# Haz Mat First Responder
# OPERATIONS —
# Weapons of Mass Destruction/WMD Class
(For Nuclear, Biological, Chemical & Explosive Weapons)

## Participant Notebook

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California Governor's Office of Emergency Services, (Cal OES), California Specialized Training Institute (CSTI), Hazardous Materials Section

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(Edition 5.0)

# A

## *California Specialized Training Institute*

| | |
|---|---|
| **Block Title:** | Welcome and FRO WMD Class Overview |
| **Class:** | Hazardous Materials: FRO–WMD |
| **Block Scope:** | Instructor to provide an overview on the purpose, scope and need for a WMD class, make necessary administrative announcements, and divide the class into appropriate teams and exercise groups. |
| **Block Main Points:** | Formal Welcoming Remarks<br>Introductions<br>WMD Class Purpose & Scope<br>Administrative Information<br>Need for WMD Training<br>Haz Mat OSHA Response Levels<br>Role & Goal of the First Responder<br>Wrap-up, Issues & You |
| **Support Material:** | *See Block Note Sheet/Outline, Data Sheets, Issue Sheet, Activity Sheet and Work Sheet on following pages* |
| **Additional References:** | *See Appendix E (NBC+E Bibliography) for further references as needed* |
| **Time Recommended:** | 30 Minutes |

Block A

# *Welcome & FRO WMD Class Overview*

## Main Points

- Formal Welcoming Remarks
- Introductions
- WMD Class *Purpose* & Scope
- Administrative Information
- Need for WMD Training
- Haz Mat OSHA Response *Levels*
- *Role* & Goal of the First Responder
- Wrap-up, Issues & You

# BLOCK NOTE SHEET/OUTLINE

- **Formal Welcoming Remarks**
  - Host Location Welcoming Remarks
  - Course Manager's Welcoming Remarks

- **Introductions**
  - Instructors
  - Participants

- **WMD Class Purpose & Scope**
  - "WMD" = Any Potential Use of an "NBC+E" Weapon
  - "NBC+E" = Nuclear, Biological, Chemical + Explosive Weapons
  - Class Goal & Objectives
  - Class Limited Scope
  - Class End Result

- **Administrative Information**
  - Breaks/Lunch
  - Eating/Drinking in Classroom
  - Pagers & Cell Phones in Classroom
  - Bathrooms
  - Schedule & Critique Sheet
  - Participant Reference Book & Handouts
  - Class Groups/Teams
  - Certificate Requirements, etc.

- **Need for WMD Training**
  - Existence of the Terrorist Threat & Vulnerability of Attack on Our Society
  - Infrequency of Events, Unique Actions & Deadly Consequences
  - Need for Ongoing Training & Preparation

- **Haz Mat OSHA Response Levels**
  - Per 29 CFR 1910.120 (q)/Title 8 CCR 5192 (q):
    - First Responder AWARENESS (FRA)
    - First Responder OPERATIONS (FRO)
    - Technician (TECH)
    - Specialist (SPEC)
    - Incident Commander (IC)
  - Per Fed & Cal OSHA – FROs:
    - Initially,
    - To Protect Life/Health, Environment & Property,
    - In a DEFENSIVE Fashion!

- **Role & Goal of the First Responder**
  - Per CSTI – *FRO's* Role is to Respond:
    - Safely & Competently, within
    - *"FRO"* Level, Resources & Capabilities
  - Per CSTI – *FRO's* Goal is to Protect (in order):
    - Life & Health (incl. public & responders),
    - Crime Scene Preservation
    - Environment, and
    - Property

- **Role & Goal of the First Responder (cont.)**
  - NOTE: Need to Balance:
    - #1 - Priority Lifesaving Activities, with
    - #2 – Evidence Preservation

- **Wrap-up, Issues & You**
  - Block Key Point Summary
  - Block Key *Response* Issues:
  - Your Issues/Questions?

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***"Kill one – Frighten ten thousand."***

*(Sun Tsu)*

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## BLOCK DATA SHEETS - *FRO WMD Course Purpose*

*Goal:* At the conclusion of the "First Responder OPERATIONS – Weapons of Mass Destruction" (FRO WMD) Class, the participants will be able to better recognize the presence of Weapons of Mass Destruction (WMD), including "Nuclear, Biological, Chemical or Explosive" (NBC+E) weapons, and implement actions to protect themselves and the public from the effects of an NBC+E incident (those actions taken should be "Defensive" in nature). This is a "Specialty" Course that compliments CSTI's "Hazardous Materials First Responder Operations" (FRO) Course.

*Terminal Objectives: By the end of the following blocks, the participant will be able to:*

(A) Identify the purpose, scope and need for a "WMD" Course at the OSHA "FRO" level;

(B) Define WMD and Terrorism, describe the current threat of terrorism in the United States (including the use of NBC+E weapons on local vulnerabilities via a "Threat Assessment" system); identify ways to prevent or deter a terrorist event; identify and describe the general types of NBC+E weapons (including the hazards each present to responders); describe the similarities and differences between a traditional Haz Mat and WMD incident; understand the FRO "Role" and "Goals" at a WMD incident; and understand need to balance life safety with evidence preservation;

(C) Identify the indicators that would help first responders recognize when an incident may involve NBC+E weapons (including identifying at least one recognition clue and physiological sign/symptom for each type of NBC+E weapon); and know the value and limits of "IDHA" to validate incident information;

(D1) Understand the need to coordinate with typical WMD first responders; understand the function and structure of the Incident Command System; understand mass casualty implications and decontamination requirements; describe the first responder actions upon discovery of an incident that potentially involves NBC+E weapons; identify sources of assistance (including the current ERG); identify basic actions to follow for each general type of NBC+E weapon; and develop a "personal mind jogger" for initial priority FRO response actions;

(E1) Describe the past uses of NBC+E weapon by terrorists or others (listing appropriate recognition clues and initial response actions for these incidents);

(F1) Given a simulated N, B, C or E scenario, recognize the presence of the N, B, C or E weapon, conduct a safe identification and hazard assessment using the current ERG, and identify FRO response actions (including safety procedures, isolation distances, required notifications, and additional agencies and resources needed for the N, B, C or E scenario);

(G1) Understand the main points of the class; identify at least one "Key Response Issue" for follow-up action to increase the participant's ability to safely and competently respond to an NBC+E incident; and be aware of additional WMD training available to responders.

*As assessed by the instructor (instructors may use Work Sheets, the Tabletop Exercise, or observations to see if participants have met the course objectives.* ***If class is SLGCP funded, a CSTI Certified FRO WMD exam will be administered, covering the objectives above – Passing score is 70% or greater****).*

## BLOCK DATA SHEETS - *WMD FRO vs. Haz Mat FRO*

The CSTI First Responder Operations (FRO) "Weapons of Mass Destruction" (WMD) Class is a "Specialty" class, designed to enhance the FRO's ability to recognize a hazardous materials incident involving Nuclear, Biological, Chemical and Explosive (NBC+E) weapons, and to take safe initial actions to protect themselves and the public from the N, B, C or E weapon release. It is based on CSTI's full Hazardous Materials First Responder Operations Course.

PLEASE NOTE: Due to the time constraints, this class is limited in scope to providing a basic overview on NBC+E weapons. Although the uncontrolled release of an N, B, C or E weapon is considered by OSHA to be a hazardous material/substance emergency response, *this "FRO WMD" class does **NOT** meet the initial OSHA training requirements for "First Responder Operations" found in 29 CFR 1910.120 (q)/Title 8 CCR 5192 (q).* This specialty class may be considered refresher training, and may meet the OSHA part of the FRO requirements, but it does not meet all of the listed competencies for the FRO level related to all hazardous materials. ***NOR** does this course meet state certification standards (more stringent than OSHA requirements) for the FRO level, found in Title 19, CCR 2510-2560.*

For additional information on OES/CSTI's state certified full FRO course . . . See the OES Web Site (WWW.OES.CA.GOV) or the instructor.

For additional information and/or references regarding Nuclear, Biological, Chemical or Explosive weapons, see APPENDIX E – NBC+E BIBLIOGRAPHY or ask the instructor.

The next two pages provide excerpts from 29 CFR 1910.120 (q) and Title 8, CCR 5192 (q), also known as Fed OSHA and Cal OSHA "HAZWOPER." They are both identical in text in defining the First Responder AWARENESS (FRA) and First Responder OPERATIONS (FRO) levels, and in listing minimum initial training hours and competencies for each of those levels. The full documents can be provided by Fed or Cal OSHA, or on CSTI's Web Site: WWW.OES.CA.GOV.

## BLOCK DATA SHEETS - *Haz Mat FRA*

***(A) First Responder, Awareness Level (FRA):***

*First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release. First responders at the awareness level shall have sufficient training or have had sufficient experience to objectively demonstrate competencies in the following areas:*

1. *An understanding of what hazardous substances are, and the risks associated with them in an incident.*
2. *An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.*
3. *The ability to recognize the presence of hazardous substances in an emergency.*
4. *The ability to identify the hazardous substances, if possible.*
5. *An understanding of the role of the first responder awareness individual in the employer's emergency response plan (including site security and control), and the U.S. Department of Transportation's Emergency Response Guidebook.*
6. *The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.*

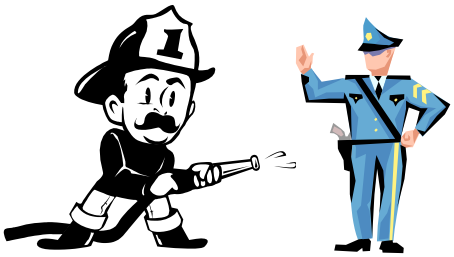
## BLOCK DATA SHEETS - *Haz Mat FRO*

***(A) First Responder, Operations Level (FRO):***

*First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purposes of protecting nearby persons, property or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures. First responders at the operations level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level; and the employer shall so certify:*

1. *Knowledge of basic hazard and risk assessment techniques.*
2. *Know how to select and use proper PPE provided to the first responder operations level.*
3. *An understanding of basic hazardous materials terms.*
4. *Know how to perform basic control, containment and/or confinement operations and rescue injured or contaminated persons within the capabilities of the resources and PPE available to their unit.*
5. *Know how to implement basic equipment, victim and rescue personnel decontamination procedures.*
6. *An understanding of relevant standard operating procedures and termination procedures.*

Additional information on training courses meeting these competencies can be provided by the instructor.



## BLOCK SUMMARY SHEET

*"WMD" Defined:* For the purposes of this class, any incident that may potentially involve Nuclear, Biological, Chemical or Explosive (NBC+E) weapons.

*Class Goal:* At the conclusion of this class, "First Responders" at the "Operations" (FRO) level will be able to recognize the potential presence of "WMD," including "NBC+E" weapons, and implement safe initial "defensive" actions to protect themselves and the public from the N, B, C or E weapon release.

*Class Scope:* This is a six to eight hour "Specialty" class (based on CSTI's Haz Mat FRO Course), limited in scope to a basic overview on NBC+E weapons. FOR MORE INFORMATION SEE: "NBC+E Bibliography" in the back of this notebook.

*End Result:* Better protection of "WMD FROs," so that they can safely initiate defensive response actions to protect the public in the event of an N, B, C or E incident.

*Class Need:* WMD incidents, although infrequent, will occur – The threat is real!
The U.S. is a free and open society, vulnerable to a terrorist NBC+E attack!
FROs must be prepared and trained to recognize WMD/NBC+E weapons, and initiate defensive response actions for a potentially large number of victims!

*OSHA "FRO" Defined:* "…individuals who respond to a release or potential release of hazardous substance as part of the initial response to the site for the purposes of protecting nearby persons, property or the environment from the effects of the release. They are trained in a defensive fashion without actually trying to stop the release . . ."

