Introduction to Homeland Security

Chapter 4

Terrorist-Related Hazards

**Terrorist-Related Hazards**

The threat or risk posed by terrorism has introduced an expanded, and in some cases, new set of hazards.

These new hazards join the numerous traditional natural and technological hazards.

**4 Principal Categories of Terrorist-Related Hazards**

1) Chemical Agents
2) Biological Agents
3) Radiological/ Nuclear Agents
4) Explosives
Differences Between Terrorism and Traditional Hazards

- Traditional hazards are well known
  - Years of research
  - Actual occurrence
  - Response and recovery experience
- Not so with terrorism
  - Knowledge and experience limited at best

Differences Between Terrorism and Traditional Hazards (cont.)

- Traditional hazards occur because of:
  - Natural processes
    - Geological
    - Meteorological
    - Hydrological
  - Human processes
    - Accident
    - Oversight
    - Negligence
- Terrorist hazards are deliberate and are done for the sake of creating death, destruction, and fear

Who is vulnerable?

- Major US cities?
- Rural areas?
- US interests abroad?
- Where will terrorists strike next?

Everyone is a potential victim to some degree
Conventional Explosives and Secondary Devices

- Have existed for centuries
- Traditional and Improvised Explosive Devices (IEDs)
  - Easy to obtain and use
  - Can inflict massive amounts of destruction to property and can cause significant injuries and fatalities to humans
  - Can be used to disperse other agents

Conventional Explosives and Secondary Devices

- Explosive
  - Uses physical destruction caused by the expansion of gases that result from the ignition of explosive material
    - Pipe bombs
    - Satchel charges
    - Conventional munitions

Conventional Explosives and Secondary Devices

- Incendiary
  - Relies on the ignition of fires to cause physical destruction
    - Molotov cocktails
    - Napalm
Conventional Explosives and Secondary Devices

- Delivery systems
  - Missile devices
    - Rocket
    - RPG
    - Mortar
    - Air-dropped bomb
  - Vehicles
    - Hand carried/placed

- Detonation mechanisms
  - Timers
  - Remotes
    - Radio
    - Cell phone
  - Sensors
    - Light
    - Air pressure
    - Movement
    - Magnetic
    - Pressure

Explosives are the most common terrorist device
- Involve ~70% of all attacks
- Easy to obtain
- Easy to construct
- Extremely effective terror-spreading device
- < 5% are preceded by a warning
Chemical Agents

- Have been around for centuries
  - Used extensively in:
    - WW I
    - WW II (extermination camps)
    - Iran/Iraq War
- Intended to kill, seriously injure, or incapacitate people through physiological effects

Chemical Agents

- Can enter the body via:
  - Inhalation
  - Ingestion
  - The skin or eyes

Chemical Agents

- Categories
  - Nerve Agents
  - Blister Agents (aka vesicants)
  - Blood (or Cyanogen) Agents
  - Choking/Pulmonary Agents
  - Irritants (tear gas, pepper spray)
  - Incapacitating Agents (BZ, Agent 15)
Chemical Agents: Nerve

- Attack the nervous system by interfering with the proper functioning of neurotransmitters
- Tabun (GA), Sarin (GB), VX
- Ingestion, respiration, or contact
- Believed to have been used by Saddam Hussein on 16 MAR 1988 against the Kurdish village of Halabja
  - Over 5,000 villagers killed, mostly women and children

Chemical Agents: Blistering

- Chemical compounds that causes severe skin, eye, and mucosal pain and irritation
  - Burn skin and internal tissue areas upon contact
- Sulfur mustards, Nitrogen mustards, Lewisite
- Used in:
  - WWI
  - WWII
  - Iran-Iraq War (83-88)

Chemical Agents: Choking

- Designed to impede breathing
- Chlorine gas, phosgene
- Absorbed through the respiratory system
- Used by:
  - British during the Crimean War
  - Union during the US Civil War
  - Germans, French, and British during WWI
Chemical Agents: Blood

- Chemical compounds carried by the blood for distribution through the body
  - Toxic effect at the cellular level
- Zyklon B (hydrogen cyanide)
- Absorbed through the respiratory system
- Used by the Nazis during the Holocaust

Chemical Agents

- Delivery mechanisms
  - Aerosol devices
    - Liquid
    - Solid (powder)
    - Gas
  - Explosives
  - Breach of containers
  - Mixing with water or food supplies
  - Direct placement on target/victim

Chemical Agents

- Most chemical attacks are generally recognized immediately
- Can be:
  - Persistent (hour to weeks or longer) or:
  - Non-persistent (10-15 minutes)
- Effects are usually fast and severe
- Identification can be difficult
- Without proper training, response can be dangerous
Biological Agents

