be used)
> 0.0001 or =0.2 mg/m3	A NIOSH/MSHA approved pressure demand full face piece SCBA or supplied air respirators with escape air cylinder may be used. Alternatively, a full face piece, chemical canister air-purifying protective mask is acceptable for this purpose (See DA PAM 385-61 for determination of appropriate level)
>0.2 or unknown mg/m3	NIOSH/MSHA approved pressure demand full f ace piece SCBA suitable for use in high agent concentrations with protective ensemble (See DA PAM 385-61 for examples)

VENTILATION:
Local Exhaust: Mandatory. Must be filtered or scrubbed to limit exit concentration to < 0.0001 mg/m3. Air emissions will meet local, state and federal regulations.

Special: Chemical laboratory hoods will have an average inward face velocity of 100 linear feet per minute (lfpm) +/- 10% with the velocity at any point not deviating from the average face velocity by more than 20%. Existing laboratory hoods will have an inward face velocity of 150 lfpm +/- 20%. Laboratory hoods will be located such that cross drafts do not exceed 20% of the inward face velocity. A visual performance test using smoke producing devices will be performed in the assessment of the hoods ability to contain agent GB.

Other: Recirculation of exhaust air from agent areas is prohibited. No connection is allowed between agent areas and other areas through the ventilation system. Emergency backup power is necessary. Hoods should be tested at least semiannually or after modification or maintenance operations. Operations should be performed 20 centimeters inside hood face.

PROTECTIVE GLOVES:

- Butyl Rubber Glove M3 and M4
- Norton, Chemical Protective Glove Set

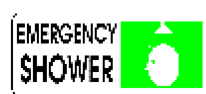
EYE PROTECTION: As a minimum chemical goggles will be worn. For splash hazards use goggles and face shield.

OTHER PROTECTIVE EQUIPMENT: For general lab work, gloves and lab coat will be worn with mask readily accessible. In addition, daily clean smocks, foot covers, and head covers will be required when handling contaminated lab animals.

MONITORING: Available monitoring equipment for agent GB is the M8/M9 Detector paper, detector ticket, blue band tube, M256/M256A1 kits, bubbler, Depot Area Air Monitoring System (DAAMS), Automatic Continuous Air Monitoring System (ACAMS), real time monitoring (RTM), Demilitarization Chemical Agent Concentrator (DCAC), M8/M43, M8A1/M43A2, Hydrogen Flame Photometric Emission Detector (HYFED), CAM-M1, Miniature Chemical Agent Monitor (MINICAM) and the Real Time Analytical Platform (RTAP).

Real-time, low-level monitors (with alarm) are required for GB operations. In their absence, an Immediately Dangerous to Life and Health (IDLH) atmosphere must be presumed. Laboratory operations conducted in appropriately maintained and alarmed engineering controls require only periodic low-level monitoring.

SECTION IX - SPECIAL PRECAUTIONS



PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: When handling agents, the buddy system will be incorporated. No smoking, eating and drinking in areas containing agents are permitted. Containers should be periodically inspected for leaks either visually or by a detector kit).

Stringent control over all personnel practices must be exercised Decontamination equipment will be conveniently located. Exits must be designed to permit rapid evacuation. Chemical showers, eyewash stations, and personal cleanliness facilities must be provided. Wash hands before meals and each worker will shower thoroughly with special attention given to hair, face, neck, and hands, using plenty of soap and water before leaving at the end of the work day.

OTHER PRECAUTIONS: GB must be double contained in liquid and vapor tight containers when in storage or outside a ventilation hood.

For additional information see "AR 385-61, The Army Toxic Chemical Agent Safety Program," "DA PAM 385-61, Toxic Chemical Agent Safety Standards," and "AR 40-8, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX."

SECTION X - TRANSPORTATION DATA

PROPER SHIPPING NAME: Poisonous liquids, n.o.s.

DOT HAZARD CLASSIFICATION: 6.1, Packing Group I,

Hazard Zone A

DOT LABEL: Poison

DOT MARKING: Poisonous liquid, n.o.s. (Isopropyl methylphosphonofluoridate) UN2810, Inhalation Hazard

DOT PLACARD: Poison

EMERGENCY ACCIDENT PRECAUTIONS AND PROCEDURES: **See Sections IV, VII and VIII.**

PRECAUTIONS TO BE TAKEN IN TRANSPORTATION: Motor vehicles will be placarded regardless of quantity. Drivers will be given full information regarding shipment and conditions in case of an emergency. AR 50-6 deals specifically with the shipment of chemical agents. Shipments of agent will be escorted in accordance with AR 740-32.

While the Edgewood Research Development, and Engineering Center, Department of the Army believes that the data contained herein are factual and the opinions expressed are those of the experts regarding the results of the tests conducted, the data are not to be taken as a warranty or representation for which the Department of the Army or Edgewood Research Development, and Engineering Center assume legal responsibility. They are offered solely for your consideration, investigation, and verification. Any use of this data and information must be determined by the user to be in accordance with applicable Federal, State, and local laws and regulations.

MATERIAL SAFETY DATA SHEET

LETHAL NERVE AGENT (GD)

SECTION I - GENERAL INFORMATION

DATE: 14 September 1988
REVISED: 28 February 1996

MANUFACTURER'S ADDRESS:
U.S. ARMY CHEMICAL BIOLOGICAL DEFENSE COMMAND
EDGEWOOD RESEARCH DEVELOPMENT, AND ENGINEERING CENTER (ERDEC)
ATTN: SCBRD-ODR-S
ABERDEEN PROVING GROUND, MD 20101-5423

Emergency telephone #' s: 0700-1630 EST: 410-671-4411/4414
After: 1630 EST: 410- 278-5201, Ask for Staff Duty Officer

CAS REGISTRY NUMBERS: 96-64-0, 50642-24-5

CHEMICAL NAME:
Pinacolyl methyl phosphonofluoridate

ALTERNATE CHEMICAL NAMES:

- Phosphonofluoridic acid, methyl-,1,2,2-trimethylpropyl ester
- O-Pinalcolyl methylphosphonofluoridate

TRADE NAME AND SYNONYMS:

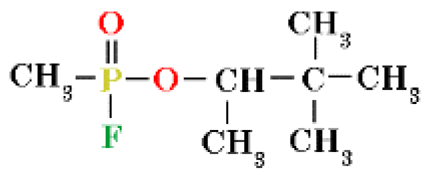
- 3,3 dimethyl-n-but-2-yl methylphosphonofluridate
- 1,2,2-Trimethylpropyl methylphosphonofluoridate
- Methylpinacolyloxyfluorophosphine oxide
- Pinacolyloxymethylphosphonyl fluoride
- Pinacolyl methanefluorophosphonate
- Methylfluoropinacolylphosphonate
- Fluoromethylpinacolyloxyphosphine oxide
- Methylpinacolyloxyphosphonyl fluoride

- Pinacolyl methylfluorophosphonate
- 1,2,2-Trimethylpropoxyfluoromethylphosphine oxide
- GD
- EA 1210
- Soman
- Zoman
- PFMP

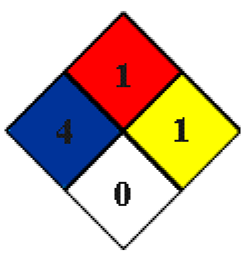
CHEMICAL FAMILY: Fluorinated organophosphorous compound

FORMULA/CHEMICAL STRUCTURE:

C7H16FO2P



NFPA 704 SIGNAL:



Health - 4
Flammability - 1
Reactivity - 1
Special - 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENTS NAME	FORMULA	PERCENTAGE BY WEIGHT	AIRBORNE EXPOSURE LIMIT (AEL)
GD	C7H16FO2P	100	0.00003 mg/m3

SECTION III - PHYSICAL DATA

BOILING POINT: 198 C (388 F)

VAPOR PRESSURE: 0.40 mm Hg @ 25 C

VAPOR DENSITY (AIR=1): 6.33

SOLUBILITY: 2.1 percent at 20 C and 3.4 percent at 0 C in water. Soluble in sulfur mustard, gasoline, alcohols, fats, and oils.

SPECIFIC GRAVITY (H_2O=1): 1.022 @ 25 C

FREEZING/MELTING POINT: -42C

LIQUID DENSITY (g/cc): 1.0222 @ 25 C

PERCENTAGE VOLATILE BY VOLUME: 3900 mg/m3 @ 25 C

APPEARANCE AND ODOR: When pure, colorless liquid with a fruity odor. With impurities, amber or dark brown with oil of camphor odor.

SECTION IV - FIRE AND EXPLOSION DATA

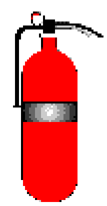
FLASHPOINT: 121 C (Open cup)

FLAMMABLE LIMIT: Unknown

LOWER EXPLOSIVE LIMIT: Not available

UPPER EXPLOSIVE LIMIT: Not available

EXTINGUISHING MEDIA: Water mist, fog, foam, CO_2. Avoid using extinguishing methods that will cause splashing or spreading of the GD.



SPECIAL FIRE FIGHTING PROCEDURES: GD will react with steam or water to produce toxic & corrosive vapors. All persons not engaged in extinguishing the fire should be evacuated. Fires involving GD should be contained to prevent contamination to uncontrolled areas. When responding to a fire alarm in buildings or areas containing agents, firefighting personnel should wear full firefighting protective clothing (without TAP clothing) during chemical agent firefighting and fire rescue operations. Respiratory protection is required. Positive pressure, full face piece, NIOSH-approved self-contained breathing apparatus (SCBA) will be worn where there is danger of oxygen deficiency and when directed by the fire chief or chemical accident/incident (CAI) operations officer. In cases where firefighters are responding to a chemical accident/incident for rescue/reconnaissance purposes, they will wear appropriate levels of protective clothing **(See Section VIII).**

Do not breathe fumes. Skin contact with nerve agents must be avoided at all times. Although the fire may destroy most of the agent, care must still be taken to assure the agent or contaminated liquids do not further contaminate other areas or sewers. Contact with the agent liquid or vapor can be fatal.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Hydrogen produced by the corrosive vapors reacting with metals, concrete, etc., may be present.

SECTION V - HEALTH HAZARD DATA

AIRBORNE EXPOSURE LIMITS (AEL): The permissible airborne exposure concentration for GD for an 8-hour workday or a 40-hour work week is an 8-hour time weighted average (TWA) of 0.00003 mg/m3. This value is based on the TWA of GD which can be found in "AR 40-8, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX." To date, the Occupational Safety and Health Administration (OSHA) has not promulgated a permissible exposure concentration for GD.

GD is not listed by the International Agency for Research on Cancer (IARC), American Conference of Governmental Industrial Hygienists (ACGIH), Occupational Safety and Health Administration (OSHA), or National Toxicology Program (NTP) as a carcinogen.

EFFECTS OF OVEREXPOSURE: GD is a lethal cholinesterase inhibitor. Doses that are potentially life threatening may be only slightly larger than those producing least effects. GD

Route	Form	Effect	Type	Dosage
ocular	vapor	miosis	ECt50	<2 mg-min/m3
inhalation	vapor	runny nose	ECt50	<2 mg-min/m3
inhalation (15 1/min)	vapor	severe incapacitation	ICt50	35 mg-min/m3
inhalation (15 1/min)	vapor	death	LCt50	70 mg-min/m3
percutaneous	liquid	death	LD50	350 mg/70 kg man

Effective dosages for vapor are estimated for exposure durations of 2-10minutes. Symptoms of overexposure may occur within minutes or hours, depending upon dose. They include: miosis (constriction of pupils) and visual effects, headaches and pressure sensation, runny nose and nasal congestion, salivation, tightness in the chest, nausea, vomiting, giddiness, anxiety, difficulty in thinking and sleeping, nightmares, muscle twitches, tremors, weakness, abdominal cramps, diarrhea, involuntary urination and defecation. With severe exposure symptoms progress to convulsions and respiratory failure.

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Hold breath until respiratory protective mask is donned. If severe signs of agent exposure appear (chest tightens, pupil constriction, incoordination, etc.), immediately administer, in rapid succession, all three Nerve Agent Antidote Kit(s), Mark I injectors (or atropine if directed by physician). Injections using the Mark I kit injectors may be repeated at 5 to 20 minute intervals if signs and symptoms are progressing until three series of injections have been administered. No more injections will be given unless directed by medical personnel. In addition, a record will be maintained of all injections given. If breathing has stopped, give artificial respiration. Mouth-to-mouth resuscitation should be used when approved mask-bag or oxygen delivery systems are not available. Do not use mouth-to-mouth resuscitation when facial contamination exists. If breathing is difficult, administer oxygen. Seek medical attention IMMEDIATELY.

EYE CONTACT: Immediately flush eyes with water for at least 15 minutes, then don respiratory protective mask. Although miosis (pinpointing of the pupils) may be an early sign of agent exposure, an injection will not be administered when miosis is the only sign present. Instead, the individual will be taken IMMEDIATELY to a medical treatment facility for observation.

SKIN CONTACT: Don respiratory protective mask and remove contaminated clothing. Immediately wash contaminated skin with copious amounts of soap and water, 10% sodium carbonate solution, or 5% liquid household bleach. Rinse well with water to remove decontaminant. Administer Nerve Agent Antidote Kit(s), MARK I injectors only if local sweating and muscular twitching symptoms are observed. Seek medical attention IMMEDIATELY.

INGESTION: Do not induce vomiting. First symptoms are likely to be gastrointestinal.

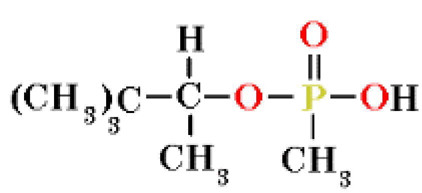
IMMEDIATELY administer Nerve Agent Antidote Kit(s), MARK I injector(s). Seek medical attention IMMEDIATELY.

SECTION VI - REACTIVITY DATA

STABILITY: Stable after storage in steel for three months at 65 C.

INCOMPATIBILITY: GD corrodes steel at the rate of 1 x 10-5 inch/month.

HAZARDOUS DECOMPOSITION: GD will hydrolyze to form HF and



HAZARDOUS POLYMERIZATION: Does not occur.

SECTION VII - SPILL, LEAK AND DISPOSAL METHODS

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: If leak or spills occur, only personnel in full protective clothing **(See Section VIII)** will remain in area. In case of personnel contamination see **Section V** for emergency and first aid instructions.

RECOMMENDED FIELD PROCEDURES: Spills must be contained by covering with vermiculite, diatomaceous earth, clay, fine sand, sponges, and paper or cloth towels. Decontaminate with copious amounts of aqueous Sodium Hydroxide solution (a minimum 10 wt.%). Scoop up all material and clothing and place in a DOT approved container. Cover the contents with decontaminating solution as above. After sealing, the exterior of the container will be decontaminated and then labeled according to EPA and DOT regulations. All leaking containers will be over packed with vermiculite placed between the interior and exterior containers. Decontaminate and label according to EPA and DOT regulations. Dispose of the material according to waste disposal methods provided below. Dispose of decontaminate according to Federal, state and local regulations. Conduct general area monitoring with an approved monitor to confirm that the atmospheric concentrations do not exceed the airborne exposure limits **(See Sections II and VIII)**.

If 10 wt.% aqueous sodium hydroxide solution is not available then the following decontaminants may be used instead and are listed in the order of preference: Decontaminating Agent, DS (DS2), Sodium Carbonate, and Supertropical Bleach Slurry (STB).

RECOMMENDED LABORATORY PROCEDURES: A minimum of 55 grams of decon solution is required per gram of GD. Decontaminant/agent solution is allowed to agitate for a minimum of one hour. Agitation is not necessary following the first hour provided a single phase is obtained. At the end of the first hour the pH should be checked and adjusted up to 11.5 with additional NaOH as required. An alternate solution for the decontamination of GD is 10% sodium carbonate in place of the 10% Sodium Hydroxide solution above. Continue with 55 grams of decon per gram of GD. Agitate for one hour and allow to react for three hours. At the end of the third hour adjust the pH to above 10. It is also permitted to substitute 5.25 % sodium hypochlorite for the 10% sodium hydroxide solution above. Continue with 55 grams of decon per gram of GD. Agitate for one hour and allow to react for three hours then adjust the pH to above 10. Scoop up all material and clothing and place in a DOT approved container. Cover the contents with decontaminating solution as above. After sealing, the exterior of the container will be decontaminated and labeled according to EPA and DOT regulations. All leaking containers will be over packed with vermiculite placed between the interior and exterior containers. Decontaminate and label according to EPA and DOT regulations. Dispose of the material according to waste disposal methods provided below. Dispose of decontaminate according to Federal, state and local regulations. Conduct general area monitoring with an approved monitor to confirm that the atmospheric concentrations do not exceed the airborne exposure limit **(See Sections II and VIII).**

WASTE DISPOSAL METHOD: Open pit burning or burying of GD or items containing

or contaminated with GD in any quantity is prohibited. The detoxified GD (using procedures above) can be thermally destroyed by incineration in EPA approved incinerators according to appropriate provisions of Federal, state and local Resource Conservation and Recovery Act (RCRA) regulations. NOTE: Some states define decontaminated surety material as a RCRA Hazardous waste.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

CONCENTRATION	RESPIRATORY PROTECTIVE EQUIPMENT
< 0.00003 mg/m3	A full face piece, chemical canister, air-purifying protective mask will be on hand for escape. (The M9-, M17-, or M40-series masks are acceptable for this purpose. Other masks certified as equivalent may be used).
>0.00003 to 0.06 mg/m3	A NIOSH/MSHA approved pressure demand full face piece SCBA or supplied air respirators with escape air cylinder may be used. Alternatively, a full face piece, chemical canister air-purifying protective mask is acceptable for this purpose (See DA PAM 385-61 for determination of appropriate level)
0.06 mg/m3 or unknown	NIOSH/MSHA approved pressure demand full face piece SCBA suitable for use in high agent concentrations with protective ensemble (See DA PAM 385-61 for examples).