*FRO's "Role":* Safely and competently respond, within FRO level, resources and capabilities.

*FRO's "Goals":* Better Protect (in order): Life and Health, Crime Scene, Environment & Property (balancing priority lifesaving activities with evidence preservation at a WMD crime scene).

*Bottom Line:* Need on-going training and preparation to safely and competently respond to a WMD/NBC+E incident, in a manner that protects themselves, so that they can better initiate defensive actions to better protect the public from NBC+E incidents.

# BLOCK ISSUES SHEET

Focus on **K**ey **R**esponse **I**ssues (**KRI**) in every Block of Instruction!

Ask yourself "**What is your KRI**?"

It may be a major ***FRO response question*** or problem, which needs to be ***addressed*** (before, during or after the WMD incident), AND requires you to take ***action***:

Get an answer, or develop a Mind Jogger tool, when you return ***back home***, in order to be a ***safe & competent FRO at an WMD incident in your jurisdiction/agency.***

Here are some ideas (Pick one, rank them or select your own **KRI**):

- ☑ With all the anxiety of the 9/11/01 attack, what is my jurisdiction's real WMD problem?
- ☑ What "Level" of responder does the law say I am at a Haz Mat/WMD incident?
- ☑ What are the basic differences in responding to an N, B, C and/or E incident?
- ☑ Where can I go to get additional information on an N, B, C and/or E incident?
- ☑ What "Tools" do I need to safely and competently respond to any WMD incident?
- ☑ **What is my #1 "Role & Goal" as a "FRO" at a WMD/NBC+E incident?**

## *Your **K**ey **R**esponse **I**ssue (**KRI**) for this block is?*

_____

_____

_____

_____

# BLOCK ACTIVITY SHEET

*(INSTRUCTOR MAY SELECT ONE OR MORE OF THE FOLLOWING ACTIVITIES):*

*ACTIVITY A.* As directed by the instructor, form into groups. Then introduce yourselves, name your group (from a "fictitious" terrorist group), and list your "philosophical" cause and objective (which all actions will be based upon). Spokesperson to provide name, philosophical cause and objective to the class.

*ACTIVITY B.* Given a sheet by the instructor, form into teams and discuss your "fictitious" terrorist group's background and purpose/objectives. Be prepared to provide a summary report to the class.

*OTHER ACTIVITY:*

## BLOCK WORK SHEET

- Briefly, in your own words, what is the "**Purpose/Goal**" of the FRO WMD Class:

- The FRO WMD Class is a _____ hour **"S_____"** Class for N_____, B_____, C_____, + E_____ weapons, based on CSTI's Haz Mat _____ Course.

- In your own words, what is the "**Primary Need**" for the FRO WMD Class:

- Per OSHA law, the "**5 Levels**" of responders to Haz Mat incidents are:

- In your own words, what is the definition of a First Responder at the **Operations** level:

- In one word, the "**Mode**" of response for a "**FRO"** is: **D_____.**

- Per CSTI, the FRO "**Role**" at a WMDE event is to: **S_____** and **C_____** Respond, within **L_____ , R _____ , and C_____.**

- Per CSTI, the FRO "**Goals**" are to protect, in order: **L _____/H_____** , **C _____ S_____** , **E _____** , and **P_____**.

# B

## *California Specialized Training Institute*

| | |
|---|---|
| **Block Title:** | Introduction to Terrorism & WMD/NBC+E Weapons |
| **Class:** | Hazardous Materials: FRO–WMD |
| **Block Scope:** | Instructor to cover the following: Define WMD and Terrorism. Describe the current threat of terrorism in the United States, including the use of Nuclear, Biological, Chemical and/or Explosive (NBC+E) weapons on local vulnerabilities via a "Threat Assessment" system. Identify ways to prevent or deter a terrorist event. Identify and describe the general types of NBC+E weapons, and state the hazards each present to first responders. Describe the similarities and differences between a traditional Haz Mat and WMD incident. Identify the "role" and "goals" of the First Responder "Operations" at a WMD incident. Note the need to balance lifesaving activities with evidence preservation. |
| **Block Main Points:** | Block Purpose & Focus<br>U.S. Terrorism in General<br>WMD Use & Bottom Line Question?<br>WMD/NBC+E Types<br>WMD/NBC+E Hazards<br>Haz Mat vs. WMD/NBC+E<br>WMD/NBC+E First Responder<br>Wrap-up, Issues & You |
| **Support Material:** | *See Block Note Sheet/Outline, Data Sheets, Issue Sheet, Activity Sheet and Work Sheet on following pages* |
| **Additional References:** | *See Appendix E (NBC+E Bibliography) for further references as needed* |
| **Time Recommended:** | 60 to 90 Minutes |

Block B

# *Introduction to Terrorism & WMD/NBC+E Weapons*

## Main Points

- Block Purpose & Focus
- U.S. Terrorism in General
- WMD Use & Bottom Line Question?
- WMD/NBC+E Types
- WMD/NBC+E Hazards
- Haz Mat vs. WMD/NBC+E
- The WMD/NBC+E *First Responder*
- Wrap-up, Issues & You

# BLOCK NOTE SHEET/OUTLINE

- **Block Purpose & Focus**
  - ▶ Purpose
  - ▶ Focus

- **U.S. Terrorism in General**
  - ▶ Definitions:
    - ▪ The FBI "Terrorism" Definition
    - ▪ The Title 18 of the US Code "WMD" Definition
    - ▪ The "Terrorism" & "WMD" Definitions for This Class:
      - Terrorism = Any Use of WMD Triggering an Emergency Response
      - WMD = Any Potential Use of NBC+E
  - ▶ Preventing or Deterring Terrorism & WMD
    - ▪ NOTE: "Factors of Threat"
      - Surprise
      - Target of Attack
      - Means/Weapon of Attack
      - Foreknowledge of Response
      - Significant Dates, etc.
    - ▪ NOTE: "Threat Indicators"
      - Planning an Attack
      - Gathering of Target Intelligence
      - Acquisition of Materials for a Weapon of Attack
      - Preparation of Weapons
      - Delivering/Planting the Weapon, etc.

- NOTE: DHS Advisory System Threat Levels:
  - Low = Green
  - Guarded = Blue
  - Elevated = Yellow
  - High = Orange
  - Severe = Red
- To Help Prevent or Deter Terrorism – Observe Suspicious:
  - People or Groups,
  - Vehicles or Buildings,
  - Actions or Objects, etc.

▶ Terrorist Groups & Individuals:

- Racist (e.g. Klu Klux Klan)
- Political (e.g. FALN – Puerto Rican separatist group)
- Religious (e.g. Christian Identity)
- Single Issue (e.g. Animal Liberation Front)
- Others (i.e. Al Qaeda, disgruntled worker, criminal, individual "lone wolf," etc.)
- "Optimistic" vs. "Pessimistic/Apocalyptic" Groups/Individuals & WMD

▶ Targets:

- "Past" Targets: Military, Government Buildings, High Rises, Clinics, etc.
- "People" Targets: Roads, Mass Transit, Malls, Sports Arenas, Schools, etc.
- "Infrastructure" Targets: Water, Gas & Electric, Communications, Banking, etc.
- "Economic" Targets: Industries, Agriculture, Banking & Finance, etc.
- "Other" Targets: Symbols, Dates, Religious Sites, Individuals, Responders, etc.
- "Ideal" WMD Target: High Population + Enclosed Space + "Soft" Target
- "Hard" vs. "Soft" Targets
- NOTE: "Vulnerability Assessment System" Factors
- NOTE: Determine Your Local High Vulnerability Hard & Soft Targets!

- Trends:
  - Pre 9/11/01 – Numbers Down But More Deadly
  - Post 9/11/01 – Numbers & Lethality May Increase
- Weapons:
  - Explosives/Bombs (70%+ weapon of choice)
  - Other Weapons (i.e. NBC?)

- **WMD Use & Bottom Line Question?**
  - WMD Use - Pros & Cons?
    - Pros: Promotes hysteria, more casualties, economic disruption, etc.
    - Cons: Difficult to weaponize, lack expertise, alienates supporters, etc.
  - WMD Use – A Possibility or Probability?
  - Can We Always Prevent or Deter a WMD Attack?
  - Impact if WMD is Used?
  - Bottom Line Question?
    - If/When WMD Agents Are Used . . .
    - Are You Prepared to Respond as a *FRO?*

- **WMD/NBC+E Types**
  - Three (3) Primary "Nuclear" Weapon Types:
    - Source (e.g. Cesium)
    - Radiological Dispersion Device/RDD (e.g. Dirty Bomb)
    - Weapon (e.g. crude Atomic Bomb)
  - Three (3) Primary "Biological" Weapon Types:
    - Bacteria (e.g. Anthrax)
    - Virus (e.g. Smallpox)
    - Toxins (e.g. Ricin)

- Five (5) Primary "Chemical" Weapon Types:
  - Nerve (e.g. GB/Sarin)
  - Blood (e.g. AC/Hydrogen Cyanide)
  - Blister (e.g. H/Mustard)
  - Choking (e.g. Cl/Chlorine)
  - Irritating (e.g. OC/Pepper Spray)
- Three (3) Primary "Explosive" Weapon Types:
  - Commercial Energetic Materials (e.g. Dynamite)
  - Military Ordnance (e.g. Grenades)
  - Improvised "Explosive" Devices/IEDs (e.g. Pipe Bomb)

- **WMD/NBC+E Hazards**
  - "N" (source) + BC" Hazards:
    - Primary: Toxicity!
    - Secondary: Respiratory Distress, Burns, etc.
  - "N" (bomb or RDD) + "E" Hazards:
    - Primary: Blast Wave + Fragmentation + Thermal!
    - Secondary: Fires, Cuts, Toxicity, etc.
  - "NBC+E" Dispersion Methods
    - High Explosion
    - Low Yield Explosive Devices
    - Vectors
    - Ground, Food or Water Contamination
    - Letters & Packages
    - Cars, Vans & Trucks
    - Suicide/Homicide Bombers
    - Aerosolizing/Spraying Device, etc.

- "N" (source) + BC" Routes of Exposure:
  - Primary: Inhalation
  - Other: Absorption, Ingestion & Injection
- "N" (bomb or RDD) + "E" Routes of Exposure:
  - Primary: Injection (Stress beyond Elastic Limit, Blunt Trauma, Burns, etc.)
  - Other: Toxicity via Inhalation, Absorption, etc.
- "NBC+E" Protection from Hazards & Exposure - Proper PPE or Safe Distance!
- NOTE: Know Your Specific NBC+E Threats & Hazards!