- Natural or modified organisms (bacteria or viruses) or the toxic byproducts generated by living organisms
- Cause illness, injury, or death in humans, livestock, or plants
- Use dates back to the early 14th century
- Have been "weaponized" over the past 100 years

Biological Agents

- Can be dispersed overtly or covertly
- Can be difficult to recognize
  - Effects may take up to weeks to appear
- Infected subject may be contagious to others
- Recognition made through:
  - Identification of a credible threat
  - Discovery of weapons material
  - Victim diagnosis

Biological Agents

- Can disrupt the economy or industry
- Detection will most likely be made by public health personnel
- Primary defense is recognition
  - Best achieved through proper 1st responder and public health training
Biological Agents - Categories

- Group A
  - Great potential for causing public health catastrophe
  - May be easily spread over a large geographic area
    - Anthrax
    - Smallpox
    - Plague
    - Botulism
    - Tularemia
    - Viral hemorrhagic fevers

Biological Agents – Anthrax

- Bacillus anthracis
  - Bacterium that forms deadly spores
- Can be exposed via:
  - Skin (cutaneous)
    - Accounts for 95% of cases
    - 20% mortality rate (w/o antibiotics)
  - Lungs (inhalation)
    - 80% or higher mortality rate
  - Digestive (gastrointestinal)
    - 25-50+% mortality rate
- Vaccine only available to certain people
  - 92.5 effective (estimated)

Biological Agents - Categories

- Group B
  - Low mortality rate
  - May be easily spread over a large geographic area
    - Salmonella
    - Ricin
    - Q fever
    - Typhus
    - Glanders
Biological Agents - Categories

- Group C
  - Common pathogens that have potential for being engineered for terrorism or weapons purposes
    - Hantavirus
    - Tuberculosis

Biological Agents – Attack Indicators

- Stated threat
- Unusual occurrence of dead or dying animals
- Unusual casualties or illness
  - Unusual illness for a region/area
  - Definite pattern inconsistent with natural disease
- Unusual liquid, spray vapor, or powder
  - Spraying
  - Suspicious devices, packages, or letters

Biological Agents: Attacks in the US

- Dalles, Wasco County, Oregon - 1984
  - A religious group, the Rajneeshees, infected the town’s water supply and at least ten local restaurant salad bars with the Salmonella typhimurium
  - 751 people became ill
  - Purpose of the attack was to reduce voter turnout in local elections in order to elect religious followers to local office
Biological Agents: Attacks in the US – Anthrax Mailings

- Anthrax mailings, 5 letters - Sept 18, 2001
  - FL - AMI
  - NY – NBC, ABC, CBS, NY Post
- Anthrax mailings, 2 letters - Oct 12, 2001
  - Senate offices of Senate Majority Leader Thomas Daschle and Senate Judiciary Committee head, Patrick Leahy

- 23 people are infected
  - 5 deaths
- Dr. Steven Hatfill originally an FBI “person of interest”
- Dr. Bruce Ivins later became the focus of the investigation
  - Ivins committed suicide 1 Aug 08, while the matter was still before a federal grand jury
Nuclear/Radiological Weapons

- Utilize the movement of energy through space and through material
- Primary uses for terrorism:
  - Detonation of a nuclear bomb
  - Dispersal of radioactive material
  - Attack on a facility housing nuclear material

Nuclear/Radiological Weapons

- Nuclear weapons
  - Most devastating
  - Most difficult to develop or acquire, thus least likely
  - Cause damage through:
    - Blast (includes shock and heat wave)
    - Subsequent radiation (can last for years)

Nuclear/Radiological Weapons – Forms of Attack

- Improvised Nuclear Device (IND)
- Radiological Dispersion Devices (RDDs, aka “dirty bombs”)
  - Simple explosives that spread radioactive material upon detonation
  - Effective at spreading terror
  - Not nearly as dangerous as nuclear weapons
- RDDs not involving explosives
Nuclear/Radiological Weapons – Response

- Response may be difficult
  - Radiation compounds problem
  - Involvement of radiological material may not be obvious
  - Radiological threat can be widespread and long term
    - Chernobyl

Combined Hazards

- Terrorists can combine two or more methods to achieve a synergistic effect (end result greater than if the two methods were employed separately)
- Agents may be combined to achieve both immediate and delayed consequences

Combined Hazards (cont.)

- Combinations can complicate or delay diagnosis
- Multiple agents can take advantage of the reduced effectiveness of certain protective measures
- Multiple incidents can be deployed in single or multiple municipalities
### Role of CDC in Preparedness and Response

- Centers for Disease Control and Prevention (CDC) have become full partners in the nation's emergency management system
  - CDC would be the chief public health entity to respond to a WMD incident
  - CDC would assist and advise the lead federal agency and the state and local health departments
  - CDC could deploy the National Pharmaceutical Stockpile