VENTILATION:
Local Exhaust: Mandatory. Must be filtered or scrubbed to limit exit concentration to < 0.00001 mg/m3. Air emissions will meet local, state and federal regulations.

Special: Chemical laboratory hoods will have an average inward face velocity of 100 linear feet per minute (lfpm) +/- 10% with the velocity at any point not deviating from the average face velocity by more than 20%. Existing laboratory hoods will have an inward face velocity of 150 lfpm +/- 20%. Laboratory hoods will be located such that cross drafts do not exceed 20% of the inward face velocity. A visual performance test using smoke producing devices will be performed in the assessment of the hood's ability to contain agent GD.

Other: Recirculation of exhaust air from agent areas is prohibited. No connection is allowed between agent areas and other areas through the ventilation systems. Emergency backup power is necessary. Hoods should be tested at least semiannually or after modification or maintenance operations. Operations should be performed 20 centimeters inside hood face.

PROTECTIVE GLOVES:

- Butyl Rubber Glove M3 and M4
- Norton, Chemical Protective Glove Set

EYE PROTECTION: As a minimum chemical goggles will be worn.

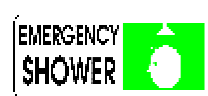
For splash hazards use goggles and face shield.

OTHER PROTECTIVE EQUIPMENT: For general lab work, gloves and lab coat will be worn with mask readily accessible. In addition, daily clean smocks, foot covers, and head covers will be required when handling contaminated lab animals.

MONITORING: Available monitoring equipment for agent GD is the M8/M9 Detector paper, detector ticket, blue band tube, M256/M256A1 kits, bubbler, Depot Area Air Monitoring System (DAAMS), Automatic Continuous Air Monitoring System (ACAMS), real time monitoring (RTM), Demilitarization Chemical Agent Concentrator (DCAC), M8/M43, M8A1/M43A2, Hydrogen Flame Photometric Emission Detector (HYFED), CAM-M1, Miniature Chemical Agent Monitor (MINICAM) and the Real Time Analytical Platform (RTAP).

Real-time, low-level monitors (with alarm) are required for GD operations. In their absence, an Immediately Dangerous to Life and Health (IDLH) atmosphere must be presumed. Laboratory operations conducted in appropriately maintained and alarmed engineering controls require only periodic low-level monitoring.

SECTION IX - SPECIAL PRECAUTIONS



PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: When handling agents, the buddy system will be incorporated. No smoking, eating and drinking in areas containing agents is permitted. Containers should be periodically inspected for leaks (either visually or by a detector kit). Stringent control over all personnel practices must be exercised. Decontamination equipment will be conveniently placed. Exits must be designed to permit rapid evacuation. Chemical showers, eyewash stations, and personal cleanliness facilities must be provided. Wash hands before meals and each worker will shower thoroughly with special attention given to hair, face, neck, and hands, using plenty of soap and water before leaving at the end of the work day.

OTHER PRECAUTIONS: GD must be double contained in liquid and vapor tight containers when in storage or when outside a ventilation hood.

For additional information see "AR 385-61, The Army Toxic Chemical Agent Safety

Program," "DA PAM 385-61, Toxic Chemical Agent Safety Standards," and "AR 40-8, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX."

SECTION X - TRANSPORTATION DATA

PROPER SHIPPING NAME: Poisonous liquids, n.o.s.

DOT HAZARD CLASSIFICATION: 6.1, Packing Group I, Hazard Zone B

DOT LABEL: Poison

DOT MARKING: Poisonous liquids, n.o.s. (Pinacolyl methyl phosphonofluoridate)

UN 2810, Inhalation Hazard

DOT PLACARD: POISON

EMERGENCY ACCIDENT PRECAUTIONS AND PROCEDURES: See **Sections IV, VII and VIII.**

PRECAUTIONS TO BE TAKEN IN TRANSPORTATION: Motor vehicles will be placarded regardless of quantity. Drivers will be given full information regarding shipment and conditions in case of an emergency. AR 50-6 deals specifically with the shipment of chemical agents. Shipments of agent will be escorted in accordance with AR 740-32.

While the Edgewood Research Development, and Engineering Center, Department of the Army believes that the data contained herein are factual and the opinions expressed are those of the experts regarding the results of the tests conducted, the data are not to be taken as a warranty or representation for which the Department of the Army or Edgewood Research Development, and Engineering Center assume legal responsibility. They are offered solely for your consideration, investigation, and verification. Any use of this data and information must be determined by the user to be in accordance with applicable Federal, State, and local laws regulations.

ADDENDUM A: ADDITIONAL INFORMATION FOR THICKENED GD

TRADE NAME AND SYNONYMS: Thickened GD, TGD.

HAZARDOUS INGREDIENTS: K125 (an acryloid copolymer, 5%) is used to thicken the GD. K125 is not known to be a hazardous material except in a finely-divided, powder form.

PHYSICAL DATA: Essentially the same as GD except for viscosity. The viscosity of TGD is approximately 1180 centistoke.

FIRE AND EXPLOSION DATA: Same as GD.

HEALTH HAZARD DATA: Same as GD except for skin contact. For skin contact, don respiratory protective mask and remove contaminated clothing. Immediately scrape the TGD from the skin surface, then wash the contaminated surface with acetone. Administer Nerve Agent Antidote Kit, MARK I, only if local sweating and muscular twitching symptoms are observed. Seek medical attention IMMEDIATELY.

SPILL, LEAK AND DISPOSAL PROCEDURES: If spills or leaks of TGD occur, follow the same procedure as those for GD, but add the following step: Since TGD is not water soluble, dissolve the TGD in acetone before introducing any decontaminating solution. Containment of TGD is generally not necessary. Spilled TGD can be carefully scraped off the contaminated surface and placed in a DOT approved container. The TGD can then be decontaminated after it has been dissolved in acetone, using the same procedures as for GD. Contaminated surfaces should be treated with acetone, then decontaminated using the same procedures as for GD.

SPECIAL PROTECTION INFORMATION: Same as GD.

SPECIAL PRECAUTIONS: Same as GD with the following addition: Handling the TGD requires careful observation of the "stringers" (elastic, thread like attachments) formed when the agents are transferred or dispensed. These stringers must be broken cleanly before moving the contaminating device or dispensing device to another location, or unwanted contamination of a working surface will result.

TRANSPORTATION DATA: Same as GD.

MATERIAL SAFETY DATA SHEET

DISTILLED MUSTARD (HD)

SECTION I - GENERAL INFORMATION

DATE: 22 September 1988
REVISED: 28 February 1996

MANUFACTURER'S ADDRESS:
U.S. ARMY CHEMICAL BIOLOGICAL DEFENSE COMMAND
EDGEWOOD RESEARCH DEVELOPMENT, AND ENGINEERING CENTER (ERDEC)
ATTN: SCBRD-ODR-S
ABERDEEN PROVING GROUND, MD 20101-5423

Emergency telephone #' s: 0700-1630 EST: 410-671-4411/4414
After: 1630 EST: 410- 278-5201, Ask for Staff Duty Officer

CAS REGISTRY NUMBERS: 505-60-2, 39472-40-7, 68157-62-0
CHEMICAL NAME:

- Bis-(2-chloroethyl)sulfide

TRADE NAMES AND SYNONYMS:

- Sulfide, bis (2-chloroethyl)
- Bis(beta-chloroethyl)sulfide
- 1,1'-thiobis(2-chloroethane)
- 1-chloro-2(beta-chloroethylthio)ethane
- Beta, beta'-dichlorodiethyl sulfide
- 2,2'dichlorodiethyl sulfide
- Di-2-chloroethyl sulfide
- Beta, beta'-dichloroethyl sulfide
- 2,2'-dichloroethyl sulfide
- H; HD; HS
- Iprit
- Kampstoff "Lost"; Lost

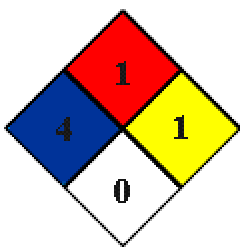
- Mustard Gas
- S-Lost; S-yperite; Schewefel-lost
- Senfgas
- Sulfur mustard; Sulphur mustard gas
- Yellow Cross Liquid
- Yperite
- Y
-

CHEMICAL FAMILY: Chlorinated sulfur compound

FORMULA/CHEMICAL STRUCTURE:
C4H8Cl2S

$$ClCH_2CH_2-S-CH_2CH_2Cl$$

NFPA 704 HAZARD SIGNAL:



Health - 4
Flammability - 1
Reactivity - 1
Special - 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENTS NAME	FORMULA	PERCENTAGE BY WEIGHT	AIRBORNE EXPOSURE LIMIT (AEL)
Sulfur Mustard	C4H8Cl2S	100	0.003 mg/m3

SECTION III - PHYSICAL DATA

BOILING POINT: 422 F 217 C

VAPOR PRESSURE (mm Hg):
- 0.072 mm Hg @ 20 C
- 0.11 mm Hg @ 25 C

VAPOR DENSITY (AIR=1): 5.5

SOLUBILITY IN WATER: Negligible. Soluble in fats and oils, gasoline, kerosene, acetone, carbon tetrachloride, alcohol, tetrachloroethane, ethylbenzoate, and ether. Miscible with the organophosphorus nerve agents.

SPECIFIC GRAVITY (H2O=1): 1.27 @ 20 C

FREEZING POINT: 14.45 C

LIQUID DENSITY (g/cc):
- 1.268 @ 25 C
- 1.27 @ 20 C

PERCENTAGE VOLATILE BY VOLUME:
- 610 mg/m3 @ 20 C
- 920 mg/m3 @ 25 C

APPEARANCE AND ODOR: Normally amber to black colored liquid with garlic or a horseradish odor. Water clear if pure. The odor threshold for HD is 0.0006 mg/m3.

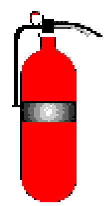
SECTION IV - FIRE AND EXPLOSION DATA

FLASHPOINT : 105 C (Can be ignited by large explosive charges)

FLAMMABILITY LIMITS (% by volume): Unknown

EXTINGUISHING MEDIA: Water, fog, foam, CO2. Avoid use of extinguishing methods that will cause splashing or spreading of HD.

SPECIAL FIRE FIGHTING PROCEDURES: All persons not engaged in extinguishing the fire should be immediately evacuated from the area. Fires involving HD should be contained to prevent contamination to uncontrolled areas. When responding to a fire alarm in buildings or areas containing agents, firefighting personnel should wear full firefighter protective clothing (without TAP clothing) during chemical agent firefighting and fire rescue operations. Respiratory protection is required. Positive pressure, full face piece, NIOSH-approved self-contained breathing apparatus (SCBA) will be worn where there is danger of oxygen deficiency and when directed by the fire chief or chemical accident/incident (CAI) operations officer. In cases where firefighters are responding to a chemical accident/incident for rescue/reconnaissance purposes they will wear appropriate levels of protective clothing (See Section VIII).



Do not breathe fumes. Skin contact with agents must be avoided at all times. Although the fire may destroy most of the agent, care must still be taken to assure the agent or contaminated liquids do not further contaminate other areas or sewers. Contact with the agent liquid or vapor can be fatal.

SECTION V - HEALTH HAZARD DATA

AIRBORNE EXPOSURE LIMIT (AEL): The AEL for HD is 0.003 mg/m3 as found in "AR 40-173, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Mustard Agents H, HD, HT." To date, the Occupational Safety and Health Administration (OSHA) has not promulgated a permissible exposure concentration for HD.

EFFECTS OF OVEREXPOSURE: HD is a vesicant (causing blisters) and alkylating agent producing cytotoxic action on the hematopoietic (blood-forming) tissues which are especially sensitive. The rate of detoxification of HD in the body is very slow and repeated exposures produce a cumulative effect. HD has been found to be a human carcinogen by the International Agency for Research on Cancer (IARC).

Median doses of HD in man are:
LD50 (skin) = 100 mg/kg ICt50 (skin) = 2000 mg-min/m3 at 70 - 80 F (humid environment) = 1000 mg-min/m3 at 90 F (dry environment)

ICt50 (eyes) = 200 mg-min/m3

ICt50 (inhalation) = 1500 mg-min/m3 (Ct unchanged with time)

LD50 (oral) = 0.7 mg/kg

Maximum safe Ct for skin and eyes are 5 and 2 mg-min/m3, respectively.

ACUTE PHYSIOLOGICAL ACTION OF HD IS CLASSIFIED AS LOCAL AND SYSTEMIC.

LOCAL ACTIONS: HD effects both the eyes and the skin. SKIN damage occurs after percutaneous absorption. Being lipid soluble, HD can be absorbed into all organs. Skin penetration is rapid without skin irritation. Swelling (blisters) and reddening (erythema) of the skin occurs after a latency period of 4-24 hours following the exposure, depending on degree of exposure and individual sensitivity. The skin healing process is very slow. Tender skin, mucous membrane and perspiration-covered skin are more sensitive to the effects of HD. HD's effect on the skin, however, is less than on the eyes. Local action on the eyes produces severe necrotic damage and loss of eyesight Exposure of eyes to HD vapor or aerosol produces lacrimation, photophobia, and inflammation of the conjunctiva and cornea.

SYSTEMIC ACTIONS: Occurs primarily through inhalation and ingestion. The HD vapor or aerosol is less toxic to the skin or eyes than the liquid form. When inhaled, the upper respiratory tract (nose, throat, tracheae) is inflamed after a few hours latency period, accompanied by sneezing, coughing, and bronchitis, loss of appetite, diarrhea, fever, and apathy. Exposure to nearly lethal doses of HD can produce injury to bone marrow, lymph nodes, and spleen as showed by a drop in white blood cell count, thus resulting in increased susceptibility to local and systemic infections. Ingestion of HD will produce severe stomach pains, vomiting, and bloody stools after a 15-20 minute latency period.

CHRONIC EXPOSURE : HD can cause sensitization, chronic lung impairment, (cough, shortness of breath, chest pain), cancer of the mouth, throat, respiratory tract and skin, and leukemia. It may also cause birth defects.

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Hold breath until respiratory protective mask is donned. Remove from the source IMMEDIATELY. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. Mouth-to-mouth resuscitation should be used when approved mask-bag or oxygen delivery systems are not available. Do not use mouth-to-mouth resuscitation when facial contamination exits. Seek medical attention IMMEDIATELY.

EYE CONTACT: Speed in decontaminating the eyes is absolutely essential. Remove the person from the liquid source, flush the eyes immediately with water for at least 15 minutes by tilting the head to the side, pulling the eyelids apart with the fingers and pouring water slowly into the eyes. Do not cover eyes with bandages but, if necessary, protect eyes by means of dark or opaque goggles. Transfer the patient to a medical facility IMMEDIATELY.

SKIN CONTACT: Don respiratory protective mask. Remove the victim from agent sources immediately. Immediately wash skin and clothes with 5% solution of sodium hypochlorite or liquid household bleach within one minute. Cut and remove contaminated clothing, flush contaminated skin area again with 5% sodium hypochlorite solution, then wash contaminated skin area with soap and water. Seek medical attention IMMEDIATELY.

INGESTION: Do not induce vomiting. Give victim milk to drink. Seek medical attention IMMEDIATELY.

SECTION VI - REACTIVITY DATA

STABILITY: Stable at ambient temperatures. Decomposition temperature is 149 C to 177 C. Mustard is a persistent agent depending on pH and moisture, and has been known to remain active for up to three years in soil.

INCOMPATIBILITY: Rapidly corrosive to brass @ 65 C. Will corrode steel at a rate of .0001 in. of steel per month @ 65 C.

HAZARDOUS DECOMPOSITION: Mustard will hydrolyze to form HCl and thiodiglycol.

HAZARDOUS POLYMERIZATION: Does not occur.

SECTION VII - SPILL, LEAK, AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: If spills or leaks occur, only personnel in full protective clothing will remain in the area **(See Section VIII)**. In case of personnel contamination **See Section V** for emergency and first aid instructions.