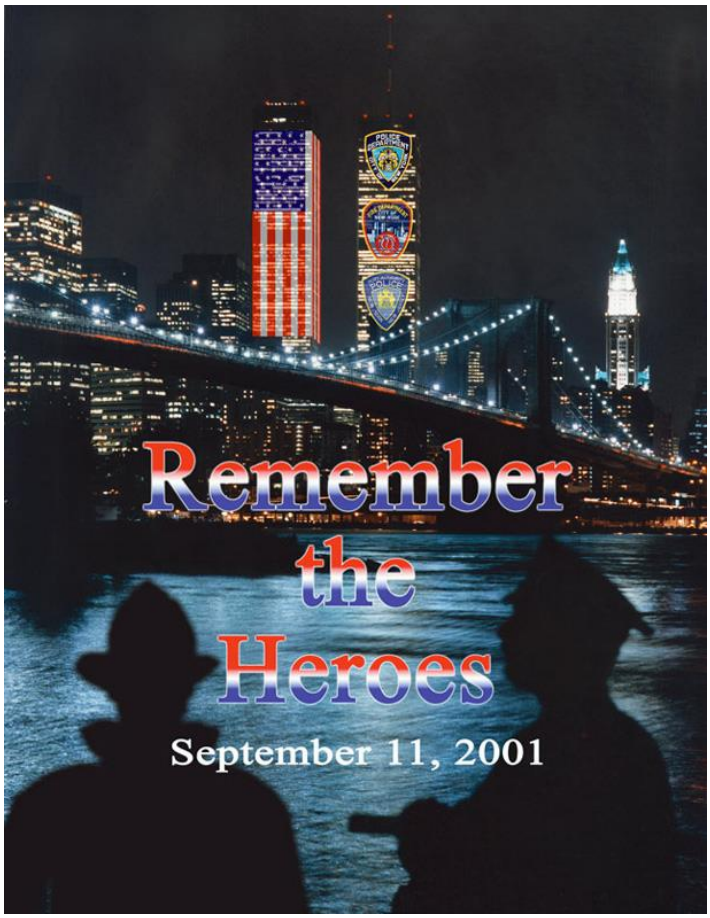
## • Haz Mat vs. WMD/NBC+E

- OSHA Considers WMD/NBC+E to be "Haz Mat," falling within "HAZWOPER (q)"
- Haz Mat "Similar" to WMD/NBC+E: Same Control Zone, PPE & Decon Issues, etc.
- WMD/NBC+E "Differences" from Haz Mat =
  - NBC+E: Deliberate Act Designed to Kill (may cause mass casualties)
  - NBC+E: Major Federal Crime Scene (NOTE: Life Safety vs. Crime Scene)
  - NBC: Difficult to Recognize (especially Bio Agents)
  - NBC: Highly Toxic (and sometimes persistent)
  - All "NBC+E" Will Produce Mass Attention, Media, Chaos, etc.

## • The WMD/NBC+E First Responder

- In WMD – Will Initially Respond to a "Chaotic" Scene:
  - Difficult to Recognize – Limited & Conflicting Info
  - First Responders May Become Part of the Problem
- WMD Requires Quick *FRO* Self Protection, Isolation & Notifications, etc.
- Bottom Line: WMD "First Responders" Must Be Able To:
  - Safely & Competently Respond, within *FRO* Level, Resources & Capabilities
  - In Order to Better Protect: Life/Health, Crime Scene, Environment & Property

- **Wrap-up, Issues & You**
  - Block Key Point Summary
  - Block Key *Response* Issues:
  - Your Issues/Questions?

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***"Don't assume away the capabilities of the enemy."***
*(Joint Chiefs of Staff Publication #1)*

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## **BLOCK DATA SHEETS** – *Terrorism & WMD Definitions*

*FBI Definition Of Terrorism:* The FBI definition of Terrorism has four (4) key elements:

1. The unlawful use of force or violence
2. Against persons or property to
3. Intimidate or coerce a government, the civilian population, or any segment thereof,
4. In furtherance of political or social objectives.

*DHS Definition of Terrorism:* Terrorism is defined under the Homeland Security Act of 2002, Public Law 107-295, 116 Statute 2135 (2002) as:

- Activities that involve an act dangerous to human life
- Or potential destruction of critical infrastructure or any key resource
- And that is a violation of the criminal laws of the United States, or any state or other subdivision of the United States in which it occurs
- And is intended to intimidate or coerce the civilian population
- Or influence a government
- Or affect a government by mass destruction, assassination, or kidnapping

*Title 18 WMD Definition:* Weapons of Mass Destruction (WMD) are defined in Title 18, U.S.C. 2332a:

- Any explosive, incendiary, or poison gas, bomb, grenade, rocket having a propellant charge of more than four ounces, or missile having an explosive or incendiary charge of more than one-quarter ounce, or mine or similar device
- Any weapon that is designed or intended to cause death or serious bodily injury through the release, dissemination, or impact of toxic or poisonous chemical or their precursors
- Any weapon involving a disease organism
- Any weapon that is designed to release radiation or radioactivity at a level dangerous to human life

## **BLOCK DATA SHEETS** – *Preventing & Deterring Terrorism*

*Factors of Threat:*

The term "Threat" usually refers to the terrorist's ability to do harm. The threat of an "Apocalyptic" terrorist attack has increased due to many factors. Currently, many terrorist groups have decentralized into ad hoc organizations—making them harder to target and eliminate. Additionally, the new terrorist organizations have greater access to WMD materials and the technical expertise to weaponize them. Modern terrorists have military-style training and goals of creating mass casualties, not only by using a WMD, but also by manipulating other threat factors in order to make an attack more effective and/or lethal, including:

- *Surprise*—Relative to time of attack. The element of surprise in a terrorist attack allows more reward to the terrorist. Few people have prior knowledge of the attack plans; even fewer people have knowledge of the dates and times when the attack will be executed. The shock value gained by the swiftness and suddenness of the attack bolsters the terrorist's image

- *Target of the attack*—Targets can be people targeted for assassination, places where large groups of people congregate, places of economic or financial significance, critical infrastructures, and/or targets of symbolic value (the Statue of Liberty, the White House, the Golden Gate Bridge, etc.). The main goal is mass casualties

- *Means/Weapon of attack*—Limited only by the terrorist's imagination. The attack can range from releasing a chemical WMD, biological WMD, radiological WMD, or an improvised explosive device. According to federal authorities, the most likely scenario is an improvised explosive device

- *Foreknowledge of the community response*—Terrorists will almost always conduct extensive surveillance, especially of exercises involving weapons of mass destruction. Terrorists will understand a community's capability to respond to any mass casualty incident through their surveillance of the community's responder resources, and they will plan accordingly

- *Significant dates*—Attacks have been related to other significant dates: the Alfred P. Murrah Federal Building on the anniversary of the Waco, Texas fire April 19th; the attacks of September 11th and the train attack in Madrid, Spain, March 11th

Understanding these factors may help us to prevent or deter an attack. Also, a community's ability to analyze and assess the terrorist WMD threat, and its vulnerability to that threat, is the first step in developing a contingency plan. Every community should have an emergency response plan to minimize the catastrophic impact of a terrorist WMD attack by addressing the complexities of such an attack. Responders should understand and be able to execute the plan.

## BLOCK DATA SHEETS – *Preventing & Deterring Terrorism (cont.)*

*Threat Indicators* Threat "Indicators" are observed behaviors, activities and/or items construed as terrorist planning efforts of an impending attack (this assumes a terrorist group has formed with a purpose to kill people and has gained the necessary funding). These, and the threat indicators listed below, represent opportunities to prevent or deter the terrorist attack:

- *Gathering of target intelligence*—Process of intelligence gathering precedes all terrorist operations. This often involves conducting reconnaissance visits or stationary surveillance of a target for weeks or even months. For example, an individual videotaping the outside of a water treatment plant or someone who sits at a bus stop and takes notes, but never boards a bus

- *Acquisition of materials necessary for an attack*—Responders and citizens should be aware of materials, supplies, and assets in their community that may have value to terrorist's applications. Many items used to construct and transport weapons of mass destruction are available in all communities. For example, persons buying large quantities of nitrogen-based fertilizer or someone purchasing pipe along with caps for each end of pipe

- *Preparation of weapons*—Citizens should be aware of threat indicators related to the preparation and delivery of terrorist weapons. For example, strong chemical smells coming from apartments or residences or large drums of materials being moved into or out of a residence or storage facility

- *First steps of executing an attack* (delivering the weapon, gaining access, planting the weapon, etc.)—Responsible persons should be aware of unusual activities around potential targets. For instance, individuals attempting to gain access to restricted areas, or vans or trucks left unattended in close proximity to a potential target

By surveillance, law enforcement can identify the terrorists (i.e. monitor recruitment flyers, meetings, rallies, web sites, etc.), remove financial support (i.e. monitor identify theft, charity scams, robberies, etc.), discover plans, and monitor probable targets and substances used in weapons, all of which at any step may lead to preventing or deterring the attack. Hardening of targets, increases of security and counter surveillance are other actions that can thwart the terrorist groups or individuals. Good intelligence and sharing of information, such as the CATIC, is an essential "Anti-Terrorism" tool. Establishing national standard threat levels is an attempt at encouraging all Americans to be extra vigilant while going about their daily activities. The "Threat Levels" are as follows:

- Low (Green) > Guarded (Blue) > Elevated (Yellow) > High (Orange) > Severe (Red)

At the very least we should be observant of suspicious individuals, groups, vehicles, occupancies, objects and actions. Is something suspicious/does not look right? Then we need to immediately report it to the appropriate law enforcement agency for investigation.

## BLOCK DATA SHEETS – *Preventing & Deterring Terrorism (cont.)*

**Suspicious Individuals & Groups:**

- In vehicles, or using other means of conveyance, arriving and departing locations at odd times of the day or night
- Suspiciously exiting a secured, non-public area near a train or a bus depot, airport, tunnel, bridge, government building, or tourist attraction
- Who stay at bus or train stops for extended periods while buses and trains come and go
- Who don't fit into the surrounding environment because they are wearing improper attire for the location or season
- Who exhibit suspicious behavior, such as staring or quickly looking away from individuals or vehicles as they enter or leave facilities or parking areas

**Suspicious Vehicles & Occupancies:**

- Vehicles left unattended or abandoned, or that appear to be "out of place"
- Buildings that appear to be illicit labs have strange odors, have strange occupants, etc.
- Any vehicle suspected of doing mobile surveillance, such as automobiles carrying camera equipment, or vans with tinted windows near potential targets
- Vehicles with removable decals, or signage that has been painted over or altered
- Altered frames, such as cutouts in the body of the vehicle

**Suspicious Actions & Objects:**

- Suspicious packages, parcels, luggage, or mail abandoned or left unattended in a crowded place such as an office building, airport, school or shopping center
- Chemical fires, toxic odors, or colored stains in apartments, motel rooms, or self-storage units
- Unusual test explosions in rural or wooded areas
- Purchase of, or illicit access to, facility blueprints
- Heavy mailed packages with excessive postage
- Questioning of security or facility personnel
- Any unusual activity or circumstance in your neighborhood, community, or workplace, etc.

## **BLOCK DATA SHEETS** – *Soft & Hard "Targets" List*

A WMD target designed to kill many people would likely include a location where there were large amounts of people, preferably in an enclosed location (to minimize variables like weather), and would be an easy/soft target to attack. But there are many other soft targets that would provide easy/soft locations to attack, still kill people, cause a large negative economic impact, and/or cause a large amount of chaos/fear. Targets may also include a symbol (Statue of Liberty), a date (April 19) or responders themselves (as in the Atlanta bombing). Still other targets are considered hard/difficult to successfully attack, but never the less, may still be a target. Many of the following targets* have been attacked within the US in the past, but most represent "potential" soft and hard targets to consider (check-off and add targets to this list):

SOFT TARGETS

__ Government Buildings*
__ High Rise Buildings*
__ Churches*
__ Clinics*
__ Restaurants*
__ Theaters
__ Malls
__ Hospitals
__ Schools*
__ Sports arenas
__ Night clubs*
__ Major highways/roads
__ Mass transit systems*
__ Ports
__ Industry
__ Agriculture
__ Cyber
__ Symbols
__ Dates*
__ Specific Individuals*
__ Responders*
__ Other:

HARD TARGETS

__ Military facilities & equipment*
__ Nuclear power plants
__ High security research facilities
__ Airports*
__ Other:

## **BLOCK DATA SHEETS** – *"Infrastructure" Targets*

Another critical target to is your community's "Infrastructure." Here are some specific infrastructure targets to consider:

- *Telecommunications:* Networks and systems that support the transmission and exchange of electronic communications among and between end-users (such as networked computers)

- *Electrical Power:* Generation stations, transmission, and distribution networks that create and supply electricity to end-users ensuring end-users achieve and maintain nominal functionality, including the transportation and storage of fuel essential to that system

- *Gas and Oil Production, Storage, and Delivery:* Holding facilities for natural gas; crude; refined petroleum; petroleum-derived fuels; the refining and processing facilities for these fuels; and the pipelines, ships, trucks, and rail systems that transport these commodities from their source to systems dependent upon gas and oil in one of their useful forms

- *Banking and Finance:* Retail and commercial organizations; investment institutions; exchange boards; trading houses; reserve systems; and associated operational organizations, government operations, and support entities involved in all manner of monetary transactions—including its storage for saving purposes, investment for income purposes, exchange for payment purposes, and disbursement in the form of loans and other financial instruments

- *Transportation Systems:* Aviation, rail, highway, and aquatic vehicles, conduits, and support systems by which people and goods are moved from a point-of-origin to a destination point in order to support and complete matters of commerce, government operations, and personal affairs

- *Water Supply Systems:* Sources of water, reservoirs and holding facilities, aqueducts and other transport systems, the filtration and cleaning systems, the pipelines, the cooling systems, and other delivery mechanisms that provide for domestic and industrial applications—including systems for dealing with wastewater and firefighting

- *Food & Agriculture*: Nearly 2 million farms in the U.S. (87,000 in CA). Exports exceed 50 billion annually (over 27 billion annually in CA). Targets may include field crops, farm animals, foods in the processing or distribution chain, market ready foods, etc.