RECOMMENDED FIELD PROCEDURES: The HD should be contained using vermiculite, diatomaceous earth, clay or fine sand and neutralized as soon as possible using copious amounts of 5.25% sodium hypochlorite solution. Scoop up all material and clothing and place in a approved DOT container. Cover the contents of the container with decontaminating solution as above. The exterior of the container will be decontaminated and labeled according with EPA and DOT regulations. All leaking containers will be over packed with vermiculite placed between the interior and exterior containers. Decontaminate and label in accordance with EPA and DOT regulations. Dispose of the material in accordance with waste disposal methods provided below. Dispose of the decontaminate according to Federal, state and local regulations. Conduct general area monitoring with an approved monitor to confirm that the atmospheric concentrations do not exceed the airborne exposure limits **(See Sections II and VIII).**

If 5.25 % sodium hypochlorite solution is not available then the following decontaminants may be used instead and are listed in the order of preference: Calcium Hypochlorite, contamination Solution No. 2 (DS2), and Super Tropical Bleach Slurry (STB).

WARNING: Pure, undiluted calcium hypochlorite will burn on contact with liquid HD.

RECOMMENDED LABORATORY PROCEDURES: A minimum of 65 grams of decon solution per gram of HD is allowed to agitate for a minimum of one hour. Agitation is not necessary following the first hour if a single phase is obtained. At the end of 24 hours, the resulting solution will be adjusted to a pH between 10 and 11. Test for presence of active chlorine by use of acidic potassium iodide solution to give free iodine color. Place 3 ml of the decontaminate in a test tube. Add several crystals of potassium iodine and swirl to dissolve. Add 3 ml of 50 wt.% sulfuric acid:water and swirl. IMMEDIATE iodine color shows the presence of active chlorine. If negative, add additional 5.25% sodium hypochlorite solution to the decontamination solution, wait two hours, then test again for active chlorine. Continue procedure until positive chlorine is given by solution. A 10 wt.% calcium hypochlorite (HTH) mixture may be substituted for sodium hypochlorite. Use 65 grams of decon per gram of HD and continue the test as described for sodium hypochlorite. Scoop up all material and clothing and place in a approved DOT container.

Cover the contents of the container with decontaminating solution as above. The exterior of the container will be decontaminated and labeled according with EPA and DOT regulations. All leaking containers will be over packed with vermiculite placed between the interior and exterior containers. Decontaminate and label in accordance with EPA and DOT regulations. Dispose of the material in accordance with waste disposal methods provided below. Dispose of the decontaminate according to Federal, state and local regulations. Conduct general area monitoring with an approved monitor to confirm that the atmospheric concentrations do not exceed the airborne exposure limits **(See Section VIII).**

NOTE: Surfaces contaminated with HD, then rinse and decontaminated may evolve sufficient HD vapor to produce a physiological response. HD on laboratory glassware may be oxidized by its vigorous reaction with concentrated nitric acid.

WASTE DISPOSAL METHOD: Open pit burning or burying of HD or items containing

or contaminated with HD in any quantity is prohibited. Decontamination of waste or excess material will be accomplished according to the procedures outlined above can be destroyed by incineration in EPA approved incinerators according to appropriate provisions of Federal, State and local Resource Conservation Recovery Act (RCRA) regulations.

NOTE: Some states define decontaminated surety material as a RCRA hazardous waste.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

CONCENTRATION	RESPIRATORY PROTECTIVE EQUIPMENT.
< 0.003 mg/m3	A full face piece, chemical canister, air purifying protective mask will be on hand for escape. (The M9-, M17-, or M40-series masks are acceptable for this purpose. Other masks certified as equivalent may be used)
> 0.003 mg/m3	A NIOSH/MSHA approved pressure demand full face piece SCBA suitable for use in high agent concentrations with protective ensemble. (See DA PAM 385-61 for examples).

VENTILATION:

Local Exhaust: Mandatory. Must be filtered or scrubbed. Air emissions will meet local, state and federal regulations.

Special: Chemical laboratory hoods will have an average inward face velocity of 100 linear feet per minute (lfpm) +/- 10% with the velocity at any point not deviating from the average face velocity by more than 20%. Existing laboratory hoods will have an inward face velocity of 150 lfpm +/- 20%. Laboratory hoods will be located such that cross drafts do not exceed 20% of the inward face velocity. A visual performance test using smoke producing devices will be performed in assessing the ability of the hood to contain agent HD.

Other: Recirculation of exhaust air from agent areas is prohibited. No connection between agent area and other areas through the ventilation system are permitted. Emergency backup power is necessary. Hoods should be tested semiannually or after modification or maintenance operations. Operations should be performed 20 centimeters inside hoods.

PROTECTIVE GLOVES: Butyl Rubber Gloves M3 and M4 Norton, Chemical Protective Glove Set

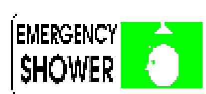
EYE PROTECTION: As a minimum, chemical goggles will be worn. For splash hazards use goggles and face shield.

OTHER PROTECTIVE EQUIPMENT: For laboratory operations, wear lab coats, gloves and have mask readily accessible. In addition, daily clean smocks, foot covers, and head covers will be required when handling contaminated lab animals.

MONITORING: Available monitoring equipment for agent HD is the M8/M9 detector paper, blue band tube, M256/M256A1 kits, bubbler, Depot Area Air Monitoring System (DAMMS), Automated Continuous Air Monitoring System (ACAMS),CAM-M1, Hydrogen Flame Photometric Emission Detector (HYFED), the Miniature Chemical Agent Monitor (MINICAM), and Real Time Analytical Platform (RTAP).

Real-time, low-level monitors (with alarm) are required for HD operations. In their absence, an Immediately Dangerous to Life and Health (IDLH) atmosphere must be presumed. Laboratory operations conducted in appropriately maintained and alarmed engineering controls require only periodic low-level monitoring.

SECTION IX - SPECIAL PRECAUTIONS



PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: When handling agents, the buddy system will be incorporated. No smoking, eating, or drinking in areas containing agents is permitted. Containers should be periodically inspected for leaks, (either visually or using a detector kit). Stringent control over all personnel practices must be exercised. Decontaminating equipment will be conveniently placed. Exits must be designed to permit rapid evacuation. Chemical showers, eyewash stations, and personal cleanliness facilities must be provided. Wash hands before meals and shower thoroughly with special attention given to hair, face, neck, and hands using plenty of soap and water before leaving at the end of the work day .

OTHER PRECAUTIONS: HD should be stored in containers made of glass for Research, Development, Test and Evaluation (RDTE) quantities or one-ton steel containers for large quantities. Agent will be double-contained in liquid and vapor tight containers when in storage.

For additional information see "AR 385-61, The Army Toxic Chemical Agent Safety Program," "DA PAM 385-61, Toxic Chemical Agent Safety Standards," and "AR 40-173, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to HD Agents H, HD, and HT."

SECTION X - TRANSPORTATION DATA

FORBIDDEN FOR TRANSPORT OTHER THAN VIA MILITARY (TECHNICAL ESCORT UNIT) TRANSPORT ACCORDING TO 49 CFR 172

PROPER SHIPPING NAME: Poisonous liquids, n.o.s.

DOT HAZARD CLASS: 6.1, Packing Group I, Hazard Zone B

DOT LABEL: Poison

DOT MARKING: Poisonous liquids, n.o.s. Bis-(2-chloroethyl) sulfide UN 2810, Inhalation Hazard

DOT PLACARD: POISON

EMERGENCY ACCIDENT PRECAUTIONS AND PROCEDURES: **See Sections IV, VII and VIII.**

PRECAUTIONS TO BE TAKEN IN TRANSPORTATION: Motor vehicles will be placarded regardless of quantity. Drivers shall be given full information regarding shipment and conditions in case of an emergency. AR 50-6 deals specifically with the shipment of chemical agents. Shipment of agents will be escorted in accordance with AR 740-32.

While the Edgewood Research Development, and Engineering Center, Department of the Army believes that the data contained herein are actual and the opinions expressed are those of the experts regarding the results of the tests conducted, the data are not to be taken as a warranty or representation for which the Department of the Army or Edgewood Research Development, and Engineering Center assume legal responsibility. They are offered solely for your consideration, investigation, and verification. Any use of these data and information must be determined by the user to be in accordance with applicable Federal, State, and local laws and regulations.

ADDENDUM A
ADDITIONAL INFORMATION FOR THICKENED HD

TRADE NAME AND SYNONYMS: Thickened HD, THD

HAZARDOUS INGREDIENTS: K125 (acryloid copolymer, 5%) is used to thicken HD. K125 is not known to be hazardous except in a finely-divided, powder form.

PHYSICAL DATA: Essentially the same as HD except for viscosity. The viscosity of HD is between 1000 and 1200 centistoke @ 25 C.

FIRE AND EXPLOSION DATA: Same as HD.

HEALTH HAZARD DATA: Same as HD except for skin contact. For skin contact, don respiratory protective mask and remove contaminated clothing IMMEDIATELY. IMMEDIATELY scrape the HD from the skin surface, then wash the contaminated surface with acetone. Seek medical attention IMMEDIATELY.

SPILL, LEAK, AND DISPOSAL PROCEDURES: If spills or leaks of HD occur, follow the same procedures as those for HD, but dissolve THD in acetone before introducing any decontaminating solution. Containment of THD is generally not necessary. Spilled THD can be carefully scraped off the contaminated surface and placed in a fully removable head drum with a high density, polyethylene lining. THD can then be decontaminated, after it has been dissolved in acetone, using the same procedures used for HD. Contaminated surfaces should be treated with acetone, then decontaminated using the same procedures as those used for HD.

NOTE: Surfaces contaminated with THD or HD and then rinse-decontaminated may evolve sufficient HD vapor to produce a physiological response.

SPECIAL PROTECTION INFORMATION: Same as HD.

SPECIAL PRECAUTIONS: Same as HD with the following addition. Handling THD requires careful observation of the "stringers" (elastic, threadlike attachments) formed when the agents are transferred or dispensed. These stringers must be broken cleanly before moving the contaminating device or dispensing device to another location, or unwanted contamination of a working surface will result.

TRANSPORTATION DATA: Same as HD.

MATERIAL SAFETY DATA SHEET

LEWISITE

SECTION I - GENERAL INFORMATION

DATE: 16 April 1988
REVISED: 27 March 1996

MANUFACTURER'S ADDRESS:
U.S. ARMY CHEMICAL BIOLOGICAL DEFENSE COMMAND EDGEWOOD RESEARCH DEVELOPMENT, AND ENGINEERING CENTER (ERDEC)
ATTN: SCBRD-ODR-S
ABERDEEN PROVING GROUND, MD 20101-5423

Emergency telephone #' s: 0700-1630 EST: 410-671-4411/4
After: 1630 EST: 410- 278-5201, Ask for Staff Duty Officer

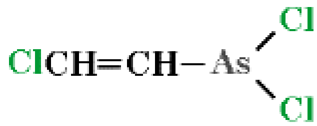
CAS REGISTRY NUMBER: 541-25-3

CHEMICAL NAME:
- Dichloro-(2-chlorovinyl) arsine

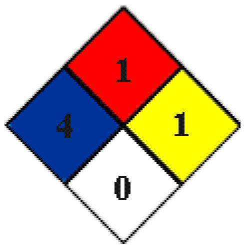
TRADE NAME AND SYNONYMS:
- Arsine, (2-chlorovinyl) dichloro-
- Arsonous dichloride, (2-chloroethenyl)
- Chlorovinylarsine dichloride
- 2-Chlorovinyldichloroarsine
- Beta-Chlorovinyldichloroarsine
- Lewisite
- L
- EA 1034

CHEMICAL FAMILY: Arsenical (vesicant)

FORMULA/CHEMICAL STRUCTURE: C2H2AsC13



NFPA 704 HAZARD SIGNAL:



Health - 4
Flammability - 1
Reactivity - 1
Special - 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENTS NAME	FORMULA	PERCENTAGE BY WEIGHT	AIRBORNE EXPOSURE LIMIT (AEL)
Lewisite	C2H2AsCl3	100	* 0.003 mg/m3

* This is a ceiling value

SECTION III - PHYSICAL DATA

BOILING POINT: 374 F 190 C

VAPOR PRESSURE (mm Hg):
- 0.35 @ 25 C
- 0.394 @ 20 C

VAPOR DENSITY (AIR=1): 7.1

SOLUBILITY: Insoluble in water and dilute mineral acids. Soluble in organic solvents, oils. and alcohol.

SPECIFIC GRAVITY (H2O=1): 1.88 @ 25 C

FREEZING POINT: 18 C to 0.1 C depending on purity

VOLATILITY: 4,480 mg/m3 @ 20 C

MOLECULAR WEIGHT: 207.32

LIQUID DENSITY: 1.89 at 20 C (Much heavier than Mustard)

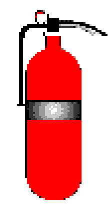
APPEARANCE AND ODOR: Pure L is a colorless oily liquid. "War gas" is an amber to dark brown liquid. A characteristic odor is usually geranium-like; very little odor when pure.

SECTION IV - FIRE AND EXPLOSION DATA

FLASHPOINT (Method Used): Does not flash

FLAMMABILITY LIMITS: N/A.

EXTINGUISHING MEDIA: Water, fog, foam, CO2. Avoid use of extinguishing methods that will cause splashing or spreading of L.



SPECIAL FIRE FIGHTING PROCEDURES: All persons not engaged in extinguishing the fire should be evacuated immediately. Fires involving L should be contained to prevent contamination of uncontrolled areas. When responding to a fire alarm in buildings or areas containing agents, firefighting personnel should wear full firefighter protective clothing (Without Tap Clothing) during chemical agent firefighting and fire rescue operations. Respiratory protection is required. Positive pressure, full face piece, NIOSH approved self-contained breathing apparatus (SCBA) will be worn where there is danger of oxygen deficiency and when directed by the fire chief or chemical accident/incident (CAI)operations officer. In cases where firefighters are responding to a chemical accident/incident for rescue/reconnaissance purposes, they will wear appropriate levels of protective clothing **(See Section VIII).**

Do not breathe fumes. Skin contact with agents must be avoided always. Although the fire may destroy most of the agent, care must still be taken to assure the agent or contaminated liquids do not further contaminate other areas or sewers. Contact with the agent liquid or vapor can be fatal.

SECTION V - HEALTH HAZARD DATA

AIRBORNE EXPOSURE LIMITS (AEL): The permissible airborne exposure concentration of L for an 8-hour workday or a 40-hour work week is an 8-hour time weighted average (TWA) of 0.003 mg/m3 as a ceiling value. A ceiling value may not be exceeded anytime. The ceiling value for Lewisite is based upon the present technologically feasible detection limits of 0.003 mg/m3. This value can be found in "DA Pam 40-173, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Mustard H, HD, HT, and L." To date, however, the Occupational Safety and Health Administration (OSHA) has not promulgated permissible exposure concentration for L.

EFFECTS OF OVEREXPOSURE: L is a vesicant (blister agent), also, it acts as a systemic poison, causing pulmonary edema, diarrhea, restlessness, weakness, subnormal temperature, and low blood pressure. In order of severity and appearance of symptoms, it is: a blister agent, a toxic lung irritant, absorbed in tissues, and a systemic poison. When inhaled in high concentrations, may be fatal in as short a time as 10 minutes. L is not detoxified by the body. Common routes of entry into the body include ocular, percutaneous, and inhalation.

TOXICOLOGICAL DATA:
Man:

- LCt50 (inhalation, man) = 1200 - 1500 mg min/m3
- LCt50 (skin vapor exposure, man) = 100,000 mg min/m3 LDLO (skin, human) = 20 mg/kg
- LCt50 (skin, man): >1500 mg/min3. L irritates eyes and skin and gives
- warning of its presence. Minimum effective dose (ED min) = 200 mg/m3 (30 min).
- ICt50 (eyes, man): < 300 mg min/m3.

Animal:

- LD50 (oral, rat) = 50 mg/kg
- LD50 (subcutaneous, rat) = 1 mg/kg
- LCtLO (inhalation, mouse) = 150 mg/m3 10m
- LD50 (skin, dog = 15 mg/kg RTECS) or 38 mg/kg (ERDEC chemical agent data sheets)
- LD50 (skin, rabbit) = 6 mg/kg
- LD50 (subcutaneous, rabbit) = 2 mg/kg
- LD50 (intravenous, rabbit) = 500 mg/kg
- LD50 (skin, guineapig) = 12 mg/kg
- LD50 (subcutaneous, guinea pig) = 1 mg/kg
- LD50 (skin, domestic farm animals) = 15 mg/kg
- LCt50 (inhalation, rat) = 1500 mg min/m3 (9 min)
- LCt50 (vapor skin, rat) = 20,000 mg min m 25 min)
- LCD50 (skin, rat) = 15 - 24 mg/kg
- LD50 (ip, dog) = 2 mg/kg
- EDmin (skin, dog) = 50 mg/m3 (30 min)
- EDmin (eye, dog) = 20 mg/m3 (30 min)
- EDmin (skin, rabbit) = 25 mg/m3 (30 min)
- EDmin (eye, rabbit) = 1 mg/m3 (30 min)

ACUTE EXPOSURE:

EYES: Severe damage. Instant pain, conjunctivitis and blepharospasm leading to closure of eyelids, followed by corneal scarring and iritis. Mild exposure produces reversible eye damage if decontaminated instantly. More permanent injury or blindness is possible within one minute of exposure.