- *Emergency Services*: Medical, police, fire and rescue systems, and personnel called upon when an individual or community is responding to a public health or safety incident where speed and efficiency are necessary

- *Government Operations*: Operations and services of governments at federal, state, and local levels critical to the functioning of the nation's systems (i.e., public health, safety and welfare, schools, agriculture, postal service, defense, etc.)

## **BLOCK DATA SHEETS** – *Targets & A "Vulnerability Assessment System"*

With so many targets, how can you determine the high priority targets that are the most vulnerable in your area? Here is a sample "Vulnerability Assessment System" to consider. It contains seven (7) "Factors" to determine the most vulnerable targets, as follows:

- *Visibility:* Addresses the awareness of the existence and visibility of the target
- *Criticality:* Usefulness of target site to population, economy, government, etc., Deemed critical to the continuity of basic jurisdiction infrastructure
- *Value:* Value of the target to serve the ends/purpose of the terrorist
- *Access:* Evaluates access to the target by the terrorist
- *Threat of Hazard:* Assesses the presence of Haz Mat within the target in quantities that would overwhelm response capabilities if released
- *Population:* Maximum number of individuals at the target site at any given time
- *Collateral Damage:* Potential mass casualties within one mile radius of the target site.

After selecting a potential target, it is assessed in each of the seven factors above. Each factor is rated as "No Threat" to a "Very High Threat" using the following general scale (*Note: As in NFPA 704 System, numbers mean specific things, which are NOT reflected in this general scale below*):

- **0** No Threat
- **1** Very Low Threat
- **2** Low Threat
- **3** Medium Threat
- **4** High Threat
- **5** Very High Threat

Targets with the highest number of points represent the highest vulnerability. This system (as well as other systems like "CARVER") helps you assess and prioritize the vulnerable targets within your community. You are encouraged to use one of these systems to identify your "High Priority" vulnerable targets. ***Once high priority targets are identified, think about the impact in and around the target area, the resources that would be needed, and the most effective way to safely and competently initially respond to the target! At the very least, don't forget to do a vulnerability assessment of your facility – Are you a "Soft" or "Hard" target?***

## **BLOCK DATA SHEETS** – *About Terrorism*

*Terrorism & WMD Definitions:* There are many definitions of terrorism. The word comes from Latin origins meaning, to frighten. See specific definitions on page 8. For this class we define terrorism as any group or individual that uses WMD (defined as any Nuclear, Biological, Chemical or Explosive Weapon) causing an emergency response.

*Terrorist Groups:* There are many groups with differing "Purposes/Objectives" and motives. It is important to note that most terrorist groups want to achieve their objectives, without killing people, which may negatively affect their funding, recruitment, safe haven, etc. "Apocalyptic" groups (i.e. extreme religious, political, racist or single issue groups) are the exception, in that they will kill lots of people to achieve their ultimate purpose/objective. Some groups may be "State Sponsored" which may increase their chances of successful WMD attack. We need to try and prevent an attack, but if/when it happens, we need to be ready to safely and competently respond to the target.

*Targets:* There are many targets, depending upon the terrorist group. A racist or religious group may attack a church or synagogue. A single issue group might attack a clinic. A political group may attack a government building. A date (e.g. April 19) may be a target for an attack. If a group wanted to kill a large number of people, an enclosed building holding many people (i.e. a theater, arena, mall, etc.) may be a likely "soft" target. Bombing common "Haz Mats" in storage or shipment may be another likely "soft" target. In short, any U.S. community with roads, buildings, infrastructure, people, etc., could be a target. Responders have been the targets of an attack! There are "hard" and "soft" targets! It is important to survey your local area for high vulnerability "hard" and "soft" targets. A "Threat Assessment" program may be used to help rank/prioritize your jurisdiction's most vulnerable targets (see page 14)!

*Trends:* Before 9/11/01, terrorist incidents were going down but were showing signs of more lethality. Post 9/11/01 has created a greater concern for terrorists using WMD within our country. Today, the perceived WMD threat is real to the public we serve.

*Weapons:* When weapons are used, over 70% of the weapons are "Explosives/Bombs" (per FBI). Usually, if terrorists use weapons, they use weapons that are available, simple and reliable. Today, use of "NBC" agents are now an added concern.

*Key Question:* Whether a future NBC+E attack is possible or probable is not the key question. The most important "Bottom Line" question for you: If/When a NBC+E incident occurs, are you prepared to respond safely and competently at the "FRO" level?

## **BLOCK DATA SHEETS** – *About "N" – Some Nontechnical/Basic Info*:*

*N Defined:* There are many definitions for the term "Nuclear." In the Haz Mat world, we think of it as something that spontaneously emits "Ionizing Radiation." Ionizing radiation is produced by unstable atoms. In order to reach stability, these atoms give off/emit the excess energy or mass in the form of "Particulate" radiation (Alpha, Beta and Neutron) and/or "Electromagnetic" radiation (Gamma and X rays). There is "Background' or natural radiation around us every day (about 1 milliREM per day). But say the word "Radiation" and watch the public go "Nuclear"! There is a high level of fear associated with these words, and the perception of the nuclear threat often exceeds the reality. The biggest concern of a "Dirty Bomb" is the blast, cost of cleanup and the irrational fear it can induce. Perhaps the most effective tool in fighting terrorism is "Knowledge."

*N Terms:*
**Curie (Ci):** Conventional unit of measure to describe the amount of radioactivity.
**Becquerel (Bq):** New international unit of measure for the amount of radioactivity.
**Roentgen (R):** Used to measure the dose or exposure of radiation in the air.
**Radiation Absorbed Dose (RAD):** Unit for absorbed radiation dose (Gray = 100 RAD).
**Roentgen Equivalent Man (REM):** Unit of measure that describes a dose of radiation by factoring in the "Biological Effects" of the different types of radiation.
**Milli Roentgen Equivalent Man (milliREM):** $1/1000^{th}$ of a REM.
**Sievert (Sv):** Another measure of radiation (1 Sievert = 100 REM).
**Fission:** The "Splitting" of the atom (as in the "A" bomb).
**Fusion:** The "Fusing" of atoms together (as in the "H" bomb).

*N Types:*
**Source:** (i.e. Cesium, Cobalt, Radium, Iodine, Uranium, Americum, Tetrafluoride, etc.)
**RDD:** (Radiological Dispersion Device [e.g. "Dirty Bomb" w/ rad source like Cesium])
**Weapon:** (i.e. crude Atomic Bomb [e.g. Plutonium or other Alpha emitter], etc.)
***Other?:*** *A "Threat" of a nuclear problem (i.e. Nuclear Power Plant, Hoax, etc.)!*

*N Hazards:* Blast, heat, toxicity, etc. – Which may cause illness, injury and/or death!

*N Factoids:*
Average background/natural radiation is 1 milliRem per day.
An average chest X ray emits about 10-15 milliREM.
Up to 50 REM will produce no obvious effect, except possible minor blood changes.
Radiation may produce delayed reactions/effects (i.e. cell mutation, cancer, etc.).
Inhalation is the primary route of entry for a particulate source of radiation.
External radiation does not make a person radioactive.
A "RDD" is not a fission or fusion "Nuclear Bomb/Weapon."
A "RDD" uses a "Conventional Bomb/Explosive" to spread radioactive material.
Doubling your distance from a radiation "Source" decreases exposure by four times.
***For detailed technical info see: APPENDIX E – NBC+E BIBLIOGRAPHY!**

**BLOCK DATA SHEETS** – *Losses of Nuclear Weapons from USAF aircraft accidents:*

| Date | Location | Cause | Result |
|---|---|---|---|
| 4/11/50 | NM | crash | Weapon(s) destroyed in crash and resulting fire. |
| 8/5/50 | CA | crash | Weapon(s) destroyed in crash and resulting fire. |
| 7/13/50 | unknown | crash | Weapon(s) destroyed in crash and resulting fire. |
| 2/10/50 | unknown | crash | Weapon(s) destroyed in crash and resulting fire. |
| 2/13/50 | unknown | intentional jettison | Weapon(s) destroyed. |
| 3/10/56 | unknown | intentional jettison | Weapon(s) lost at sea. **Not found.** |
| 7/27/56 | unknown | crash on takeoff | Weapon(s) damaged and recovered. |
| 5/22/57 | NM | accidental jettison | Weapon(s) destroyed. |
| 10/11/57 | unknown | crash on takeoff | Weapon(s) damaged and recovered. |
| 1/31/58 | unknown | crash on takeoff | Weapon(s) destroyed in crash and resulting fire. |
| 2/5/58 | GA | collision and crash | Weapon(s) lost at sea. **Not found.** |
| 3/11/58 | GA | accidental jettison | Weapon(s) destroyed. |
| 11/4/58 | unknown | crash on takeoff | Weapon(s) destroyed. |
| 11/26/58 | unknown | fire on ground | Weapon(s) destroyed. |
| 10/15/58 | KY | collision and crash | Weapon(s) damaged and recovered. |
| 1/24/61 | NC | crash | 2 weapons lost. 1 recovered and 1 landed in quicksand and **never found.** |
| 3/14/61 | CA | crash | Weapon(s) damaged and recovered. |
| 1/13/64 | MD | crash | Weapon(s) damaged and recovered. |
| 12/8/64 | unknown | crash on takeoff | Weapon(s) destroyed in crash and resulting fire. |
| 1/17/66 | Spain | collision and crash | 4 weapons lost. 3 recovered immediately. 1 later recovered at sea by a submarine. |
| 1/21/68 | Greenland | crash on landing | Weapon(s) destroyed in crash and resulting fire (Note: After this, the Secretary of Defense severely restricted authority of military aircraft to carry armed nuclear weapons. No further aircraft accidents involving nuclear weapons known since that decision). |

**"Suitcase Nukes" (from "The Unthinkable" by Susan Freinkel)**

"While a 'suitcase' nuclear bomb may have fallen into the wrong hands, these temperamental devices need periodic maintenance by skilled technicians to remain operational. Terrorists are unlikely to possess the expertise required."