SKIN: Immediate stinging pain increasing in severity with time. Erythema (skin reddening) appears within 30 minutes after exposure accompanied by pain with itching and irritation for 24 hours. Blisters appear within 12 hours after exposure with more pain that diminished after 2-3 days. Skin burns are much deeper than with HD. Tender skin, mucous membrane, and perspiration covered skin are more sensitive to the effects of lewisite. This, however, is counteracted by L's hydrolysis by moisture, producing less vesicant, higher vapor pressure product.

RESPIRATORY TRACT: Irritating to nasal passages and produces a burning sensation followed by profuse nasal secretion and violent sneezing. Prolonged exposure causes coughing and production of large quantities of froth mucus. In experimental animals, injury to respiratory tracts, due to vapor exposure is similar to mustard's; however, edema of the lung is more marked and frequently accompanied by pleural fluid.

SYSTEMIC EFFECTS: L on the skin, and inhaled vapor may cause systemic poisoning. A manifestation of this is a change in capillary permeability, which permit's loss of sufficient fluid from the bloodstream to cause hemoconcentration, shock and death. In nonfatal cases, hemolysis of erythrocytes has occurred with a resultant hemolytic anemia. The excretion of oxidized products into the bile by the liver produces focal necrosis of that organ, necrosis of the mucosa of the biliary passages with periobiliary hemorrhages, and some injury to the intestinal mucosa. Acute systematic poisoning from large skin burns cause's pulmonary edema, diarrhea, restlessness, weakness, subnormal temperature, and low blood pressure in animals.

CHRONIC EXPOSURE: Lewisite can cause sensitization and chronic lung impairment. Also, by comparison to agent mustard and arsenical compounds, it can be considered as a suspected human carcinogen.

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Hold breath until respiratory protective mask is donned. Remove from the source IMMEDIATELY. If breathing has stopped give artificial respiration. Mouth-to-mouth resuscitation should be used when approved maskbag or oxygen system are not available. Do not use mouth-to-mouth resuscitation when facial contamination exists. Seek medical attention IMMEDIATELY.

EYE CONTACT: Speed in decontaminating the eyes is essential. Remove the person from the liquid source, flush the eyes immediately with water for at least 15 minutes tilting the head to the side, pulling eyelids apart with fingers and pouring water slowly into the eyes. Do not cover eyes with bandages, if necessary, protect eyes by means of dark or opaque goggles. Seek medical attention IMMEDIATELY.

SKIN CONTACT: Remove the victim from the source immediately and remove contaminated clothing. Immediately decon affected areas by flushing with 10% sodium carbonate solution or liquid household bleach within one minute. After 3-4 minutes, wash off with soap and water to protect against erythema. Seek medical attention IMMEDIATELY.

INGESTION: Do not induce vomiting. Give victim milk to drink. Seek medical attention IMMEDIATELY.

SECTION VI - REACTIVITY DATA

STABILITY: Stable in steel or glass containers.

INCOMPATIBILITY: Corrosive to steel at a rate of 1 x 10 -5 to 5 x 10-5 in/month at 65 C.

HAZARDOUS DECOMPOSITION PRODUCTS: Reasonably stable; however, in presence of moisture, it hydrolyses rapidly, losing its vesicant property. It also hydrolyses in acidic medium to form HC1 and non-volatile (solid) chlorovinylarsenious oxide, which is less vesicant than Lewisite. Hydrolysis in alkaline medium, as in decontamination with alcoholic caustic or carbonate solution or Decontaminating Agent, DS(DS2), produces acetylene and trisodium arsenate (Na3AS04). Therefore, decontaminated solution would contain toxic arsenic.

SECTION VII - SPILL, LEAK, AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Only personnel in full protective clothing (See Section VIII) will be allowed in area where L is spilled. See Section V for emergency and first aid procedures.

RECOMMENDED FIELD PROCEDURES: The L should be contained using vermiculite, diatomaceous earth, clay, or fine sand and neutralized as soon as possible using copious amounts of alcoholic caustic, carbonate, or DS2. Caution must be exercised when using these decontaminates since acetylene will be given off. Household bleach can also be used if accompanied by stirring to allow contact. Scoop up all contaminated material and clothing and place in approved DOT containers. Cover with additional decontaminant. Decontaminate the outside of the container and label according to DOT and EPA requirements. All leaking containers will be over packed with vermiculite placed between interior and exterior containers. Decontaminate and lable according to EPA and DOT regulations. Dispose of as specified below. Dispose of decontaminate according to Federal, State, and local regulations. Conduct general area monitoring with an approved monitor to confirm that the atmospheric concentrations do not exceed the airborne exposure limit (See Sections II and VIII).

RECOMMENDED LABORATORY PROCEDURES: A 10 wt. % alcoholic sodium hydroxide solution is prepared by adding 100 grams of denatured ethanol to 900 grams of 10 wt.% NaOH in water. A minimum of 200 grams of decon is required for each gram of L. The decon/agent solution is agitated for a minimum of one hour. At the end of one hour the resulting pH should be checked and adjusted to above 11.5 using additional NaOH, if required. It is permitted to substitute 10 wt.% alcoholic sodium carbonate made and used in the same ratio as the NaOH listed above. Reaction time should be increased to 3-hours with agitation for the first hour. Final pH should be adjusted to above 10. It is permitted to substitute 5.25% sodium hypochlorite for the 10% alcoholic sodium hydroxide solution above. Allow one hour with agitation for the reaction. Adjustment of the pH is not required. Scoop up all contaminated material and place in an approved DOT container. Cover with additional decontaminant. Decontaminate the outside of the container and label according to DOT and EPA requirements. All leaking containers will be over packed with vermiculite placed between the interior and exterior containers. Decontaminate and label according to EPA and DOT regulations. Dispose of as specified below. Dispose of the decontaminate according to Federal, state, and local regulations. Conduct general area monitoring to confirm that the atmospheric concentrations do not exceed the airborne exposure limit (See Section VIII).

WASTE DISPOSAL METHOD: All neutralized material should be collected and contained for disposal according to land ban RCRA regulations or thermally decomposed in an EPA permitted incinerator equipped with a scrubber that will scrub out the chlorides and equipped with an electrostatic precipitator or other filter device to remove arsenic. Collect all the arsenic dust from the electrostatic precipitator or other filter device and containerize and label according to DOT and EPA regulations. The arsenic will be disposed of according to land ban RCRA regulations. Any contaminated materials or protective clothing should be decontaminated using alcoholic caustic, carbonates, or bleach analyzed to assure it is free of detectable contamination (3X) level. The clothing should then be sealed in plastic bags inside properly labeled drums and held for shipment back to the DA issue point.

NOTE: Some states define decontaminated surety material as an RCRA hazardous waste.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

CONCENTRATION	RESPIRATORY PROTECTIVE EQUIPMENT.
< 0.003 mg/m3	A full face piece, chemical canister, air purifying protective mask will be on hand for escape. (The M9-, M17-, or M40-series masks are acceptable for this purpose. Other masks certified as equivalent may be used)

> 0.003 mg/m3 or unknown	A NIOSH/MSHA approved, full face piece SCBA suitable for use in high agent concentrations with a protective ensemble. (See DA Pam 385-61)

VENTILATION

Local exhaust: Mandatory. Must be filtered or scrubbed to limit exit concentration to non-detectable level. Air emissions will meet local, state and federal regulations.

Special: Chemical laboratory hoods will have an average inward face velocity of 100 linear feet per minute (1fpm) +/- 10% with the velocity at any point not deviating from the average face velocity by more than 20%. Existing laboratory hoods will have an inward face velocity of 150 lfpm +/- 20%. Laboratory hoods will be located such that cross drafts do not exceed 20% of the inward face velocity. A visual performance test utilizing smoke producing devices will be performed in the assessment of the inclosure's ability to contain Lewisite.

Other: Recirculation of exhaust air from agent areas is prohibited. No connection between agent area and other areas through the ventilation system is permitted. Emergency backup power is necessary. Hoods should be tested semiannually or after modification or maintenance operations. Operations should be performed 20 centimeters inside hoods. Procedures should be developed for disposal of contaminated filters.

PROTECTIVE GLOVES: Norton, Chemical Protective Glove Set, Butyl Rubber Gloves M3 and M4

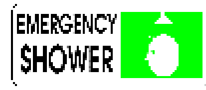
EYE PROTECTION: As a minimum, chemical goggles will be worn. For splash hazard use goggles and face-shield.

OTHER PROTECTIVE EQUIPMENT: For laboratory operations, wear lab coats, gloves and have a mask readily accessible. In addition, daily clean smocks, foot covers, and head covers will be required when handling contaminated lab animals.

MONITORING: Available monitoring equipment for agent L is the M18A2 (yellow band), bubblers (arsenic and GC method), and M256 & A1 Kits.

Real-time, low-level monitors (with alarm) are required for L operations. In their absence, an Immediately Dangerous to Life and Health (IDLH) atmosphere must be presumed. Laboratory operations conducted in appropriately maintained and alarmed engineering controls require only periodic low-level monitoring.

SECTION IX - SPECIAL PRECAUTIONS



PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: When handling agents, the buddy system will be incorporated. No smoking, eating, or drinking in areas containing agents is permitted.

Containers should be periodically inspected for leaks, either visually or using a detector kit. Stringent control over all personnel handling L must be exercised. Decontaminating equipment will be conveniently placed. Exits must be designed to permit rapid evacuation. Chemical showers, eye wash stations, and personal cleanliness facilities must be provided. Wash hands before meals and shower thoroughly with special attention given to hair, face, neck, and hands, using plenty of soap before leaving at the end of the workday.

OTHER PRECAUTIONS: L should be stored in containers made of glass for Research, DevelopmentTest and Evaluation (RDTE) quantities or one-ton steel containers for large quantities. Agent will be double contained in liquid and vapor tight containers when in storage or during transportation.

For additional information see "AR 385-61, The Army Toxic Chemical Agent Safety Program," "DA Pam 385-61, Toxic Chemical Agent Safety Standards," and "DA Pam 40-173, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Mustard H, HD, HT, and L."

SECTION X - TRANSPORTATION DATA

PROPER SHIPPING NAME: Poisonous liquids, n.o.s.

DOT HAZARDS CLASSIFICATION: 6.1, Packing Group I

DOT LABEL: Poison

DOT MARKING: Poisonous liquids, n.o.s. Dichloro-(2-chlorovinyl)arsine UN 2810

DOT PLACARD: POISON

EMERGENCY ACCIDENT PRECAUTIONS & PROCEDURES: See Sections IV, VII and VIII.

PRECAUTIONS TO BE TAKEN IN TRANSPORTATION: Motor vehicles will be placarded regardless of quantity. Drivers will be given full information regarding shipment and conditions in case of an emergency. AR 50-6 deals specifically with the shipment of chemical agents. Shipment of agents will be escorted according to AR 740-32.

MATERIAL SAFETY DATA SHEET

LETHAL NERVE AGENT (VX)

SECTION I - GENERAL INFORMATION

DATE: 14 September 1988
REVISED: 28 February 1996

MANUFACTURER'S ADDRESS:
U.S. ARMY CHEMICAL BIOLOGICAL DEFENSE COMMAND
EDGEWOOD RESEARCH DEVELOPMENT, AND ENGINEERING CENTER (ERDEC)
ATTN: SCBRD-ODR-S
ABERDEEN PROVING GROUND, MD 20101-5423

Emergency telephone #' s: 0700-1630 EST: 410-671-4411/4414
After: 1630 EST: 410- 278-5201, Ask for Staff Duty Officer

CAS REGISTRY NUMBERS: 50782-69-9, 51848-47-6, 53800-40-1, 70938-84-0

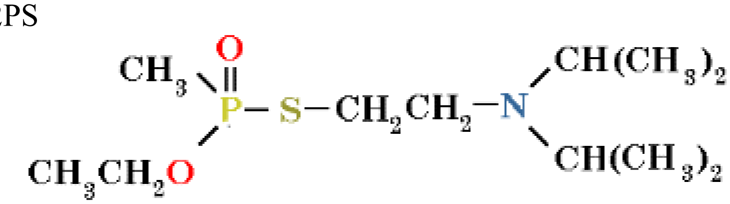
CHEMICAL NAME:
- O-ethyl-S-(2-iisopropylaminoethyl) methyl phosphonothiolate

TRADE NAME AND SYNONYMS:
- Phosphonothioic acid, methyl-, S-(2-bis(1-methylethylamino)ethyl) 0-ethyl ester
- O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothiolate
- S-2-Diisopropylaminoethyl O-ethyl methylphosphonothioate
- S-2((2-Diisopropylamino)ethyl) O-ethyl methylphosphonothiolate
- O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothioate
- O-ethyl S-(2-diisopropylaminoethyl) methylthiolphosphonoate
- S-(2-diisopropylaminoethyl) o-ethyl methyl phosphonothiolate
- Ethyl-S-dimethylaminoethyl methylphosphonothiolate
- VX
- EA 1701

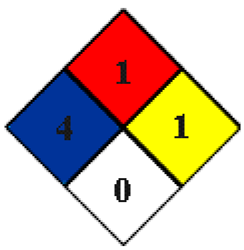
- TX60

CHEMICAL FAMILY: Sulfonated organophosphorous compound

FORMULA/CHEMICAL STRUCTURE:
C11H26NO2PS



NFPA 704 HAZARD SIGNAL:



Health - 4
Flammability - 1
Reactivity - 1
Special - 0

SECTION II - HAZARDOUS INGREDIENTS			
INGREDIENTS EXPOSURE	FORMULA	PERCENTAGE BY WEIGHT	AIRBORNE EXPOSURE LIMIT (AEL)
VX	C11H26NO2PS	100%	0.00001 mg/m3

SECTION III - PHYSICAL DATA

BOILING POINT : 298 C (568 F)

VAPOR PRESSURE (mm Hg): 0.0007 @ 20 C

VAPOR DENSITY (AIR=1): 9.2

FREEZING/MELTING POINT : Below -51 C

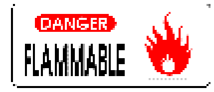
LIQUID DENSITY (g/cc): 1.0083 @ 20 C

PERCENTAGE VOLATILE BY VOLUME: 10.5 mg/m3 @ 25 C

SOLUBILITY: Slightly soluble in water at room temperature. Soluble in organic solvents.

APPEARANCE AND ODOR: Colorless to straw colored liquid & odorless, similar in appearance to motor oil.

SECTION IV - FIRE AND EXPLOSION DATA



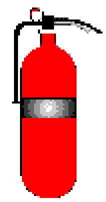
FLASHPOINT: 159 C (McCutchan - Young)

FLAMMABILITY LIMITS (% by volume): Not Available

LOWER EXPLOSIVE LIMIT: Not Applicable

UPPER EXPLOSIVE LIMIT: Not Applicable

EXTINGUISHING MEDIA: Water mist, fog, foam, $CO2$. Avoid using extinguishing methods that will cause splashing or spreading of the VX.



SPECIAL FIRE FIGHTING PROCEDURES: All persons not engaged in extinguishing the fire should be immediately evacuated from the area. Fires involving VX should be contained to prevent contamination to uncontrolled areas. When responding to a fire alarm in buildings or areas containing VX , fire fighting personnel should wear full firefighter protective clothing (without TAP clothing) during chemical agent firefighting and fire rescue operations. Respiratory protection is required. Positive pressure, full face piece, NIOSH-approved self-contained breathing apparatus (SCBA) will be worn where there is danger of oxygen deficiency and when directed by the fire chief of chemical accident/incident (CAI) operations officer. In cases where firefighters are responding to a chemical accident/incident for rescue/reconnaissance purposes they will wear appropriate levels of protective clothing **(See Section VIII).**

Do not breathe fumes. Skin contact with nerve agents must be avoided at all times. Although the fire may destroy most of the agent, care must still be taken to assure the agent or contaminated liquids do not further contaminate other areas or sewers. Contact with liquid VX or vapors can be fatal.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known.

SECTION V - HEALTH HAZARD DATA

AIRBORNE EXPOSURE LIMITS (AEL): The permissible airborne exposure concentration for VX for an 8-hour workday of a 40-hour work week is an 8-hour time weighted average (TWA) of 0.00001 mg/m3. This value can be found in "AR 40-8, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX." To date, however, the Occupational Safety and Health Administration (OSHA) has not promulgated a permissible exposure concentration for VX.

VX is not listed by the International Agency for Research on Cancer (IARC), American Conference of Governmental Industrial Hygienists (ACGIH), Occupational Safety and Health Administration (OSHA), or National Toxicology Program (NTP) as a carcinogen.