## **BLOCK DATA SHEETS** – *Radiation Exposure vs. Contamination:*

*External Exposure*—The radiation, but not the radioactive material, reaches the person. The source of radiation (radioactive material) is not on the person and not inside the person, therefore, the person is not contaminated. This person is *NOT radioactive.* This person does not emit radiation and cannot be a hazard to him/herself or anybody else around, including medical personnel. External exposures are either local (such as the hands) or total body. Receiving a dose (exposure) of radiation energy is somewhat like receiving a dose of solar ultraviolet (UV) energy from the sun. The solar energy results in a sunburn, but the person receiving the sunburn is not contaminated by the sun, does not emit UV energy, and does not cause other persons to receive a sunburn. Receiving a small dose of radiation is a very low risk to victims and responders. Receiving a massive dose of radiation (especially over an extended period of time) constitutes a significant risk to the victims and responders.

*External Contamination*—An externally *contaminated* person has radiological material physically attached to his or her skin and/or hair. Everyone and everything near the release of radioactive material must be treated as potentially externally contaminated. This includes victims, responders, equipment, papers, and evidence. Externally contaminated victims rarely have enough radioactive material on their bodies to create radiation levels dangerous to responders. An externally contaminated person is receiving an external exposure of radiation as long as the radioactive material remains on the individual.

*Internal Contamination and Internal Exposure*—Occurs when unprotected people ingest, inhale, or are wounded by radioactive material. Open wounds can be a pathway for internal contamination. Internally contaminated victims present a minimal risk to responders. The internally contaminated victim may also be externally contaminated. The skin, mouth, and nose are the most obvious routes to internal contamination. Internally contaminated persons also receive an internal exposure. In general, internal contamination is more dangerous *to the victim* than external contamination.

Radioactive material can enter the body by four methods:

*Inhalation*—Gaseous or airborne particles, dust particulates, and matter with radioactive material may enter the body through the lungs

*Ingestion*—Internal radioactive contamination may enter the body through the gastrointestinal tract by way of contaminated food, drink, and swallowing contaminated mucous from the nasal area

*Absorption*—Radioactive material may be absorbed through the skin or mucous membranes

*Injection*—Radioactive material can penetrate the body through cuts, wounds, and punctures in the skin

## BLOCK DATA SHEETS – *About "B" – Some Nontechnical/Basic Info*:*

*B Defined:* One definition of "Biological" in the dictionary states: "Pertaining to Biology." Biology is the science of life or living matter in all its forms and phenomena. In the Haz Mat world, we focus on the little critters/organisms that we can't see, which can cause disease and death. "Bio" agents include Bacteria, Virus and Toxins. Bacteria are single celled microorganisms, and can be either spherical (cocci) or rod shaped (bacilli) when viewed with a microscope (e.g. Anthrax). Virus are smaller than Bacteria and live on or within other cells (e.g. Smallpox). Biological Toxins are nonliving toxic substances originating from animals, plants and microbes and are more toxic than chemicals used in industry today (e.g. Ricin). Most Biological agents have latent incubation periods of days to weeks before symptoms of illness begin to show, except some Toxins (e.g. T2 Mycotoxin) that may show up in minutes to hours. Some Bio agents are contagious and some are not. Some have antidotes and some do not. Biological agents are frightening at first glance, but the way to not overreact is to study the subject thoroughly.

*B Terms:*
**Etiology:** The study of the causes of disease.
**Pathogen:** Disease producing organism.
**Rickettsia:** A Bacteria like organism causing illness but rarely death (e.g. Q Fever).
**"Weaponized" Anthrax:** To be effectively dispersed, Anthrax must be weaponized (milled to 1-5 microns, polished, coated with Bentonite, given a positive charge, etc.).
**Cutaneous:** Affecting the skin – To take in by touch and an open wound.
**Inhalation:** Affecting the lungs/respiratory system - To draw in by breathing.
**Incubation Period:** Period between infection and signs of a disease.
**Contagion:** The communication/spreading of disease by direct or indirect contact.
**Vectors:** An insect or other "Host" organism that transmits a virus.

*B Types:*
**Bacteria** (i.e. Anthrax, Cholera, Plague [Bubonic & Pneumonic], Tularemia, etc.)
**Virus** (i.e. Smallpox, Encephalitis, Viral Hemorrhagic Fevers, etc.)
**Toxin** (i.e. Ricin, Botulinum, Staphylococcal Enterotoxin B [SEB], T2 Mycotoxin, etc.)
***Other?:*** *Rickettsia (Q Fever), Fungi, Molds, Yeasts, etc.*

*B Hazards:* Inhale, ingest, touch w/ open wound, etc. – Which may later cause illness and/or death!

*B Factoids:*
Most biological agents produce latent symptoms/delayed reactions (in days).
An exception to the above would be SEB or T2 Mycotoxin (in hours or minutes).
Bio agents will probably be detected by a "Health" agency – Not first responders.
An exception to the above is when there is a "Valid Threat" or "Hoax" response.
Inhalation is the primary route of entry (that often can be protected by a HEPA mask).
Open cuts on the skin may be another route of entry (e.g. "Cutaneous" Anthrax).
Confirmation of a Bio agent may take lab support and over 24 hours to confirm.
***For detailed technical info see: APPENDIX E – NBC+E BIBLIOGRAPHY!**

## **BLOCK DATA SHEETS** - *Biological Agents & The CDC*

*CDC* The Center for Disease Control (CDC) manages the public health surveillance system in the United States. The Division of Public Health Surveillance and Informatics in the Epidemiology Program Office in CDC collects, analyzes and interprets data from a variety of sources to determine the agent involved and the risk of public health exposure.

*Purpose* CDC seeks to estimate the magnitude of the problem, determine the geographic distribution of any illness and evaluate control measures. If there is no prior warning of attack involving biological agents, the first indication of a problem would likely be a sudden increased number of patients with similar signs and symptoms. CDC would begin an epidemiologic investigation of the outbreak, assist in identifying the pathogen and assist in disseminating information on medical treatment. This ability to quickly collect and evaluate information on a sudden epidemic is vital in our ability to identify the agent involved, plan an appropriate public health response and provide information to the public, government agencies and the media.

*Sources of Info* Epidemiologists use a variety of data sources to detect a potential epidemic. The sources include reports of notifiable diseases, review of vital records, analysis of lab specimens and surveys. In addition, they have systems in place to provide expedited notice of problems.

*Diseases* There are currently 52 diseases that require notification upon diagnosis. These include many of the diseases that could be attributed to biological weapons (e.g. anthrax, botulism and plague). Each state has different procedures for notification. Most require medical practitioners to notify local health departments who then notify the state. The states send the data to CDC once a week.

*Mortality* CDC receives weekly mortality reports from 122 cities and metropolitan areas in the United States within 2–3 weeks from the date of death. These reports summarize the total number of deaths occurring in these cities/areas each week, as well as the number due to pneumonia and influenza. This system consistently covers approximately one-third of the deaths in the United States and provides CDC epidemiologists with preliminary information with which to evaluate the impact of influenza on mortality in the United States and the severity of the currently circulating virus strains.

## **BLOCK DATA SHEETS** - *Biological Agents & The CDC (cont.)*

*Immediate* Some CDC systems allow for immediate reporting of suspicious occurrences. CDC receives immediate notification of episodes of botulism since it is the only source of the botulism antitoxin. Many laboratories or medical facilities will immediately report unusual outbreaks of diseases or unusual medical conditions. Often, these reports come from physicians who have completed the Epidemic Intelligence Service (EIS) program, a 2-year, post-graduate program of service and on-the-job training in epidemiology.

*Procedures* The CDC will take the following steps in investigating an outbreak: formulate a definition of a case to determine the number of people affected, determine the patterns (if any) of the cases, then attempt to identify the agent involved.

The first step is critical to ensure the public health system can verify that an attack has indeed occurred. In an incident involving biological agents, there is the strong possibility that the mere threat of an attack can generate mass psychosomatic responses. The public health system needs some objective criteria to identify actual cases and determine if the number of cases is higher than the normal rate expected.

The second step will help to determine whether or not this is a naturally occurring outbreak or the result of an intentional act. Naturally occurring epidemics follow patterns regarding the timing of the outbreak, the spread of the pathogen throughout a population and the individuals affected. An outbreak from an intentional release will exhibit different patterns. The disease incidence will increase much more rapidly than in a natural outbreak and the first group of people affected would have some common denominator that may not appear in a normal epidemic.

*Complications* The ability to detect a biological agent attack will be difficult for several reasons. The signs and symptoms of infection for many of these agents are nonspecific and often resemble those of more common infectious diseases. The incubation period of these diseases will often ensure that the people initially exposed may be geographically dispersed when they become ill. Many of these diseases have widely variable incubation periods so the onset of the epidemic may not be immediately obvious. If the release is not widespread, and few people are affected, the outbreak may go unnoticed as affected individuals seek medical care from a variety of sources and locations.

## **BLOCK DATA SHEETS** – *More About Anthrax:*

### What is anthrax?

It is a bacterial disease that can infect all warm-blooded animals, including humans. It forms resilient microscopic spores (one million spores can fit on the head of a pin). Past studies indicate an LD 50 of 8,000-10,000 spores (recent studies after 9/11 suggest much less spores are needed). Humans can be infected primarily by "Inhalation" (aerosolized @ 1-5 microns) or "Cutaneous" (skin) anthrax.

### Who gets anthrax?

Anthrax is primarily an occupational disease. It is occasionally identified in individuals exposed to dead animals and animal products such as wool and hair.

### How is anthrax spread?

The anthrax bacteria can live in the soil for many years. Humans may become infected with anthrax by inhaling contaminated soil particles or by handling wool or hair from diseased animals. Infection of the intestinal tract can occur by eating undercooked meat from diseased animals.

### What are the symptoms of anthrax?

The symptoms vary depending upon the type of exposure. With skin exposure, a boil-like lesion appears which eventually forms a black center. A swelling of the lymph gland under the arm may occur. With respiratory exposure, symptoms may resemble the common cold and may progress to severe breathing problems and even death.

### How soon after infection do symptoms appear?

The incubation period is usually within seven days.

### When, and for how long, is a person able to spread anthrax?

There are no reports of the disease spreading from human to human.

### Does past infection with anthrax make a person immune?

A second attack with this disease is unlikely.

### What is the treatment for anthrax?

Penicillin is the drug of choice. Tetracycline may also be prescribed.

### What can be the effect of not being treated for anthrax?

The disease could be **fatal** in untreated cases.

*Note: Although Anthrax has been used as a weapon in the fall of 2001, it is an enormous technical leap from mailing small quantities to producing the pounds necessary (as well as a successful dispersion method) for a successful large scale attack. As of 12/01, all but five (5) of the entire twenty-two (22) cases of the "Fall" Anthrax attacks survived.*

## **BLOCK DATA SHEETS** – About "C" – Some Nontechnical/Basic Info*:

*C Defined:* Chemistry has existed for thousands of years, and the properties of chemicals have not changed. All chemicals are based on chemistry. A definition of "Chemistry" is: "The science that deals with or investigates the composition, properties and transformations of substances and various elementary forms of matter." In the Haz Mat world, we focus on chemicals manufactured, transported, used and stored in our everyday life. Most of our Haz Mat spills deal with petro-chemicals. However, since World War I, the military has used chemicals as agents of warfare to incapacitate or kill the enemy. As well as an "Inhalation" hazard, many chemical agents can be absorbed through the skin, which is why chemical agents require the highest level of Personal Protective Equipment. Many chemical agents require "Immediate" decontamination. All WMD chemical agents, with the possible exception of "Irritating" agents (e.g. Pepper Spray), can kill many people!

*C Terms:*
**States of Matter:** Solid, liquid/vapor or gas (note: Nerve agents are liquids – not gas)
**Boiling Point:** Temperature where a liquid will vaporize – Low BP = High Hazard.
**Vapor Pressure:** Ability of a material to produce vapor – High VP = High Hazard.
**Vapor Density:** Relationship of a material to air – Will it hang low or rise?
**Solubility:** Determination if the material will mix or dissolve in water – Swimmer?
**Specific Gravity:** Relationship of a nonsoluble material to water – Will it sink or float?
**Volatility:** Ability to evaporate - Many Cs are thickened so as not to evaporate quickly.
**Persistency:** Time a material sticks around (per military - persistent if over 24 hours)
**Flammable Range:** Mixture of material/vapor and air that will support combustion.
**TLV-C:** Tox term "Threshold Limit Value–Ceiling" (do not exceed without ill effects).
**IDLH:** Tox term "Immediately Dangerous to Life & Health" (need PPE or get out)!

*C Types:*
**Nerve** (i.e. GA/Tabun, GB/Sarin, GD/Soman, VX, etc.)
**Blood** (i.e. AC/Hydrogen Cyanide, CK/Cyanogen Chloride, Arsine, etc.)
**Blister** (i.e. H/Mustard, HD/Distilled Mustard, L/Lewisite, CX/Phosgene Oximine, etc.)
**Choking** (i.e. Cl/Chlorine, CG/Phosgene, Diphosgene, etc.)
**Irritating** (i.e. CN/Mace, OC/Pepper Spray, CS/Tear Gas, DM/Vomiting Gas, etc.)
***Other?:*** *Many common industrial chemicals (Chlorine, Ammonia, Acids, LPG, etc.)*

*C Hazards:* Inhale, absorb, ingest, inject, etc. – Which may cause illness, injury and/or death!

*C Factoids:* Most chemical agents produce immediate similar symptoms (without obvious trama).
An exception to the above would be Mustard agents, Phosgene, etc.
Chemical agents can be both toxic inhalation and absorption hazards.
Responders in or near the hazard area should have highest level of PPE!
If any potential for inhalation hazard and not wearing an SCBA - Get to safe distance!
***For detailed technical info see: APPENDIX E – NBC+E BIBLIOGRAPHY!**

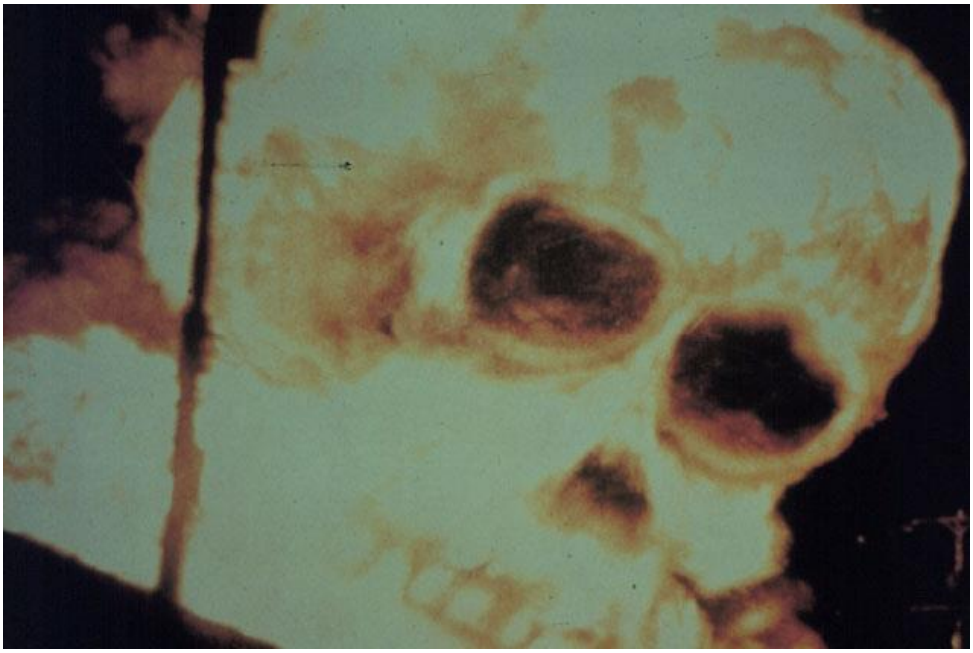
## **BLOCK DATA SHEETS** – *Chemical Agent Lethality*

The following information is a representation of the approximate lethality of the agents in relation to "Chlorine" (which has an "Immediately Dangerous to Life & Health/IDLH" number of approximately 10 parts per million). If Chlorine is used as a baseline, then:

1. Cyanogen chloride is twice as toxic
2. Phosgene is six times more toxic
3. Hydrogen cyanide is seven times more toxic
4. Mustard is 13 times more toxic
5. Sarin is 200 times more toxic
6. VX is 600 times more toxic

For skin toxicity, one to two grams of mustard or sarin or 10 milligrams of VX are required. Skin toxicity for VX requires a quantity that is 100 to 200 times less than either mustard or sarin.

(NOTE: BIOLOGICAL AGENTS ARE MUCH MORE TOXIC BY WEIGHT THAN CHEMICAL AGENTS – E.G. BOTULINUM IS OVER A THOUSAND TIMES MORE TOXIC THAN VX)



## **BLOCK DATA SHEETS** – *What If They Put LSD in the Drinking Water?*

*How much?* In an April 20, 1972 study, the U. S. EPA estimated it would take about 166.8 pounds of LSD per 100,000,000 gallons of water to provide an effective dose (50 micrograms) of LSD in a drinking water supply (this amount takes into account the amount of LSD that would be destroyed by the chlorine residual present in most drinking water). **Let's do the math!**

*Water supplies* Capacities of three typical sources of drinking water in California.

| Lake/Reservoir | Capacity (acre feet)* |
|---|---|
| Lake Arrowhead | 48,000 |
| Lake Nacimiento | 350,000 |
| Briones Reservoir | 68,000 |

*1 acre foot of water = 325,900 gallons.

| Lake/Reservoir | Capacity (gallons) |
|---|---|
| Lake Arrowhead | 15,643,200,000 |
| Lake Nacimiento | 114,065,000,000 |
| Briones Reservoir | 22,161,200,000 |

*LSD needed* Amount of LSD needed in each reservoir to provide an effective dose and overcome the effects of the typical chlorine residual:

| Lake/Reservoir | LSD Needed (lbs) |
|---|---|
| Lake Arrowhead | 26,093 |
| Lake Nacimiento | 190,260 |
| Briones Reservoir | 36,965 |

*Cost?* Cost of LSD needed in each reservoir to provide an effective dose and overcome the effects of the typical chlorine residual:

| Lake/Reservoir | Cost of LSD |
|---|---|
| Lake Arrowhead | $1.2 Billion |
| Lake Nacimiento | $8.7 Billion |
| Briones Reservoir | $1.7 Billion |

## BLOCK DATA SHEETS – *About "E" – Some Nontechnical/Basic Info*:*

*E Defined:* There are many perspectives and definitions for the term "Explosion." In the Haz Mat world, we think of the Department of Transportation definitions of explosives (Class 1.1-1.6). The FBI defines explosions as "the sudden and rapid escape from a confined space, accompanied by high temperatures, violent shock and loud noise." They further "type" explosions as Mechanical (e.g. BLEVE), Chemical (all manufactured explosives except nuclear explosives) and Nuclear (e.g. Atomic Bomb). Generally, an explosion can either go through a "Deflagration/ Rapid Combustion" process (subsonic @ –740 mph), like a bullet from a gun – OR - "Detonation/ Instantaneous Combustion" process (supersonic @ 740+ MPH and with a shock wave), like blowing up a stick of dynamite. Someone once said that an explosion is the sudden going away of something that was once there (including people), accompanied with a loud noise and heat.

*E Terms:* **Low Explosives:** (e.g. Black Powder) Deflagrates - No shock or blasting cap required.
**High Explosives:** (e.g. TNT) Detonates (w/ shattering effect) - Must have an initiator.
**Primary High Explosive:** Extremely sensitive high explosive (e.g. Lead Azide).
**Secondary High Explosive:** Relatively insensitive high explosive (e.g. PETN).
**High Order Detonation:** Complete detonation/explosion – Nothing left.
**Low Order Detonation:** Incomplete reaction – residuals left (i.e. toxic phosgene).
**Initiation/Stimuli:** Heat, friction, impact, shock & ESD can set off a charge.
**Initiators/Primers:** Used to set off a charge (i.e. fuses, blasting caps, Detcord, etc.).
**Boosters/Amplifier:** May be needed to set off a charge (i.e. PETN, RDX, HMX, etc.).
**Main Explosive Charge:** The main blasting agent (i.e. Dynamite, TNT, ANFO, etc.).

*E Types:* **Commercial Energetic Materials:** Propellants (e.g. AP), Pyrotechnics (e.g. M80), Explosives (e.g. Dynamite) Commercial Chemicals (e.g. ANFO), etc.
**Military Ordnance:** Grenades, Projectiles (e.g. 155 mm shell), Rockets (e.g. RPG), Mines (e.g. Claymore), Submunitions (e.g. Bluies), Bombs, Bulk Explosives (e.g. TNT), Incendiaries (e.g. flares), Simulators (e.g. flash banger), Chemical Bombs (e.g. VX), etc.
**Improvised "Explosive" Devices (IEDs):** Almost anything (e.g. pipe bombs)
***Other?:*** *A "Bomb Threat" (phone, mail, etc.)!*

*E Hazards:* Blast, fragmentation, heat, toxicity, etc. – Which may cause death, injury and/or illness!

*E Factoids:* All UN Classes are capable of exploding (e.g. flammable mixed with an oxidizer)!
Even low explosives can detonate if put in the right form, confined, contaminated, etc.
Fragmentations (bomb casings, debris, etc.) injure and kill more people than the blast.
A "Shape Charge" (conical or linear) pointed at a target will produce a greater effect.
Decreasing by ½ the distance to the explosive increases the blast pressure 8-10 times.
***For detailed technical info see: APPENDIX E – NBC+E BIBLIOGRAPHY!**

## **BLOCK DATA SHEETS** – *More About Bombs & Explosions:*

Generally, a "bomb" or "explosion" can either "deflagrate" (rapid combustion at subsonic speeds) or "detonate" (instantaneous combustion at supersonic speeds, with a shock wave). Both can kill! When an explosive is "detonated," it instantaneously (approximately 1/10,000 of a second) is converted from a solid into a rapidly expanding mass of gas (sublimation). These gases exert pressures of about 700 tons per square inch and rush away from the point of detonation at velocities up to 13,000 miles per hour, compressing the surrounding air. Detonation of an explosive will produce three primary effects (Blast Pressure, Fragmentation and Incendiary/ Thermal effects), and several secondary effects (e.g. fires, toxic residue, etc.).

In the Blast Pressure effect, there are two phases: Positive Pressure and Negative Pressure phases. In the Positive Pressure phase (known as the shock wave), air is compressed and pushed outward, at speeds ranging from 3,300-29,000 feet per second. Like a giant wave, weighing tons, it smashes and shatters anything in its path until it runs out of power (it can be up to 5 times more powerful than a hurricane). In the Negative Pressure phase, the movement is reversed due to a partial vacuum created in the Positive Pressure phase. Although not moving nearly as fast, the inward pressure wave still has great velocity and destructive capability (it is less powerful than the Positive Pressure phase, but lasts 3 times longer). Generally, explosions take the path of least resistance, in that they will give off their force at 90 degree angles from the surface of the explosive. A "Shape" charge can focus the blast effect, causing greater damage at the place where it is directed.

The Fragmentation effect causes damage by objects (bomb casing parts, debris, etc.) being thrown outward at distances farther than the blast pressure. "Shrapnel" (i.e. nails, ball bearings, etc.) can be attached inside or outside the device to increase the "fragmentation" hazard. These "fragments" are generally the main cause of bombing injuries and deaths. The blast pressure and fragmentation hazards are the main reasons to be at a safe distance AND behind a substantial barrier/shield.