EFFECTS OF OVEREXPOSURE: VX is a lethal cholinesterase inhibitor. Doses which are potentially life-threatening may be only slightly larger than those producing least effects. Death usually occurs within 15 minutes after absorption of a fatal dosage.

VX

Route	Form	Effect	Type	Dosage
ocular	vapor	miosis	ECt50	< 0.09 mg-min/m3
inhalation	vapor	runny nose	ECt50	< 0.09 mg-min/m3
inhalation (15 1/min)	vapor	severe incapacitation	ICt50	25 mg-min/m3
inhalation (15 1/min)	vapor	death	LCt50	30 mg-min/m3
percutaneous	liquid	death	LD50	10 mg/70 kg man

Effective dosages for vapor are estimated for exposure durations of 2-10 minutes.

Symptoms of overexposure may occur within minutes or hours, depending upon the dose. They include: miosis (constriction of pupils) and visual effects, headaches and pressure sensation, runny nose and nasal congestion, salivation, tightness in the chest, nausea, vomiting, giddiness, anxiety, difficulty in thinking, difficulty sleeping, nightmares, muscle twitches, tremors, weakness, abdominal cramps, diarrhea, involuntary urination and defecation. With severe exposure symptoms progress to convulsions and respiratory failure.

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Hold breath until respiratory protective mask is donned. If severe signs of agent exposure appear (chest tightens, pupil constriction, incoordination, etc.), immediately administer, in rapid succession, all three Nerve Agent Antidote Kit(s), Mark I injectors (or atropine if directed by physician). Injections using the Mark I kit injectors may be repeated at 5 to 20 minute intervals if signs and symptoms are progressing until three series of injections have been administered. No more injections will be given unless directed by medical personnel. In addition, a record will be maintained of all injections given. If breathing has stopped, give artificial respiration. Mouth-to-mouth resuscitation should be used when approved mask-bag or oxygen delivery systems are not available. Do not use mouth-to-mouth resuscitation when facial contamination exists. If breathing is difficult, administer oxygen. Seek medical attention **IMMEDIATELY.**

EYE CONTACT: **IMMEDIATELY** flush eyes with water for 10-15 minutes, then don respiratory protective mask. Although miosis (pinpointing of the pupils) may be an early sign of agent exposure, an injection will not be administered when miosis is the only sign present. Instead, the individual will be taken **IMMEDIATELY** to a medical treatment facility for observation.

SKIN CONTACT: Don respiratory protective mask and remove contaminated clothing. Immediately wash contaminated skin with copious amounts of soap and water, 10% sodium carbonate solution, or 5% liquid household bleach. Rinse well with water to remove excess decontaminant. Administer nerve agent antidote kit, Mark I, only if local sweating and muscular twitching symptoms are observed. Seek medical attention **IMMEDIATELY** .

INGESTION: Do not induce vomiting. First symptoms are likely to be gastrointestinal. **IMMEDIATELY** administer Nerve Agent Antidote Kit, Mark I. Seek medical attention **IMMEDIATELY** .

SECTION VI - REACTIVITY DATA

STABILITY: Relatively stable at room temperature. Unstabilized VX of 95% purity decomposes at a rate of 5% a month at 71 C.

INCOMPATIBILITY: Negligible on brass, steel, aluminum.

HAZARDOUS DECOMPOSITION PRODUCTS: During a basic hydrolysis of VX up to 10% of the agent is converted to diisopropylaminoethyl methylphosphonothioic acid (EA2192). Based on the concentration of EA2192 expected to be formed during hydrolysis and its toxicity (1.4 mg/kg dermal in rabbit at 24 hours in a 10/90 wt.% ethanol/water solution), a Class B poison would result. The large scale decon procedure, which uses both HTH and NaOH, destroys VX by oxidation and hydrolysis. Typically the large scale product contains 0.2 - 0.4 wt.% EA2192 at 24 hours. At pH 12, the EA2192 in the large scale product has a half-life of about 14 days. Thus, the 90-day holding period at pH 12 results in about a 64-fold reduction of EA2192 (six half-lives). This holding period is sufficient to reduce the toxicity of the product below that of a Class B poison. Other less toxic products are ethyl methylphosphonic acid, methylphosphinic acid, diisopropyaminoethyl mercaptan, diethyl methylphosphonate, and ethanol. The small scale decontamination procedure uses sufficient HTH to oxidize all VX thus no EA2192 is formed.

HAZARDOUS POLYMERIZATION: Does not occur.

SECTION VII - SPILL, LEAK, AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: If leaks or spills occur, only personnel in full protective clothing **(See Section VIII)** will remain in area. In case of personnel contamination see **(Section V)** for emergency and first aid instructions.

RECOMMENDED FIELD PROCEDURES (For Quantities greater than 50 grams): (NOTE: These procedures can only be used with the approval of the Risk Manager or qualified safety personnel). Spills must be contained by covering with vermiculite, diatomaceous earth, clay or fine sand. An alcoholic HTH mixture is prepared by adding 100 milliliters of denatured ethanol to a 900-milliliter slurry of 10% HTH in water. This mixture should be made just before use since the HTH can react with the ethanol. Fourteen grams of alcoholic HTH solution are used for each gram of VX. Agitate the decontamination mixture as the VX is added. Continue the agitation for a minimum of one hour. This reaction is reasonablely exothermic and evolves substantial off gassing. The evolved reaction gases should be routed through a decontaminate filled scrubber before release through filtration systems. After completion of the one hour minimum agitation, 10% sodium hydroxide is added in a quantity equal to that necessary to assure that a pH of 12.5 is maintained for a period not less than 24 hours. Hold the material at a pH between 10 and 12 for a period not less than 90 days to ensure that a hazardous intermediate material is not formed **(See Section VI)**. Scoop up all material and clothing and place in a DOT approved container. Cover the contents with decontaminating solution as above. After sealing, the exterior of the container will be decontaminated and labeled according to EPA and DOT regulations. All leaking containers will be over packed with vermiculite placed between the interior and exterior containers. Decontaminate and label according to EPA and DOT regulations. Dispose of the material according to waste disposal methods provided below. Dispose of decontaminate according to Federal, State, and local regulations. Conduct general area monitoring to confirm that the atmospheric concentrations do not exceed the airborne exposure limits **(See Sections II and VIII).**

If the alcoholic HTH mixture is not available then the following decontaminants may be used instead and are listed in the order of preference: Decontaminating Agent D2 (DS2), Supertropical Bleach Slurry (STB), and Sodium Hypochlorite.

RECOMMENDED LABORATORY PROCEDURES (For Quantities less than 50 grams): If the active chlorine of the Calcium Hypochlorite (HTH) is at least 55%, then 80 grams of a 10% slurry are required for each gram of VX. Proportionally more HTH is required if the chlorine activity of the HTH is lower than 55%. The mixture is agitated as the VX is added and the agitation is maintained for a minimum of one hour. If phasing of the VX/decon solution continues after 5 minutes, an amount of denatured ethanol equal to a 10 wt.% of the total agent/decon will be added to help miscibility. Scoop up all material and clothing and place in a DOT approved container. Cover the contents with decontaminating solution as above. After sealing, the exterior of the container will be decontaminated and labeled according to EPA and DOT regulations. All leaking containers will be over packed with vermiculite placed between the interior and exteriorcontainers. Decontaminate and label according to EPA and DOT regulations. Dispose of the material according to waste disposal methods provided below. Dispose of decontaminate according to Federal, State, and local regulations. Conduct general area monitoring to confirm that the atmospheric concentrations do not exceed the airborne exposure limits **(See Sections II and VIII).**

NOTE: ETHANOL SHOULD BE REDUCED TO PREVENT THE FORMATION OF A HAZARDOUS WASTE. Upon completion of the one hour agitation the decon mixture will be adjusted to a pH between 10 and 11. Conduct general area monitoring to confirm that the atmospheric concentrations do not exceed the airborne exposure limits **(See Sections II and VIII)**.

WASTE DISPOSAL METHOD: Open pit burning or burying of VX or items containing or contaminated with VX in any quantity is prohibited. The detoxified VX (using procedures above) can be thermally destroyed by in a EPA approved incinerator in accordance with appropriate provisions of Federal, State and local Resource Conservation and Recovery Act (RCRA) regulations.

NOTE: Some states define decontaminated surety material as a RCRA Hazardous Waste.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

CONCENTRATION	RESPIRATORY PROTECTIVE EQUIPMENT
< 0.00001 mg/m3	A full face piece, chemical canister, air-purifying protective mask will be on hand for escape. (The M9-, M17-, or M40-series masks are acceptable for this purpose. Other masks certified as equivalent may be used).
>0.00001 or = 0.02 mg/m3	A NIOSH/MSHA approved pressure demand full face piece SCBA or supplied air respirators with escape air cylinder may be used. Alternatively, a full face piece, chemical canister air-purifying protective mask is acceptable for this purpose (See DA PAM 385-61for determination of appropriate level)
>0.02 mg/m3 or unknown	NIOSH/MSHA approved pressure demand full f ace piece SCBA suitable for use in high agent concentrations with protective ensemble (See DA PAM 385-61 for examples).

VENTILATION:

Local exhaust: Mandatory. Must be filtered or scrubbed to limit exit concentration to < 0.00001 mg/m3. Air emissions will meet local, state and federal regulations.

Special: Chemical laboratory hoods will have an average inward face velocity of 100 linear feet per minute (lfpm) +/- 10% with the velocity at any point not deviating from the average face velocity by more than 20%. Existing laboratory hoods will have an inward face velocity of 150 lfpm +/- 20%. Laboratory hoods will be located such that cross-drafts do not exceed 20% of the inward face velocity. A visual performance test using smoke-producing devices will be performed in assessing the ability of the hood to contain agent VX.

Other: Recirculation or exhaust air from chemical areas is prohibited. No connection between chemical areas and other areas through ventilation system is permitted. Emergency backup power is necessary. Hoods should be tested at least semiannually or after modification or maintenance operations. Operations should be performed 20 centimeters inside hood face.

PROTECTIVE GLOVES: Butyl Rubber Glove M3 and M4 Norton, Chemical Protective Glove Set

EYE PROTECTION: At a minimum chemical goggles will be worn. For splash hazards use goggles and face shield.

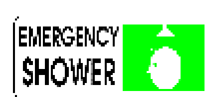
OTHER PROTECTIVE EQUIPMENT: For laboratory operations, wear lab coats, gloves and have mask readily accessible. In addition, daily clean smocks, foot covers, and head covers will be required when handling contaminated lab animals.

MONITORING: Available monitoring equipment for agent VX is the M8/M9 detector paper, detector ticket, M256/M256A1 kits, bubbler, Depot Area Air Monitoring System (DAMMS), Automated Continuous Air Monitoring System (ACAMS), Real-Time Monitor (RTM), Demilitarization Chemical Agent Concentrator (DCAC), M8/M43, M8A1/M43A1, CAM-M1, Hydrogen Flame Photometric Emission Detector (HYFED), the Miniature Chemical Agent Monitor (MINICAM), and the Real Time Analytical Platform (RTAP).

Real-time, low-level monitors (with alarm) are required for VX operations. In their absence, an Immediately Dangerous to Life and Health (IDLH) atmosphere must be presumed. Laboratory operations conducted in appropriately maintained and alarmed engineering controls require only periodic low-level monitoring.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: When handling agents the buddy system will be incorporated. No smoking, eating, and drinking in areas



containing chemicals is permitted. Containers should be periodically inspected for leaks (either visually or by a detector kit). Stringent control over all personnel practices must be

exercised. Decontamination equipment will be conveniently located. Exits must be designed to permit rapid evacuation.Chemical showers, eyewash stations and personal cleanliness facilities must be provided. Wash hands before meals, each worker will shower thoroughly with special attention given to hair, face, neck, and hands, using plenty of soap and water before leaving at the end of the workday.

OTHER PRECAUTIONS: VX must be double contained in liquid and vapor tight containers when in storage or outside a ventilation hood.

For additional information see "AR 385-61, The Army Toxic Chemical Agent Safety Program," "DA PAM 385-61, Toxic Chemical Agent Safety Standards," and "AR 40-8, Occupational Health Guidelines for the Evaluation and Control of Occupational Exposure to Nerve Agents GA, GB, GD, and VX."

SECTION X - TRANSPORTATION DATA

PROPER SHIPPING NAME: Poisonous liquids, n.o.s.

DOT HAZARD CLASS: 6.1 Packing Group I, Zone A

DOT LABEL: Poison

DOT MARKING: Poisonous liquids, n.o.s. (O-ethyl S-(2-diisopropylaminoethyl)methyl phosphonothiolate) UN 2810, Inhalation Hazard

DOT PLACARD: Poison

EMERGENCY ACCIDENT PRECAUTIONS AND PROCEDURES: **See Sections IV, VII and VIII**.

PRECAUTIONS TO BE TAKEN IN TRANSPORTATION: Motor vehicles will be placarded, regardless of quantity. Drivers will be given full information regarding shipment and conditions in case of an emergency. AR 50-6 deals specifically with the shipment of chemical agents. Shipments of agent will be escorted in accordance with AR 740-32.

APPENDIX G

SUPPLEMENTAL INFORMATION ON BIOLOGICAL AGENTS

ANTHRAX

In April and May of 1979 an Anthrax epidemic broke out in humans in the city of Sverdlovsk in the former Soviet Union. While Soviet officials attributed this outbreak to contaminated meat, the US Government maintains its position that the outbreak was due to a leakage from a biological weapons facility.

The epidemic ran intensely from 4 April to 19 April, the day the epidemic reached its peak with ten new cases. According to official Soviet reports, there were 96 victims in all. Seventeen had skin infections and survived. Seventy-nine had intestinal infections; of these, 64 died. The source of the outbreak was traced to a single 29-ton lot of bone meal (cattle feed) sold in March from a factory in Aramil, 15 kilometers to the southeast of Sverdlovsk.

While "many scientists" at the time said the new evidence supported the Soviet view, Science Magazine released a study in 1994, that appears to corroborate the US Government view.

"...Most people who contracted anthrax worked, lived, or attended daytime military reserve classes during the first week of April 1979 in a narrow zone, with its northern end in a military microbiology facility in the city and its other end near the city limit 4 km to the south; livestock died of anthrax in villages located along the extended axis of this same zone, out to a distance of 50 km..."

"...We conclude that the outbreak resulted from the windborne spread of an aerosol of anthrax pathogen, that the source was at the military microbiology facility, and that the escape of pathogen occurred during the day on Monday, 2 April. ... Most or all infections resulted from the escape of anthrax pathogen on that day."

"...A single date of inhalatory infection is also consistent with the steady decline of onset of fatal cases in successive weeks of the epidemic. "

"Accepting 2 April as the only date of inhalatory exposure, the longest incubation period for fatal cases was 43 days and the modal incubation period was 9 to 10 days...Experiments with nonhuman primates have shown, however, that anthrax spores can remain viable in the lungs for many weeks and that the average incubation period depends inversely on dose, with individual incubation periods ranging between 2 and approximately 90 days.*"

** Meselson, Matthew, Jeanne Guillemin, Martin Hugh-Jones, Alexander Langmuir, Ilona Popova, Alexi Shelokov, Olga Yampolskaya. The Sverdlovsk Anthrax Outbreak of 1979. Science: 266, 18 Nov., 1994; 1202-1208.*

TULAREMIA

The following material is from the U.S. Army Field Manual Handbook on the Medical Aspects of NBC Defensive Operations (FM 8-9)

(a) A variety of clinical forms of tularemia are seen, depending upon the route of inoculation and virulence of the strain. In humans, as few as 10-50 organisms will cause disease if inhaled or injected intradermally, whereas 108 organisms are required with oral challenge. Under natural conditions, ulceroglandular tularemia generally occurs about 3 days after intradermal inoculation (range 2-10 days), and manifests as regional lymphadenopathy, fever, chills, headache, and malaise, with or without a cutaneous ulcer. In those 5-10% of cases with no visible ulcer, the syndrome may be known as glandular tularemia. Primary ulceroglandular disease confined to the throat is referred to as pharyngeal tularemia. Oculoglandular tularemia occurs after inoculation of the conjunctivae with a hand or fingers contaminated by tissue fluids from an infected animal. Gastrointestinal tularemia occurs after drinking contaminated ground water, and is characterized by abdominal pain, nausea, vomiting, and diarrhea.

(b) Bacteremia probably is common after primary intradermal, respiratory, or gastrointestinal infection with F. tularensis and may result in septicemic or "typhoidal" tularemia. The typhoidal form also may occur as a primary condition in 5-15% of naturally-occurring cases; clinical features include fever, prostration, and weight loss, but without adenopathy. Diagnosis of primary typhoidal tularemia is difficult, as signs and symptoms are non-specific and there frequently is no suggestive exposure history. Pneumonic tularemia is a severe atypical pneumonia that may be fulminant, and can be primary or secondary. Primary pneumonia may follow direct inhalation of infectious aerosols, or may result from aspiration of organisms in cases of pharyngeal tularemia. Pneumonic tularemia causes fever, headache, malaise, substernal discomfort, and a non-productive cough; radiologic evidence of pneumonia or mediastinal lymphadenopathy may or may not be present.

(c) A biological warfare attack with F. tularensis would most likely be delivered by aerosol, causing primarily typhoidal tularemia. Many exposed individuals would develop pneumonic tularemia (primary or secondary), but clinical pneumonia may be absent or non-evident. Case fatality rates may be higher than the 5-10% seen when the disease is acquired naturally.

Venezuelan Equine Encephalitis (VEE)

The following material is from the U.S. Army Field Manual Handbook on the Medical Aspects of NBC Defensive Operations (FM 8-9)

(1) Characteristics. Eight serologically distinct viruses belonging to the Venezuelan equine encephalitis (VEE) complex have been associated with human disease; the most important of these pathogens are designated subtype 1, variants A, B and C. These agents also cause severe disease in horses, mules, and donkeys (Equidae). Natural infections are acquired by the bites of a wide variety of mosquitoes; Equidae serve as the viremic hosts and source of mosquito infection. In natural human epidemics, severe and often fatal encephalitis in Equidae always precedes that in humans. A BW attack with virus disseminated as an aerosol would cause human disease as a primary event. If Equidae were present, disease in these animals would occur simultaneously with human disease. Secondary spread by person-to-person \ contact occurs at a negligible rate. However, a BW attack in a region populated by Equidae and appropriate mosquito vectors could initiate an epizootic/epidemic.

(2) Clinical Features. Nearly 100% of those infected suffer an overt illness. After an incubation period of 1-5 days, onset of illness is extremely sudden, with generalized malaise, spiking fever, rigors, severe headache, photophobia, myalgia in the legs and lumbosacral area. Nausea, vomiting, cough, sore throat, and diarrhea may follow. This acute phase lasts 24-72 hours. A prolonged period of aesthenia and lethargy may follow, with full health and activity regained only after l-2 weeks. Approximately 4% of patients during natural epidemics develop signs of central nervous system infection, with meningismus, convulsions, coma, and paralysis. These neurologic cases are seen almost exclusively in children. The overall case-fatality rate is < 1%, but in children with encephalitis, it may reach 20%. Permanent neurological sequelae are reported in survivors. Aerosol infection does not appear to increase the likelihood of CNS disease. A VEE infection during pregnancy may cause encephalitis in the fetus, placental damage, abortion, or severe congenital neuroanatomical anomalies.

Viral Hemorrhagic Fevers (VHF)

Here is additional information on one of those agents from FM 8-9

B.07. Crimean-Congo Hemorrhagic Fever.

a. Clinical Syndrome.

(1) Characteristics. Crimean-Congo hemorrhagic fever (CCHF) is a viral disease caused by CCHF virus. The virus is transmitted by ticks, principally of the genus Hyalomma, with intermediate vertebrate hosts varying with the tick species. The disease was first recognized in the Crimea, but occurs over most of Africa, the Middle East, the Balkans, the former USSR, and eastern China. Little is known about variations in the virus properties over the huge geographic area involved. Humans become infected through tick bites, crushing an infected tick, or at the slaughter of viremic livestock. (Domestic animals become infected but do not have significant disease.) The spread of disease within hospitals has been documented with this virus and poses a potentially significant problem. Even in epidemics, cases do not show narrow clustering and person-to-person spread is rare. CCHF would probably be delivered by aerosol if used as a BW agent.

(2) Clinical Features.

(a) Typical cases present with sudden onset of fever and chills 3-12 days after tick exposure. Flushing, conjunctival injection, and mild hypotension may be present. After 2-3 days, perhaps with a temporary remission of fever, the patient develops bleeding manifestations such as petechiae, ecchymoses, oozing from puncture sites, melena, hematuria, and gastrointestinal (GI) hemorrhage. Crimean-Congo hemorrhagic fever may cause quite severe ecchymoses and extensive GI bleeding. There is severe headache, lumbar pain, nausea and vomiting, delirium, and prostration. Fatal cases are associated with extensive hemorrhage, coma, and shock. Other common physical findings are epigastric tenderness, modest hepatomegaly, and less frequently icterus.

(b) Mortality among cases recognized as hemorrhagic fever is 15-30%. Convalescence in survivors is prolonged with asthenia, dizziness, and often hair loss. Milder clinical disease occurs in an unknown proportion of infections. There may be geographic variations, possibly related to viral strain differences.

APPENDIX H

SUPPLEMENTAL INFORMATION ON SELF PROTECTION

The following material was extracted from the Centers for Disease Control World-Wide-Web site referencing universal precautions. The full site may be accessed at ***http://www.cdc.gov/ncidod/diseases/hip/universa.htm***

UNIVERSAL PRECAUTIONS FOR PREVENTION OF TRANSMISSION OF HIV AND OTHER BLOODBORNE INFECTIONS

"Universal precautions," as defined by CDC, are a set of precautions designed to prevent transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other bloodborne pathogens when providing first aid or health care. Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious for HIV, HBV and other bloodborne pathogens.

Universal precautions took the place of and eliminated the need for the isolation category "Blood and Body Fluid Precautions" in the 1983 CDC Guidelines for Isolation Precautions in Hospitals. However, implementing universal precautions does not eliminate the need for other isolation precautions, such as droplet precautions for influenza, airborne isolation for pulmonary tuberculosis, or contact isolation for methicillin-resistant *Staphylococcus aureus*.

In 1996, CDC published new guidelines (standard precautions) for isolation precautions in hospitals. Standard precautions synthesize the major features of BSI and universal precautions to prevent transmission of a variety of organisms. Standard precautions were developed for use in hospitals and may not necessarily be indicated in other settings where universal precautions are used, such as child care settings and schools.
Universal precautions apply to blood, other body fluids containing visible blood, semen, and vaginal secretions. Universal precautions also apply to tissues and to the following fluids: cerebrospinal, synovial, pleural, peritoneal, pericardial, and amniotic fluids. Universal precautions do not apply to feces, nasal secretions, sputum, sweat, tears, urine, and vomitus unless they contain visible blood. Universal precautions do not apply to saliva except when visibly contaminated with blood or in the dental setting where blood contamination of saliva is predictable.
Universal precautions involve the use of protective barriers such as gloves, gowns, aprons, masks, or protective eyewear, which can reduce the risk of exposure of the health care worker's skin or mucous membranes to potentially infective materials. In addition, under universal precautions, it is recommended that all health care workers take

precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices.

GLOVING, GOWNING, MASKING, AND OTHER PROTECTIVE BARRIERS AS PART OF UNIVERSAL PRECAUTIONS

All health care workers should routinely use appropriate barrier precautions to prevent skin and mucous membrane exposure during contact with any patient's blood or body fluids that require universal precautions.

Gloves should be worn:

- for touching blood and body fluids requiring universal precautions, mucous membranes, or nonintact skin of all patients, and
- for handling items or surfaces soiled with blood or body fluids to which universal precautions apply.

Gloves should be changed after contact with each patient. Hands and other skin surfaces should be washed immediately or as soon as patient safety permits if contaminated with blood or body fluids requiring universal precautions. Hands should be washed immediately after gloves are removed. Gloves should reduce the incidence of blood contamination of hands during phlebotomy, but they cannot prevent penetrating injuries caused by needles or other sharp instruments. Institutions that judge routine gloving for all phlebotomies is not necessary should periodically reevaluate their policy. Gloves should always be available to health care workers who wish to use them for phlebotomy. In addition, the following general guidelines apply:

I. Use gloves for performing phlebotomy when the health care worker has cuts, scratches, or other breaks in his/her skin.
II. Use gloves in situations where the health care worker judges that hand contamination with blood may occur, e.g., when performing phlebotomy on an uncooperative patient.
III. Use gloves for performing finger and/or heel sticks on infants and children.
IV. Use gloves when persons are receiving training in phlebotomy.

The Center for Devices and Radiological Health, Food and Drug Administration (FDA), has responsibility for regulating the medical glove industry. For more information about selection of gloves, call FDA at 301-443-8913.

Masks and protective eyewear or face shields should be worn by health care workers to prevent exposure of mucous membranes of the mouth, nose, and eyes during procedures that are likely to generate droplets of blood or body fluids requiring universal precautions. Gowns or aprons should be worn during procedures that are likely to generate splashes of blood or body fluids requiring universal precautions.

All health care workers should take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices during procedures; when cleaning used instruments; during disposal of used needles; and when handling sharp instruments after procedures. To prevent needlestick injuries, needles should not be recapped by hand, purposely bent or broken by hand, removed from disposable syringes, or otherwise manipulated by hand. After they are used, disposable syringes and needles, scalpel blades, and other sharp items should be placed in puncture-resistant containers for disposal. The puncture-resistant containers should be located as close as practical to the use area. All reusable needles should be placed in a puncture-resistant container for transport to the reprocessing area.

General infection control practices should further minimize the already minute risk for salivary transmission of HIV. These infection control practices include the use of gloves for digital examination of mucous membranes and endotracheal suctioning, handwashing after exposure to saliva, and minimizing the need for emergency mouth-to-mouth resuscitation by making mouthpieces and other ventilation devices available for use in areas where the need for resuscitation is predictable.

National Center for Infectious Diseases
Centers for Disease Control and Prevention
Atlanta, GA

PROTECTIVE CLOTHING

(From the North American Emergency Response Guidebook)

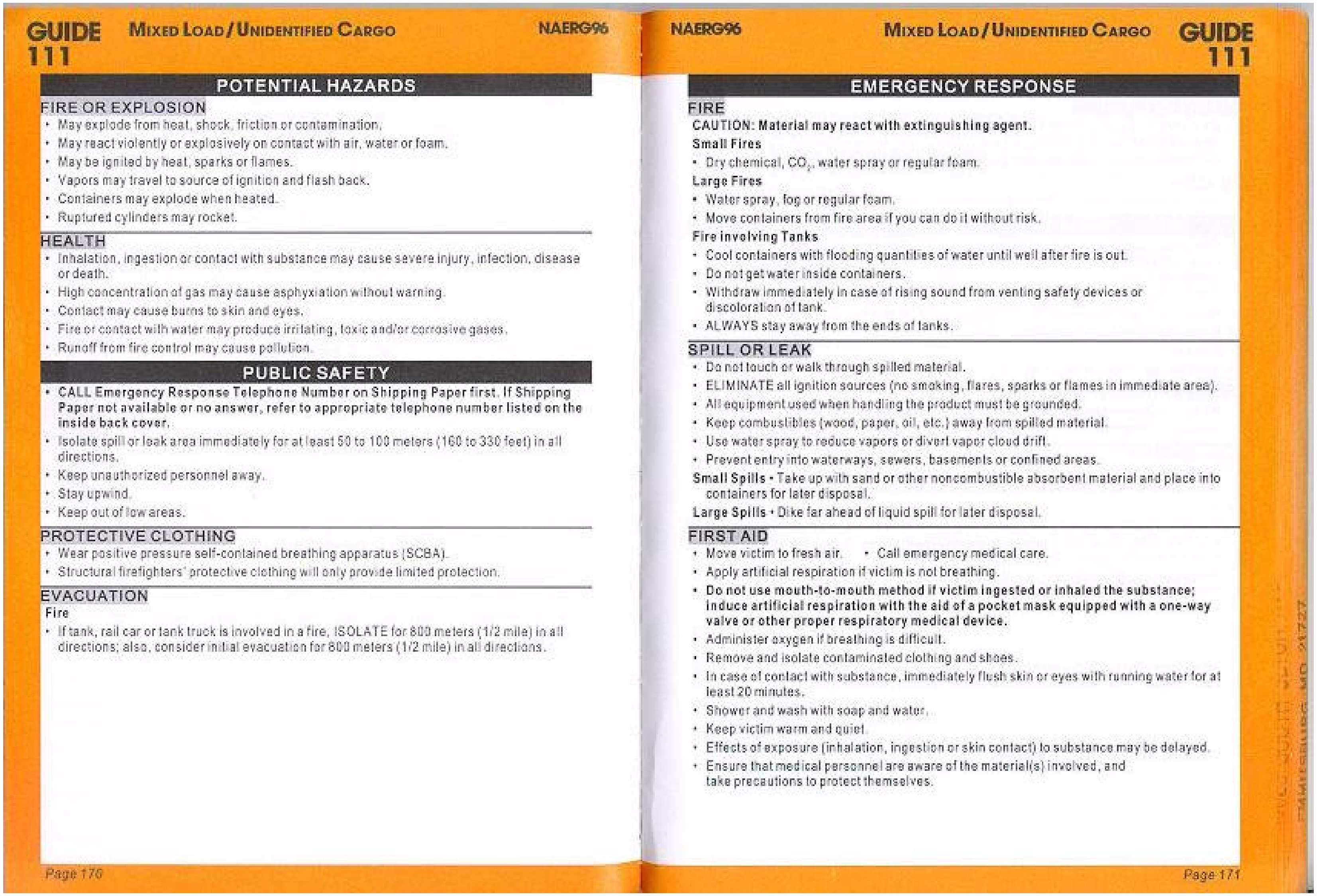
Street Clothing and Work Uniforms. These garments, such as uniforms worn by police and emergency medical services personnel, provide almost no protection from the harmful effects of dangerous goods.

Structural Fire Fighters' Protective Clothing (SFPC). This category of clothing, often called turnout or bunker gear, means the protective clothing normally worn by fire fighters during structural fire fighting operations. It includes a helmet, coat, pants, boots, gloves, and a hood to cover parts of the head not protected by the helmet and facepiece. This clothing must be used with full-facepiece positive pressure self-contained breathing apparatus (SCBA). This protective clothing should, at a minimum, meet the U.S. Department of Labor's Occupational Safety and Health Administration's (OSHA) Fire Brigade Standard (29 CFR 1910.156). Structural fire fighters' protective clothing provides limited protection from heat, but may not provide adequate protection from the harmful vapors or liquids that are encountered during dangerous goods incidents. Each guide includes a statement about the use of SFPC in incidents involving those materials referenced by that guide. Some guides state that SFPC provides limited protection. In those cases, the responder wearing SFPC and SCBA may be able to perform an expedient, that is quick "in-and-out", operation. However, this type of operation can place the responder at risk of exposure, injury or death. The incident commander makes the decision to perform this operation only if an overriding benefit can be gained (i.e., perform an immediate rescue, turn off a valve to control a leak, etc.). The coverall-type protective clothing customarily worn to fight fires in forests or wildlands is **not** SFPC and is not recommended nor referred to elsewhere in this guidebook.

Positive Pressure Self-Contained Breathing Apparatus (SCBA). This apparatus provides a constant, positive pressure flow of air within the facepiece, even if one inhales deeply while doing heavy work. Use apparatus certified by NIOSH and the Mine Safety and Health Administration in accordance with 30 CFR Part 11. Use it in accordance with the requirements for respiratory protection specified in the OSHA Hazardous Waste Site Operations and Emergency Response Standards (29 CFR 1910.120) and/or the Fire Brigade Standard (29 CFR 1910.156). Chemical-cartridge respirators or other filtering masks are not acceptable substitutes for positive pressure self-contained breathing apparatus. Demand-type SCBA does not meet the OSHA Fire Brigade Standard.

Chemical Protective Clothing and Equipment. Safe use of this type of protective clothing requires specific skills developed through training and experience. It is generally not available to, or used by, first responders. This type of special clothing may protect against one chemical, yet be readily permeated by chemicals for which it was not designed. Therefore, protective clothing should not be used unless it is compatible with the released material. This type of special clothing offers little or no protection against heat. Examples of this type of equipment have been describes as (1) Vapor Protective

Suits, also known as Totally-Encapsulating Chemical Protective (TECP) Suits or Level A protection and (2) Liquid-splash Protective Suits, also known as Level B protection. No single protective clothing will protect you from all dangerous goods. Do not assume any protective clothing is resistant to heat or flame exposure unless it is so certified by the manufacturer.



GUIDE 111 MIXED LOAD / UNIDENTIFIED CARGO NAERG96

POTENTIAL HAZARDS

FIRE OR EXPLOSION
- May explode from heat, shock, friction or contamination.
- May react violently or explosively on contact with air, water or foam.
- May be ignited by heat, sparks or flames.
- Vapors may travel to source of ignition and flash back.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

HEALTH
- Inhalation, ingestion or contact with substance may cause severe injury, infection, disease or death.
- High concentration of gas may cause asphyxiation without warning.
- Contact may cause burns to skin and eyes.
- Fire or contact with water may produce irritating, toxic and/or corrosive gases.
- Runoff from fire control may cause pollution.

PUBLIC SAFETY
- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- Isolate spill or leak area immediately for at least 50 to 100 meters (160 to 330 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Keep out of low areas.

PROTECTIVE CLOTHING
- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION
Fire
- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

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NAERG96 MIXED LOAD / UNIDENTIFIED CARGO GUIDE 111

EMERGENCY RESPONSE

FIRE
CAUTION: Material may react with extinguishing agent.

Small Fires
- Dry chemical, CO_2, water spray or regular foam.

Large Fires
- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.

Fire involving Tanks
- Cool containers with flooding quantities of water until well after fire is out.
- Do not get water inside containers.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from the ends of tanks.