The Incendiary/Thermal effect generally has a smaller part in the explosion. In general, a low explosive will produce a more sustained incendiary thermal effect than a high explosive. A high explosive, on the other hand, will produce much higher temperatures (ranging from 3500 to 6000 degrees Fahrenheit). In either case, the duration of the effect is measured in fractions of seconds.

In the time allotted, this class can NOT focus in depth, and with technical expertise, on explosives (or any other Weapon of Mass Destruction). Participants are encouraged to refer to the "Appendix E – NBC+E Bibliography" in the back of this notebook to pursue more in-depth and technical information on this subject.

*Please remember this:* A bomb can easily explode and take out anything in its path, including you! If you discover a bomb: Withdraw to a safe distance (and behind a substantial barrier), call the bomb squad/EOD unit and do it on a land/hard line!

## **BLOCK DATA SHEETS** – *Bombs/E vs. NBC*

A "Bomb/Explosive" device is the weapon of choice (70%) if a terrorist's objective is to kill a large number of people. Why? Compared to NBC agents, it is less complex, cheaper, easier to make, simpler to use and more reliable. Most terrorist incidents in the United States have been bombing attacks, involving detonated and undetonated explosive devices, pipe bombs and incendiary devices (see "Terrorist Bomb Related Incidents – USA). Between 1990-1995, FBI data indicated about 10,000 actual bombings resulting in over 300 deaths and 3000 injuries. The more notable bombings included the 1993 first World Trade Center bombing (killing 6), 1995 Oklahoma City bombing (killing 168), and of course, not a bombing, but the infamous 9/11/01 incident (killing about 3000).

Most bombs are simple two "Train" devices including an initiator and main bursting charge (bombs using blasting agents require the addition of a "Booster"). The most commonly encountered bomb is a "Pipe Bomb." The most commonly used explosives are black powder and smokeless powder. Some domestic attacks have been "Incendiary" devices (20-25%), like "Molotov Cocktails" (or sulfuric acid and gasoline, with potassium chloride and sugar). Improvised devices can be made from a variety of common household chemicals and containers. A simple PVC pipe, capped at both ends, with black powder (plus optional nails or ball bearings for shrapnel), and a fuse as an initiator can cause an effective explosion. Even corn starch, flour or sugar can become explosive under the right conditions. Dry ice or acid bombs, easily made and used, can pose hazards to the public and responders.

Explosive and nonexplosive devices can be used as "Booby Traps" designed to injure or kill responders. Booby traps may include toxic gas generators (e.g. hydrogen chloride), expanding gas bombs (e.g. dry ice and water), grenades, pipe bombs, letter/package/book bombs, satchel charges, car/van bombs, flashlight bombs, etc. The most common methods of ignition include blasting caps, percussion primers, and flash bulbs (others include mouse traps, electric switches, clock timers, photosensors, etc). The most widely used main charge for improvised devices is black powder (other commonly improvised explosives include match heads, smokeless powder and Ammonium Nitrate (AN) fertilizers). Improvised devices can be very unpredictable and sensitive. Some explosions can be triggered by a light, small vibration, sound, transmission of a radio and static electricity (uniforms and "Firefighter Turnout" gear are great generators of static electricity). Improvised devices are likely to produce a low order explosion, which could leave toxic materials such as phosgene, phospene, isocyanates, etc.).

After 9/11/01 the concern regarding the use of Nuclear, Biological and Chemical agents as weapons has increased. However, compared to bombs/explosives, NBC agents are more complex and difficult to obtain, develop, maintain and disperse as an effective weapon for terrorists, especially those lacking "State Sponsorship." In the many years to come, it is highly likely that bombs/explosives will continue to be the weapon of choice for most terrorists wanting to kill people.

## **BLOCK DATA SHEETS** – *Terrorism Bomb Related Incidents - USA:*

- Haymarket Riot and Bombing (Chicago, IL). A bomb exploded during a demonstration staged by anarchists. Eleven people were killed, and more than 100 others wounded in the bombing and ensuing riot. (1886)
- Union terrorists bomb the Vindicator Mine in Cripple Creek, CO killing 26 miners and injuring 50. (1903)
- A community activist throws a bomb into a squad of NYPD officers killing 1 bystander and injuring several police officers. (1908)
- Union terrorists bomb the Los Angeles Times Bldg., killing 21. (1910)
- Frank Holt bombed the U. S. Capitol in protest of U. S. arms sales to warring European nations. (1915)
- A bomb explodes in San Francisco during a parade killing 9 and injuring 41. Perpetrator never caught. (1916)
- Anarchists bomb the home of the U.S. Attorney General and 8 other government buildings in Washington, DC. (1919)
- Headquarters of J.P. Morgan and Company in New York City bombed. 38 killed, 200 injured. (1920)
- A disgruntled former employee plants a pipe bomb at the Edison Building in New York City, the first of 37 bombs the man will plant in New York City over the next 16 years. (1940)
- A bomb explodes on a commercial airliner flying over Colorado killing all 44 persons on board. The bomb was placed by the son of one of the passengers who wanted the insurance money. (1955)
- Over a dozen bombings/arsons attributed to the KKK and related groups directed against black churches and organizations in the Southeastern states of the U.S. One bombing in Birmingham, AL in 1963 kills 4 children in their Sunday School classroom. (1957-66)
- A bomb explodes on a commercial airliner enroute to Kansas City, MO from Chicago, IL killing all 45 persons onboard. (1962)
- A bomb exploded in a men's room in the U.S. Capitol building. Weather Underground claimed responsibility and said bombing was in protest of U. S. military incursion into Laos. The group set off over 4,000 bombs from 1969-1970. (1970)
- Explosion destroys a New York City townhouse. The building was occupied by radicals who were believed to be assembling a bomb when the explosion occurred. (1970)

## **BLOCK DATA SHEETS** – *Terrorism Bomb Related Incidents – USA (cont.):*

- Student radicals blow up University of Wisconsin computer lab killing one person. (1970)
- Jewish Defense League firebombs office of Sol Hurok (impresario who managed American tours of Soviet performers). (1972)
- FALN (Puerto Rican separatist group) sets off bomb in Fraunces Tavern in Wall St. area of NYC. Killed 4 and injured 53. (1975)
- A bomb combined with an intentional natural gas leak destroys a café in Lowell, MA and injures 23. (1975)
- Unknown terrorists bomb a terminal at La Guardia Airport in New York City, killing 11 and injuring 70. (1975)
- Unknown individuals place 5 bombs in the Quincy, IL area in an attempt to assassinate Vice Presidential candidate Bob Dole. (1976)
- Weather Underground sets off bomb near U.S. State Dept. building in Washington D.C. No injuries. (1975)
- FALN bombs 2 office buildings in NYC. 1 dead 7 injured. (1976)
- Unabomber bombings. (1978-95)
- A bomb explodes in Harvey's Casino in Stateline, NV causing $18 million in damage. No deaths or injuries. (1980)
- Letter and pipe bombs explode in various locations in the southeast U.S. Investigations determine white supremacists were responsible. (1989)
- World Trade Center bombing. 6 killed and over 1,000 injured. (1993)
- Oklahoma City bombing. 168 killed. (1995)
- A bomb derails an Amtrak train near Phoenix, AZ. 1 crewmember killed and 100 passengers injured. (1995)
- Olympics Centennial Park bombing. 1 killed, 112 injured. Several months later, a similar bomb exploded at a bar in Atlanta that catered to a gay and lesbian clientele. (1996)
- Two bombs explode at an Atlanta, GA abortion clinic. The second bomb injured 6 and was suspected of being intended to kill emergency responders. (1997)
- 9/11 "multiple terrorist attacks" in New York, Washington D.C., and Pennsylvania, kills about 3000, including over 400 emergency responders. (2001)

## BLOCK SUMMARY SHEETS

*Terrorism Definitions:* There are many definitions of terrorism. The word comes from Latin origins meaning, to frighten. Note the FBI definition. For this course we simply define terrorism as any group or individual that uses WMD (defined as any Nuclear, Biological, Chemical or Explosive Weapon) causing an emergency response.

*Terrorist Groups:* There are many groups with differing "Purposes/Objectives" and motives. Note: Most terrorist groups want to achieve their objectives, without killing people. However, "Apocalyptic" groups (i.e. extreme religious, political, racist or single issue groups) are the exception, in that their objective is to kill lots of targeted people. These groups may be likely to use WMD. Some groups may be "State Sponsored" which may increase their chances of successfully using WMD on specific targets.

*Targets:* There are many targets, depending on the terrorist group and it's objectives. A racist or religious group may attack a church or synagogue. A date (e.g. April 19) may be a target for an attack. Note: Responders have been the targets of an attack! In short, any U.S. community with roads, buildings, infrastructure, people, etc., could be a target. There are "hard" and "soft" targets! It is important to survey your local area for high vulnerability "hard" and "soft" targets (a "Vulnerability Assessment System" may help your agency prioritize the most vulnerable targets)!

*Deterrents:* All of us can help deter a possible terrorist attack. At the very least we should be observant of suspicious individuals, groups, vehicles, occupancies, objects and actions. If something is suspicious/does not look right, report it to law enforcement!

*Trends:* Before 9/11/01, terrorist incidents were going down but were showing signs of more lethality. Post 9/11/01 has created a greater concern for terrorists using WMD/ NBC+E weapons within our country. Note: NBC+E incidents have happened worldwide (BC+E incidents have happened in the U.S.) and may happen again!

*Weapons:* When weapons are used, over 70% of the weapons are "Explosives/Bombs" (per FBI). Usually, if terrorists use weapons, they use weapons that are available, simple and reliable. Today, use of "NBC" weapons are now an added concern.

*Key Question:* If/When a NBC+E incident occurs, are you prepared to respond safely and competently at the "FRO" level?

## **BLOCK SUMMARY SHEETS** (cont.)

*NBC+E Types:* NUCLEAR Weapons:

1. Source (i.e. Cesium, Cobalt, Radium, etc.)
2. RDD (Radiological Dispersion Device or "Dirty" bomb)
3. Weapon (e.g. crude Atomic/Fission Bomb, etc.)

\+ *Just a "Threat" of a nuclear problem (i.e. Nuclear Power Plant, Hoax, etc.)!*

BIOLOGICAL Weapons:

1. Bacteria (i.e. Anthrax, Cholera, Plague, Tularemia, Typhoid, etc.)
2. Virus (i.e. Ebola, Yellow Fever, Smallpox, Encephalitis, etc.)
3. Toxins (i.e. Ricin, Botulinum, Mycotoxin, Aflatoxin, etc.)

\+ *Rikettsia (i.e. Q Fever), Fungi, Molds, etc.*

CHEMICAL Weapons:

1. Nerve (i.e. GA/Tabun, GB/Sarin, GD/Soman, VX, etc.)
2. Blood (i.e. AC/Hydrogen Cyanide, CK/Cyanogen Chloride, Arsine, etc.)
3. Blister (i.e. H/Mustard, L/Lewisite, CX/Phosgene Oximine, etc.)
4. Choking (i.e. Cl/Chlorine, CG/Phosgene, Diphosgene, etc.)
5. Irritating (i.e. OC/Pepper Spray, CS/Tear gas, CN/Mace, etc.)

\+ *Many common "Industrial" chemicals (i.e. Ammonia, Acids, LPG, etc.)!*

EXPLOSIVE Weapons:

1. Commercial Energetic Materials (e.g. Dynamite)
2. Military Ordnance (e.g. Grenade)
3. Improvised Devices (e.g. Pipe Bomb)

\+ *A "Bomb Threat" (phone, mail, etc.)!*

*NBC+E Risks & Primary Hazard:* Risks of Exposure via: Inhalation, Absorption, Ingestion & Injection
"N (source), B & C" = Health/***Highly Toxic***!
"N (RDD & A Bomb) +E" = Blast Wave + Fragmentation + Thermal!