SPILL OR LEAK
- Do not touch or walk through spilled material.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Use water spray to reduce vapors or divert vapor cloud drift.
- Prevent entry into waterways, sewers, basements or confined areas.

Small Spills • Take up with sand or other noncombustible absorbent material and place into containers for later disposal.

Large Spills • Dike far ahead of liquid spill for later disposal.

FIRST AID
- Move victim to fresh air. • Call emergency medical care.
- Apply artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Shower and wash with soap and water.
- Keep victim warm and quiet.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

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GUIDE 112 — EXPLOSIVES - DIVISION 1.1, 1.2, 1.3, 1.5 OR 1.6; CLASS A OR B

NAERG96

POTENTIAL HAZARDS

FIRE OR EXPLOSION

- **MAY EXPLODE AND THROW FRAGMENTS 1600 meters (1 MILE) OR MORE IF FIRE REACHES CARGO.**
- **For information on "Compatibility Group" letters, refer to Glossary section.**

HEALTH

- Fire may produce irritating, corrosive and/or toxic gases.

PUBLIC SAFETY

- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- Isolate spill or leak area immediately for at least 500 meters (1/3 mile) in all directions.
- Move people out of line of sight of the scene and away from windows.
- Keep unauthorized personnel away.
- Stay upwind.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Structural firefighters' protective clothing will only provide limited protection.

EVACUATION

Large Spill

- **Consider initial evacuation for 800 meters (1/2 mile) in all directions.**

Fire

- If rail car or trailer is involved in a fire and heavily encased explosives such as bombs or artillery projectiles are suspected, ISOLATE for 1600 m (1 mile) in all directions; also, initiate evacuation including emergency responders for 1600 m (1 mile) in all directions.
- When heavily encased explosives are not involved, evacuate the area for 800 meters (1/2 mile) in all directions.

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EXPLOSIVES - DIVISION 1.1, 1.2, 1.3, 1.5 OR 1.6; CLASS A OR B — GUIDE 112

EMERGENCY RESPONSE

FIRE

CARGO Fires

- **DO NOT fight fire when fire reaches cargo! Cargo may EXPLODE!**
- Stop all traffic and clear the area for at least 1600 meters (1 mile) in all directions and let burn.
- Do not move cargo or vehicle if cargo has been exposed to heat.

TIRE or VEHICLE Fires

- **Use plenty of water - FLOOD it! If water is not available, use CO_2, dry chemical or dirt.**
- If possible, and WITHOUT RISK, use unmanned hose holders or monitor nozzles from maximum distance to prevent fire from spreading to cargo area.
- Pay special attention to tire fires as re-ignition may occur. Stand by with extinguisher ready.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Do not touch or walk through spilled material.
- DO NOT OPERATE RADIO TRANSMITTERS WITHIN 100 meters (330 feet) OF ELECTRIC DETONATORS.
- **DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST.**

FIRST AID

- Move victim to fresh air. • Call emergency medical care.
- Apply artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

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POTENTIAL HAZARDS

HEALTH

- **TOXIC; Extremely Hazardous.**
- May be fatal if inhaled or absorbed through skin.
- Initial odor may be irritating or foul and may deaden your sense of smell.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control may cause pollution.

FIRE OR EXPLOSION

- These materials are extremely flammable.
- May form explosive mixtures with air.
- May be ignited by heat, sparks or flames.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- Vapors may travel to source of ignition and flash back.
- Runoff may create fire or explosion hazard.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

PUBLIC SAFETY

- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- Isolate spill or leak area immediately for at least 100 to 200 meters (330 to 660 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Keep out of low areas.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing which is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing is recommended for fire situations ONLY; it is not effective in spill situations.

EVACUATION

Spill

- See the Table of Initial Isolation and Protective Action Distances for highlighted substances. For non-highlighted substances, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.

EMERGENCY RESPONSE

FIRE

- **DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED.**

Small Fires

- Dry chemical, CO_2, water spray or regular foam.

Large Fires

- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

Fire involving Tanks

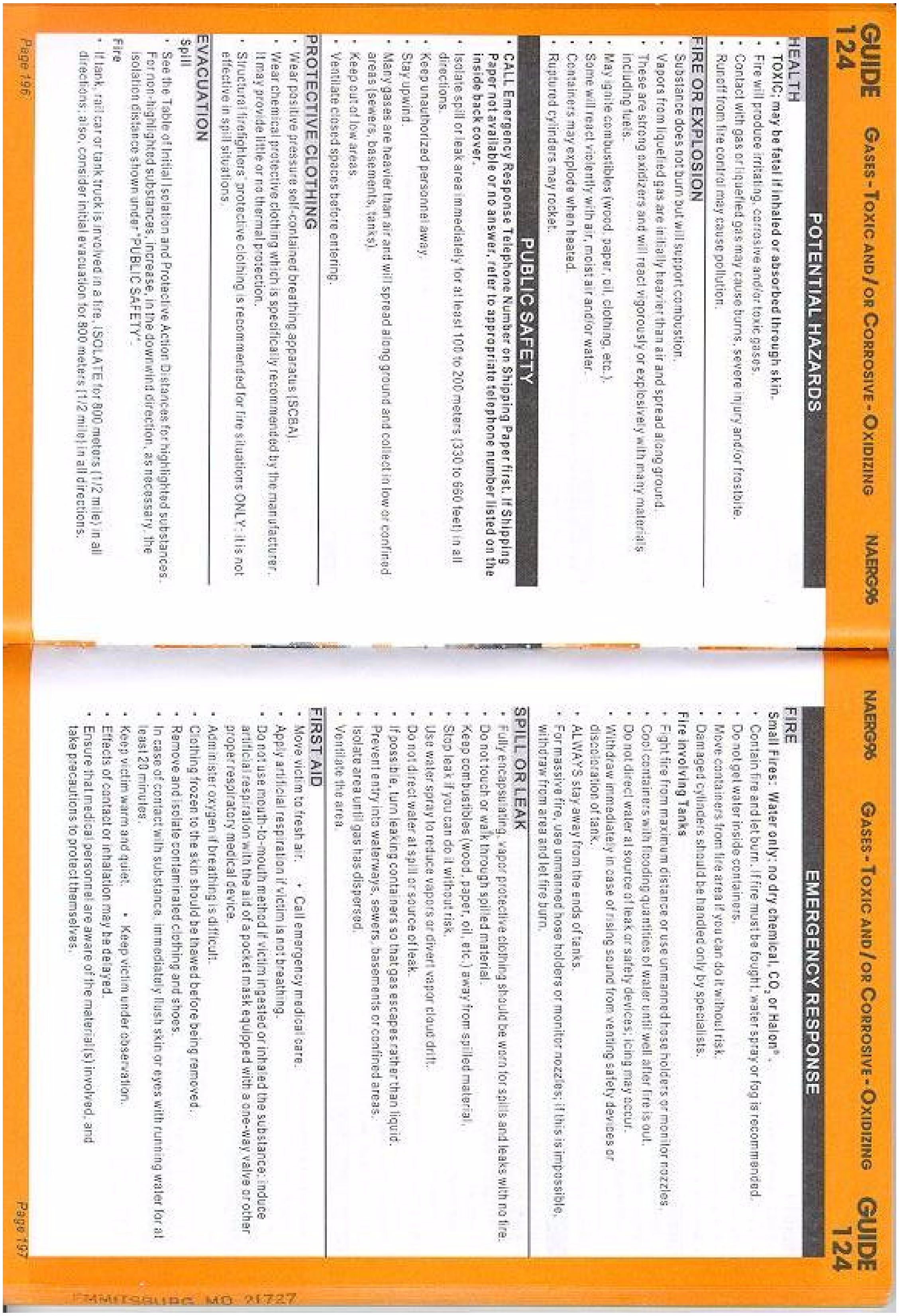
- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from the ends of tanks.

SPILL OR LEAK

- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- All equipment used when handling the product must be grounded.
- Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire.
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift.
- Do not direct water at spill or source of leak.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Isolate area until gas has dispersed.
- Consider igniting spill or leak to eliminate toxic gas concerns.

FIRST AID

- Move victim to fresh air. • Call emergency medical care.
- Apply artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- In case of contact with liquefied gas, thaw frosted parts with lukewarm water.
- Keep victim warm and quiet. • Keep victim under observation.
- Effects of contact or inhalation may be delayed.
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.



GUIDE 124 — GASES - TOXIC AND/OR CORROSIVE - OXIDIZING — NAERG96

POTENTIAL HAZARDS

HEALTH

- **TOXIC; may be fatal if inhaled or absorbed through skin.**
- Fire will produce irritating, corrosive and/or toxic gases.
- Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite.
- Runoff from fire control may cause pollution.

FIRE OR EXPLOSION

- Substance does not burn but will support combustion.
- Vapors from liquefied gas are initially heavier than air and spread along ground.
- These are strong oxidizers and will react vigorously or explosively with many materials including fuels.
- May ignite combustibles (wood, paper, oil, clothing, etc.).
- Some will react violently with air, moist air and/or water.
- Containers may explode when heated.
- Ruptured cylinders may rocket.

PUBLIC SAFETY

- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- Isolate spill or leak area immediately for at least 100 to 200 meters (330 to 660 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks).
- Keep out of low areas.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING

- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing which is specifically recommended by the manufacturer. It may provide little or no thermal protection.
- Structural firefighters' protective clothing is recommended for fire situations ONLY; it is not effective in spill situations.

EVACUATION

Spill

- See the Table of Initial Isolation and Protective Action Distances for highlighted substances. For non-highlighted substances, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire

- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

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NAERG96 — GASES - TOXIC AND/OR CORROSIVE - OXIDIZING — GUIDE 124

EMERGENCY RESPONSE

FIRE

Small Fires: Water only; no dry chemical, CO_2 or Halon®.

- Contain fire and let burn. If fire must be fought, water spray or fog is recommended.
- Do not get water inside containers.
- Move containers from fire area if you can do it without risk.
- Damaged cylinders should be handled only by specialists.

Fire involving Tanks

- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Cool containers with flooding quantities of water until well after fire is out.
- Do not direct water at source of leak or safety devices; icing may occur.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from the ends of tanks.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK

- Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire.
- Do not touch or walk through spilled material.
- Keep combustibles (wood, paper, oil, etc.) away from spilled material.
- Stop leak if you can do it without risk.
- Use water spray to reduce vapors or divert vapor cloud drift.
- Do not direct water at spill or source of leak.
- If possible, turn leaking containers so that gas escapes rather than liquid.
- Prevent entry into waterways, sewers, basements or confined areas.
- Isolate area until gas has dispersed.
- Ventilate the area.

FIRST AID

- Move victim to fresh air. • Call emergency medical care.
- Apply artificial respiration if victim is not breathing.
- Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
- Administer oxygen if breathing is difficult.
- Clothing frozen to the skin should be thawed before being removed.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Keep victim warm and quiet. • Keep victim under observation.
- Effects of contact or inhalation may be delayed.
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

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GUIDE 153 SUBSTANCES - TOXIC AND/OR CORROSIVE (COMBUSTIBLE) NAERG96

POTENTIAL HAZARDS

HEALTH
- **TOXIC**; inhalation, ingestion, or skin contact with material may cause severe injury or death.
- Contact with molten substance may cause severe burns to skin and eyes.
- Avoid any skin contact.
- Effects of contact or inhalation may be delayed.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may be corrosive and/or toxic and cause pollution.

FIRE OR EXPLOSION
- Combustible material: may burn but does not ignite readily.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors, and sewers explosion hazards.
- Some may polymerize (P) explosively when heated or involved in a fire.
- Contact with metals may evolve flammable hydrogen gas.
- Containers may explode when heated.
- Runoff may pollute waterways
- Substance may be transported in a molten form.

PUBLIC SAFETY
- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- Isolate spill or leak area immediately for at least 25 to 50 meters (80 to 160 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Keep out of low areas.
- Ventilate enclosed areas.

PROTECTIVE CLOTHING
- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing which is specifically recommended by the manufacturer.
- Structural firefighters' protective clothing is recommended for fire situations ONLY; it is not effective in spill situations.

EVACUATION
Spill
- See the Table of Initial Isolation and Protective Action Distances for highlighted substances. For non-highlighted substances, increase, in the downwind direction, as necessary, the isolation distance shown under "PUBLIC SAFETY".

Fire
- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

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NAERG96 SUBSTANCES - TOXIC AND/OR CORROSIVE (COMBUSTIBLE) GUIDE 153

EMERGENCY RESPONSE

FIRE
Small Fires
- Dry chemical, CO_2 or water spray.

Large Fires
- Dry chemical, CO_2, alcohol-resistant foam or water spray.
- Move containers from fire area if you can do it without risk.
- Dike fire control water for later disposal; do not scatter the material.

Fire involving Tanks or Car/Trailer Loads
- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from the ends of tanks.

SPILL OR LEAK
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Stop leak if you can do it without risk.
- Prevent entry into waterways, sewers, basements or confined areas.
- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- DO NOT GET WATER INSIDE CONTAINERS.

FIRST AID
- Move victim to fresh air.
- Call emergency medical care.
- Apply artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim warm and quiet.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

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POTENTIAL HAZARDS

HEALTH
- Inhalation of vapors or dust is extremely irritating.
- May cause burning of eyes and flow of tears.
- May cause coughing, difficult breathing and nausea.
- Brief exposure effects last only a few minutes.
- Exposure in an enclosed area may be very harmful.
- Fire will produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause pollution.

FIRE OR EXPLOSION
- Some of these materials may burn, but none ignite readily.
- Containers may explode when heated.

PUBLIC SAFETY
- **CALL Emergency Response Telephone Number on Shipping Paper first. If Shipping Paper not available or no answer, refer to appropriate telephone number listed on the inside back cover.**
- Isolate spill or leak area immediately for at least 25 to 50 meters (80 to 160 feet) in all directions.
- Keep unauthorized personnel away.
- Stay upwind.
- Keep out of low areas.
- Ventilate closed spaces before entering.

PROTECTIVE CLOTHING
- Wear positive pressure self-contained breathing apparatus (SCBA).
- Wear chemical protective clothing which is specifically recommended by the manufacturer.
- Structural firefighters' protective clothing is recommended for fire situations ONLY; it is not effective in spill situations.

EVACUATION
Large Spill
- Consider initial downwind evacuation for at least 100 meters (330 feet).

Fire
- If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

EMERGENCY RESPONSE

FIRE
Small Fires
- Dry chemical, CO_2, water spray or regular foam.

Large Fires
- Water spray, fog or regular foam.
- Move containers from fire area if you can do it without risk.
- Dike fire control water for later disposal; do not scatter the material.

Fire involving Tanks or Car/Trailer Loads
- Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
- Do not get water inside containers.
- Cool containers with flooding quantities of water until well after fire is out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- ALWAYS stay away from the ends of tanks.
- For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

SPILL OR LEAK
- Do not touch or walk through spilled material.
- Stop leak if you can do it without risk.
- Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire.

Small Spills
- Take up with sand or other noncombustible absorbent material and place into containers for later disposal.

Large Spills
- Dike far ahead of liquid spill for later disposal.
- Prevent entry into waterways, sewers, basements or confined areas.

FIRST AID
- Move victim to fresh air. • Call emergency medical care.
- Apply artificial respiration if victim is not breathing.
- **Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.**
- Administer oxygen if breathing is difficult.
- Remove and isolate contaminated clothing and shoes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- For minor skin contact, avoid spreading material on unaffected skin.
- Keep victim warm and quiet.
- Effects should disappear after individual has been exposed to fresh air for approximately 10 minutes.
- Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

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GLOSSARY

GLOSSARY

Absorption. The process of an agent being taken in by a surface (clothing, fabrics, wood, etc.,) much like a sponge and water.

Actual Breakthrough Time. The average time elapsed between initial contact of the chemical with the outside surface of the fabric and the detection time.

Acetylcholine. A chemical compound formed from an acid and an alcohol which causes muscles to contract (neurotransmitter). It is found in various organs and tissues of the body. It is rapidly broken down by an enzyme, cholinesterase.

Acetylcholinesterase. An enzyme that hydrolyses the neurotransmitter acetylcholine. The action of this enzyme is inhibited by nerve agents.

Acetylcholinesterase. An enzyme (a protein produced in the cells) which stops (inactivates) the action of acetylcholine by separating the acetylcholine into its components of acetic and choline. This occurs as soon as acetycholine has produced a muscle contraction. Nerve agents combine with acetylcholinesterase to prevent it from performing its inactivation of acetylcholine.

Adsorption. The process of an agent sticking to or becoming chemically attached to a surface.

Aerosol. Fine liquid or solid particles suspended in air; for example, fog or smoke.

Aerosols. A suspension or dispersion of small particles (solids or liquids) in a gaseous medium.

Agent Dosage. The concentration of a toxic vapor in the air multiplied by the time that the concentration is present

Antibiotic. A substance that inhibits the growth of or kills microorganisms.

Anticholinergic. An agent or chemical that blocks or impedes the action of acetylcholine, such as the (also cholinolytic) antidote atropine.

Anticholinesterase. A substance which blocks the action of cholinesterase (acetylcholinesterase) such as nerve agents.

Antidote. A substance which neutralizes toxic agents or their effects.

Antisera. The liquid part of blood containing antibodies.

Arsenical. Pertaining to or containing arsenic; a reference to the vesicant lewisite.

Atropine. A medication used as an antidote for nerve agents.

Atropine. An anticholinergic used as an antidote for nerve agents to counteract excessive amounts of acetylcholine. It also has other medical uses.

Bacteria. Single-celled organisms that multiply by cell division and that can cause disease in humans, plants or animals.

BDO. Battle Dress Overgarment; Multi-piece suit used by the military for protection against chemical warfare agents.

B-NICE. Pertaining to biological, nuclear, incendiar, chemical, or explosives.

Biochemicals. The chemicals that make up or are produced by living things.

Biological warfare agents. Living organisms or the materials derived from them that cause disease in or harm humans, animals, or plants, or cause deterioration of material. Biological agents may be used as liquid droplets, aerosols, or dry powders.

Biological warfare. The intentional use of biological agents as weapons to kill or injure humans, animals, or plants, or to damage equipment.

Bioregulators. Biochemicals that regulate bodily functions. Bioregulators that are produced by the body are termed "endogenous." Some of these same bioregulators can be chemically synthesized.

Blister Agent. A chemical warfare agent which produces local irritation and damage to the skin (vesicant) and mucous membranes, pain and injury to the eyes, reddening and blistering of the skin, and when inhaled, damage to the respiratory tract.

Blood Agent. A chemical warfare agent which is inhaled and absorbed into the blood. The blood (cyanogen) carries the agent to all body tissues where it interferes with the tissue oxygenation process.

Cas Registry Number. A number assigned to a material by the Chemical Abstract Service to provide a single unique identifier.

Choking agents: Substances that cause physical injury to the lungs. Exposure is through inhalation. In extreme cases, membranes swell and lungs become filled with liquid. Death results from lack of oxygen; hence the victim is "choked".

Blister agents: Substances that cause blistering of the skin. Exposure is through liquid or vapor contact with any exposed skin (eyes, skin, lunge). (Mustard Gas)

Blood agents: Substances that injure a person by interfering with cell respiration (the exchange of oxygen and carbon dioxide between blood and tissues).

Causative agent. The organism or toxin that is responsible for causing a specific disease or harmful effect.

Ceiling Exposure Value. The maximum airborne concentration of a biological or chemical agent to which a worker may be exposed at any time.

Chemical agent. A chemical substance that is intended for use in military operations to kill, seriously injure, or incapacitate people through its physiological effects. Excluded from consideration are riot control agents, and smoke and flame materials. The agent may appear as a vapor, aerosol, or liquid; it can either be a casualty/toxic agent or an incapacitating agent.

Chemical Agent Symbol. A code usually consisting of two letters that are used as a designation to identify chemical agents, e.g., GB for the chemical agent sarin.

Chemical Contamination. The presence of a chemical agent on a person, object, or area.

Chemical Warfare Agent. A chemical substance which, because of its physiological, psychological, or pharmacological effects, is intended for use in military operations to kill, seriously injure, or incapacitate humans (or animals) through its toxicological effects. Excluded are riot control agents, chemical herbicides, and smoke and flame agents.

Choking Agents. These agents exert their effects solely on the lungs and result in the irritation of the alveoli of the lungs. Agents cause the alveoli to constantly secrete watery fluid into the air sacs, which is called pulmonary edema. When a lethal amount of a choking agent is received, the air sacs become so flooded that the air cannot enter and the victim dies of anoxia (oxygen deficiency); also known as dry land drowning.

Classification of Chemical Agents. Chemical agents are classified according to their physical state, use and physical action.

CNS. Pertaining to the central nervous system.

CNS Depressants: Compounds that have the predominant effect of depressing or blocking the activity of the central nervous system. The primary mental effects include the disruption of the ability to think, sedation, and lack of motivation.

CNS Stimulants: Compounds that have the predominant effect of flooding the brain with too much information. The primary mental effect is loss of concentration, causing indecisiveness and the ability to act in a sustained, purposeful manner.

Concentration. The amount of a chemical agent present in a unit volume of air, usually expressed in milligrams per cubic meter (mg/m^3.)

Concentration Time. The amount of a chemical agent present in a unit volume of air multiplied by the time an individual is exposed to that concentration.

Contagious. Capable of being transmitted from one person to another.

Conjunctivitis. Redness in the eye.

Consequence Management. Measures to alleviate the damage, loss, hardship, or suffering caused by emergencies. It includes measures to restore essential government service, protect public health and safety, and provide emergency relief to affected governments, businesses, and individuals.

Containment. The attempt to prevent the spreading of contamination by holding it in, enclosing, encapsulating, or by controlling it.

Crisis Management. Measures to resolve the hostile situation, investigate, and prepare a criminal case for persecution under Federal law.

Cryogenics. Materials which exist at extremely low temperatures, such as nitrogen.

Culture. A population of micro-organisms grown in a medium.

Cumulative. Additional exposure rather than repeated exposure. For example, a one hour exposure of HD followed within a few hours by another exposure of one hour, had the same effect as a single exposure lasting for two hours.

Cutaneous. Pertaining to the skin.

CWA. Chemical Warfare Agents

Decontamination. The process of making any person, object, or area safe by absorbing, destroying, neutralizing, making harmless, or removing the hazardous material.

Desorption. The reverse process of absorption. The agent will be “removed” from the surface (outgassing).

Dilution Factor. Dilution of contaminated air with uncontaminated air in a general area, room, or building for the purpose of health hazard or nuisance control, and/or for heating and cooling.

Dosage. The concentration of a chemical agent in the atmosphere (C) multiplied by the time (t) the concentration remains, expressed as mg-min/m. The dosage (Ct) received by a person depends upon how long he is exposed to the concentration. That is, the respiratory dosage in mg-min/m is equal to the time in minutes as individual is unmasked in an agent cloud multiplied by the concentration of the cloud. The dosage is equal to the time of exposure in minutes of an individual's unprotected skin multiplied by the concentration of the agent cloud.

Downwind Distance. The distance a toxic agent vapor cloud will travel from its point of origin, with the wind.

Evaporation Rate. The rate at which a liquid changes to vapor at normal room temperature.

Fungi. Any group of plants mainly characterized by the absence of chlorophyll, the green colored compound found in other plants. Fungi range from microscopic single-celled plant (such as mold and mildews) to large plants (such as mushrooms).

G-series nerve agents. Chemical agents moderate to high toxicity developed in the 1930's. Examples are tabun (GA), sarin (GB), and soman (GD).

Host. An animal or plant that harbors or nourishes another organism. IDLH. Concentrations immediately dangerous to life and health.

Hydration. The combining of a substance with water.

Hydrolysis. The reaction of any chemical substance with water by which decomposition of the substance occurs and one or more new substances are produced.

IDLH. Concentrations immediately dangerous to life and health.

Incapacitating agents. Produce temporary physiological and/or mental effects via action on the central nervous system. Effects may persist for hours or days, but victims usually do not require medical treatment. However, such treatment speeds recovery:

Industrial agents. Chemicals developed or manufactured for use in industrial operations or research by industry, government, or academia. These chemicals are not primarily manufactured for the specific purpose of producing human causalities or rendering equipment, facilities, or areas dangerous for use by man. Hydrogen cyanide, cyanogen chloride, phosgene, chloropicrin and many herbicides and pesticides are industrial chemicals that also can be chemical agents.

Infectious agents. Biological agents capable of reproducing in an infected host.

Infectivity. (1) The ability of an organism to spread. (2) The number of organisms required to cause and infection to secondary hosts. (3) The capability of an organism to spread out from the site of infection and cause disease in the host organism. Infectivity also can be viewed as the number of organisms required to cause an infection.

Initial Downwind Vapor Hazard Area. Areas initially established to evacuate all unprotected personnel and to prevent other unprotected personnel from entering and thus encountering agent vapors or any other type of contamination.

Integrated Emergency Command Structure (IECS). A system that allows for the integration of both career and volunteer fire/rescue personnel by equal rank for purposes of on scene incident command (Montgomery County fire service definition).

Latent Period. Specifically, in the case of mustard, the period between exposure and onset of signs and symptoms; otherwise, an incubation period.

Lethal Chemical Agent. An agent that may be used effectively in a field concentration to produce death.

Level A Protection. The level of protective equipment in situations where the material is considered acutely vapor toxic to the skin and hazards are unknown. Full encapsulation, air tight chemical suit with SCBA or SABA.

Level B Protection. The level of protective equipment in situations where the environment is not considered acutely vapor toxic to skin but may cause respiratory effects. Chemical splash suit or full coverage non-air tight chemical suit with SCBA or SABA.

Level C Protection. The level of protective equipment required to prevent respiratory exposure but not to exclude possible skin contact. Chemical splash suit with cartridge respirator.

Level D Protection. The level of protective equipment required when the atmosphere contains no known hazard, when splashes, immersions, inhalation, or contact with hazardous levels of any chemical is precluded. Work uniform such as coveralls, boots, leather glovers, and hard hat.

Liquid Agent. A chemical agent that appears to be an oily film or droplets. The color ranges from dear to brownish amber.

Median Incapacitating Dosage (ICT50). The volume of a chemical agent vapor or aerosol inhaled that is sufficient to disable 50% of exposed, unprotected people (expressed as mg-min/m^3).

Median Lethal Dosage (LCT50). The amount of liquid chemical agent expected to kill 50 percent of a group of exposed, unprotected individuals.

Median Incapacitating Dosage (ID50). The volume of a liquid chemical agent expected to incapacitate 50 percent of a group of exposed, unprotected individuals.

Methods of Dissemination. The way a chemical agent or compound is finally released into the atmosphere.

Miosis. A condition where the pupil of the eye becomes contracted (pinpointed) which impairs night-vision.

M8 Chemical Agent Detector Paper. A paper used to detect and identify liquid V- and G-type nerve agents and H-type blister agents.

M256 kit. A kit that detects and identifies vapor concentrations of nerve, blister, and blood agents.

Mycotoxin. A toxin produced by fungi.

Micro-organism. Any organism, such as bacteria, viruses, and some fungi, that can be seen only with a microscope.

Mustard (vesicants) agents. See ***Blister agent***.

N.B.C. Nuclear, Biological and Chemical.

Nerve agents. Substances that interfere with the central nervous system. Exposure is primary through contact with the liquid (skin and eyes) and secondarily through inhalation of the vapor. Three distinct symptoms associated with nerve agents are: pin-point pupils, an extreme headache, and severe tightness in the chest.

Nonpersistent agent. An agent that upon release loses its ability to cause casualties after 10 to 15 minutes. It has a high evaporation rate and is lighter than air and will disperse rapidly. It is considered to be a short-term hazard. However, in small unventilated areas, the agent will be more persistent.

Organism. Any individual living thing, whether animal or plant.

Organophosphate. A compound with a specific phosphate group which inhibits acetycholinesterase. Use in chemical warfare and as an insecticide.

Organophosphorus compound. A compound, containing the elements phosphorus and carbon, whose physiological effects include inhibitation of acetylcholinesterase. Many pesticides (malathion and parathion) and virtually all nerve agents are organophosphorus compounds.

Parasite. Any organism that lives in or on another organism without providing benefit in return.

Pathogen. Any organism (usually living) capable of producing serious disease or death, such as bacteria, fungi, and viruses.

Pathogenic agent. Biological agents capable of causing serious diseases.

PEL. Permissible exposure limit. An occupational health term used to describe exposure limits for employees. Usually described in time weighted averages (TWA) or short term exposure limits (STEL).

Percutaneous agent. Able to be absorbed through the body.

Permeation. The process by which a chemical moves through a protective clothing.

Permeation Rate. The rate at which the challenge chemical permeates the fabric.

Persistent Agent. An agent that upon release retains its casualty-producing effects for and extended period of time, usually anywhere from 30 minutes to several days. A persistent agent usually has a low evaporation rate and its vapor is heavier than air. Therefore, its vapor cloud tends to hug the ground. Its considered to be a long-term hazard. Although inhalation hazards are still a concern, extreme caution should be taken to avoid skin contact as well.

Persistent Agent. An agent that remains in the target area for loner periods of time. Hazards from both vapor and liquid may exist for hours, days, or in exceptional cases, weeks, or months after dissemination of the agent. As a general rule, persistent agents duration will be greater than 12 hours.

Precursor. A chemical substance required for the manufacture of chemical agent.

Physiological Action. Most toxic chemical agents are used for their toxic effects that is to produce a harmful physiological reaction when applied to the human body externally, or when breathed, or taken internally. This reaction of chemical agents, within the body or on the body, is the physiological action.

Rate of Action. The rate at which the body reacts to or is affected by a chemical substance or material.

Rate of Detoxification. The rate at which the body can counteract the effects of a poisonous chemical substance.

Rate of Hydrolysis. The rate at which the various chemical agents or compounds are decomposed by water.

Reconnaissance (RECON). A primary survey to gather information.

Respiratory Dosage. This is equal to the time in minutes an individual is unmasked in an agent cloud multiplied by the concentration of the cloud.

Rickettsia. Any of a family (Rickettsiaceae) of pleomorphic rod-shaped nonfilterable microorganisms that cause various diseases (as typhus).

Rhinorrhea. A runny nose.

SABA. Supplied air breathing apparatus.

SCBA. Self-contained breathing apparatus.

Sensitize. To become highly responsive or easily receptive to the effects of toxic chemical agents after the initial exposure.

Short Term Exposure Limit (STEL). A 15-minute time-weighted average exposure which should not be exceeded at any time during a work day even if the 8-hour time-weighted average (TWA) is within the threshold limit value (TLV.) Exposures at the STEL should not be repeated more than four times a day and there should be at least 60 minutes between successive exposures at the STEL.

Skin Dosage. This is equal to the time of exposure in minutes of an individual's unprotected skin multiplied by the concentration of the agent cloud.

Solubility. The ability of a material to dissolve in water or another liquid.

Solvent. A material which is capable of dissolving another chemical.

Source Strength. The weight of a chemical agent that is at the chemical accident/incident site and may be released into the environment.

Specific Gravity. The weight of a liquid compared to the weight of an equal volume of water.

Spore. A reproductive form some micro-organisms can take to become resistant to environmental conditions, such as extreme heat or cold, while in a "resting phase".

Tear agents: Produce irritating or disabling effects such as a large flow of tears and intense eye pain and irritation of the skin that rapidly disappear within minutes after exposure.

Terrorism. A violent act or an act dangerous to human life, in violation of the criminal laws of the United States or any segment to intimidate or coerce a government, the civilian population or any segment thereof, in furtherance of political or social objectives (US Department of Justice).

Time-Weighted Average (TWA). The average concentration for a normal 8-hour workday and a 40-hour work week, to which nearly all workers may be repeatedly exposed without adverse effect.

Toxicity. A measure of the harmful effect produced by a given amount of toxin on a living organism. The relative toxicity of. an agent can be expressed in milligrams of toxin needed per kilogram of body weight to kill experimental animals.

Toxicity. The property a material possesses which enables it to injure the physiological mechanism of an organism by chemical means, with the maximum effect being incapacitation or death.

Triage. Sorting. A technique of establishing rescue, decontamination, treatment and transportation priorities in any event where the number of casualties overwhelm the resources of the emergency response organizations.

Upwind. In or toward the direction from which the wind blows. To be upwind of an item, the wind would be blowing from your position to the item.

Urticant. A chemical agent that produces irritation at the point of contact, resembling a stinging sensation, such as a bee sting. For example, the initial physiological effects of phosgene oxime (CX) upon contact with a person's skin.

Urticaria. A skin condition characterized by intensely itching red, raised patches.

V-series nerve agents. Chemical agents of the moderate to high toxicity developed in the 1950's. They are generally persistent.

Vaccine. A preparation of killed or weakened micro-organism products used to artificially induce immunity against a disease.

Vapor agent. A gaseous form of a chemical agent. If heavier than air, the cloud will be dose to the ground, if lighter than air, the cloud will rise and disperse more quickly.

Vapor Density. A comparison of any gas or vapor to the weight of an equal amount of air.

Vesicant Agent. An agent that acts on the eyes and lungs and blisters the skin.

Vesicles. Blisters on the skin.

Virus. An infectious micro-organism that exists as a particle rather than as a complete cell. Particle sizes range from 200 to 400 nanometers (one-billionth of a meter). Viruses are not capable of reproducing outside of a host cell.

Viscosity. The degree to which a fluid resists flow.

Volatility. A measure of how readily a substance will vaporize.

Volatility. With chemical agents, it refers to their ability to change from a liquid state into a gaseous state. (The ability of a material to evaporate.)

Vomiting agents: Produce nausea and vomiting effects, can also cause coughing, sneezing, pain in the nose and throat, nasal discharge, and tears.

Wheal. An acute swelling of the skin. This condition is common to a bee sting.