*Haz Mat vs. NBC+E:* SIMILARITIES: OSHA Haz Mat incident, PPE, Zone, Decon, Classes, etc.
DIFFERENCES: Deliberate act designed to kill lots of people, a major crime scene, a potential for mass casualties, attention, media, chaos, etc. Additionally: "NBC" can be highly toxic, sometimes persistent and not easily recognized!

*Bottom Line:* FROs at NBC+E incidents will be faced with chaos, conflicting information and huge challenges – They must recognize NBC+E, and are expected to initiate safe defensive actions to protect themselves and the public! They must safely and competently respond to an NBC+E incident (within their "OSHA" FRO level, resources and capabilities). **But they first must recognize NBC+E**!

# BLOCK ISSUES SHEET

Focus on **K**ey **R**esponse **I**ssues (**KRI**) in every Block of Instruction!

Here are some ideas for this block (Pick one, rank them or select your own **KRI**):

- ☑ Who are the likely "Terrorist Groups" (incl. their objectives) that might strike my area?
- ☑ What are the most vulnerable "Targets" in my area?
- ☑ What are the "Types" and associated "Hazards" of NBC+E weapons?
- ☑ What are the "Similarities & Differences" in responding to a Haz Mat vs. a WMD incident?
- ☑ What are the "Differences" in responding to an N, B, C or E incident?
- ☑ Where can I go to get additional training on NBC+E incidents?
- ☑ **Am I prepared to respond safely & competently as a "FRO" to an NBC+E incident?**

*Your **K**ey **R**esponse **I**ssue (**KRI**) for this block is?*

_____

_____

_____

_____

_____

_____

_____

# BLOCK ACTIVITY SHEET

*(INSTRUCTOR MAY SELECT ONE OR MORE OF THE FOLLOWING ACTIVITIES):*

*ACTIVITY A.* Within your group, list the types of NBC+E weapons, providing as many examples for each type as possible. Be prepared to provide your list to the class.

*ACTIVITY B.* Within your group, or as individuals, identify the top 5 vulnerable targets in your area, using a "Threat Assessment" system.

*ACTIVITY C.* Per your assigned "fictitious" terrorist group, come up with a terrorist act (weapon and likely target) that will support your group's purpose/objective. You only have one chance for success in the attack. Be prepared to provide a summary report to the class.

*OTHER ACTIVITY:*

# BLOCK WORK SHEET

- Most "**Terrorist Groups**" want to achieve their "**P**_____**/O**_____," without _____ - Except **A**_____ groups.
- Of those terrorist groups that use weapons, the **weapon of choice** is_____**.**
- List at least 5 likely "**Targets**" of a terrorist attack in your community:
- Describe the "**current trend**" for terrorist/other groups using NBC+E agents within the U.S.:
- Identify the "**Bottom Line Question**" a FRO must ask if NBC+E weapons are used:
- List the "**Types**" (with one example each) of the following NBC+E Weapons:
  - Nuclear: _____**,** _____**,** _____**.**
  - Biological: _____**,** _____**,** _____**.**
  - Chemical: _____**,** _____**,** _____**,** _____**,** _____**.**
  - Explosive: _____**,** _____**,** _____**.**
- The "**Primary**" hazard for an "N (source), B & C" incident is _____**,** & for an "N (RDD & A Bomb) + E" incident are _____ **+** _____**+** _____**.**
- What are the "**Similarities & Differences**" of a Haz Mat vs. a WMD incident:
- The WMD FRO "**Role**" is to **S**_____ and **C**_____ respond, within the FRO **L** _____ **, R** _____ **,** and **C**_____**.**
- The WMD FRO "**Goals**" are to protect, in order: **L** _____**/H**_____, **C** _____ **S**_____, **E** _____, and **P**_____.
- The WMD FRO needs to "**balance**" priority **L** _____ **S** _____ activities, with **E**_____ preservation.

# C

## *California Specialized Training Institute*

| | |
|---|---|
| **Block Title:** | Recognizing WMD/NBC+E Weapons |
| **Class:** | Hazardous Materials: FRO–WMD |
| **Block Scope:** | Instructor to cover the following: Identify the indicators that would help first responders recognize when an incident may involve NBC+E weapons. Identify at least one recognition clue and physiological sign/symptom for each type of NBC+E weapon. Briefly note the value and limits of the "Identification and Hazard Assessment" (IDHA) steps to validate incident information. |
| **Block Main Points:** | Block Purpose & Focus<br>General Haz Mat & NBC+E Recognition Clues<br>Specific "Nuclear" Type Weapon Clues<br>Specific "Biological" Type Weapon Clues<br>Specific "Chemical" Type Weapon Clues<br>Specific "Explosive" Type Weapon Clues<br>IDHA, Intelligence & The NBC+E Recognition Matrix<br>Wrap-up, Issues & You |
| **Support Material:** | *See Block Note Sheet/Outline, Data Sheets, Issue Sheet, Activity Sheet and Work Sheet on following pages* |
| **Additional References:** | *See Appendix E (NBC+E Bibliography) for further references as needed* |
| **Time Recommended:** | 90 to 120 Minutes |

Block C

# *Recognizing WMD/NBC+E Weapons*

## Main Points

- Block Purpose & Focus
- General Haz Mat & NBC+E Recognition Clues
- Specific "Nuclear" Weapon Type Clues
- Specific "Biological" Weapon Type Clues
- Specific "Chemical" Weapon Type Clues
- Specific "Explosive" Weapon Type Clues
- IDHA, Intelligence & The NBC+E Recognition Matrix
- Wrap-up, Issues & You

# BLOCK NOTE SHEET/OUTLINE

- **Block Purpose & Focus**
  - Purpose
  - Focus
  - NOTE: Need to First "Recognize" WMD (incl. Threats & Hazards)

- **General Haz Mat & NBC+E Recognition Clues**
  - NFPA Haz Mat Recognition Clues:
    - Occupancy/Location
    - Container Shapes
    - Markings & Colors
    - Placards & Labels
    - Shipping Papers & MSDSs
    - Senses (last resort – use "Common" sense)
  - Primary NBC+E Recognition Clues:
    - Nuclear - Monitoring
    - Biological – Delayed Symptoms
    - Chemical – Sudden Symptoms
    - Explosive – Blast or Bomb Like/Unusual Looking Device
  - Other NBC+E Recognition Clues:
    - Physical State
    - Color
    - Odor
    - Signs & Symptoms
    - Mass Casualties Next to Target Site

- Other NBC+E Recognition Clues (cont.):
  - Low Lying Clouds or Mists
  - Dispersion Devices
  - Unusual Surrounding Factors
  - Eye Witness Reports/Credible Threat
  - Common Sense/Gut Feeling/*Something Does NOT Look Right!*

- **Specific "Nuclear" Weapon Type Clues**
  - Nuclear Weapon Types:
    - Source – Trefoil Marking, Med Waste Label, etc.
    - RDD – Low/Dud Explosion without Damage, Monitoring, etc.
    - Weapon – Projectile/Bomb Like Shape, Military Markings, etc.

- **Specific "Biological" Weapon Type Clues**
  - Biological Weapon Types:
    - Bacteria - Anthrax – Suspicious Letter, etc.
    - Virus - Smallpox – Infected Host, etc.
    - Toxins - Ricin – FBI or CDC Alert, etc.

- **Specific "Chemical" Weapon Type Clues**
  - Chemical Weapon Types:
    - Nerve - GB/Sarin – Miosis, etc.
    - Blood - AC/Hydrogen Cyanide – Red Lips, etc.
    - Blister - H/Mustard – Red Skin, etc.
    - Choking - Cl/Chlorine – Breathing Difficulty, etc.
    - Irritating - OC/Pepper Spray – Teary Eyes, etc.

- **Specific "Explosive" Weapon Type Clues**
  - Explosive Weapon Types:
    - Commercial Energetic Materials – Manufacturer, Color, Markings, Form, etc.
    - Military Ordnance – Color, Markings, Form, Fuse, Material, "Bomb Like," etc.
    - Improvised "Explosive" Devices/IEDs – Unusual Device/Form, Trip Wires, etc.

- **IDHA, Intelligence & The NBC+E Recognition Matrix**
  - "Identification & Hazard Assessment (IDHA)" Steps:
    - Identify Agent/Chemical Name
    - Assess All Hazards
    - Assess Physical, Chemical & Toxicological Properties
    - Assess Variables/Modifying Conditions
    - Predict Behavior/Natural Outcome
  - Sources of Information to Help with IDHA:
    - ERG, MSDSs & CHEMTREC
    - Other "Open" Sources, etc.
  - Information vs. Intelligence:
    - May Initially Get "Information" that is Inaccurate, Incomplete, Conflicting, etc.
    - Need to Eventually Get "Intelligence" that is:
      - Verified (by 3 sources)
      - Prioritized (per life/health, crime scene, environment & property)
      - Organized (in any useful format)
      - Analyzed (by those with expertise)
      - Made Useful (for response)
  - NOTE: After Recognition Need to Try to IDHA:
    - Gather, Verify, Assess "Non-Classified Info/Intelligence & SHARE IT!
    - Communicate Incident Info/Intelligence to Law Branch or IC

- IDHA, Intelligence & The NBC+E Recognition Matrix (cont.)
  - However – Please Remember Limits & Value of IDHA:
    - NBC+E Initially Driven by Recognition Clues – Not IDHA
    - IDHA & Intelligence Will Help Later in the WMD Incident
  - Several Indicator Matricies May Help in Recognition:
    - U.S. Army Matrix
    - Jane's Chem Bio Handbook Matrix
    - FBI and/or ATF Chart
    - LACFD NBC Matrix, etc.
  - Need to Develop/Know Your Own Recognition "Mind Jogger" for:
    - Nuclear Weapons
    - Biological Weapons
    - Chemical Weapons
    - Explosive Weapons

- **Wrap-up, Issues & You**
  - Block Key Point Summary
  - Block Key *Response* Issues:
  - Your Issues/Questions

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***"To know your enemy is to defeat your enemy."***

*(Maximus)*

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## **BLOCK DATA SHEETS** - *Nuclear Detection Considerations*

*The "Threat"* Even the threat of a nuclear incident will create fear in the general public
(The nuclear field is a complex science – The following are general considerations)

*Radiation Types:* Alpha (travels short distance in air, stopped by paper & harmful if internalized)
Beta (travels a few feet in air, stopped by tin foil & harmful if internalized)
Gamma (travels many feet in air, penetrates most materials, internal & external harm)

*Rad Measure:* Generally measured by survey meters in Roentgens (R)
Note: Term "Roentgen Equivalent Man" (REM) [1 REM = 1000 milliRem]
Note "International" Term & Conversion: 100 REM = 1 Sievert (Sv)
Note: Term for unit of "Radiation Absorbed Dose" (RAD)
Note "International" Term & Conversion: 100 RAD = 1 Grey (Gy)
General conversion of "RAD" to "REM" – Alpha = 20x1; Beta & Gamma = 1x1

*Rad Meters:* CDV 700 Survey Meter (low range Gamma + high energy Beta detection)
CDV 715 Ionization Chamber (high range Gamma – No Alpha or Beta detection)
CHP 450 Meter (Alpha, Beta & Gamma detection), etc.

*"ALARA":* "As Low As Reasonably Achievable" concept for radiation exposure by humans

*"TDS" Concept:* **T**ime (the shorter the time in a radiation field, the less radiation exposure)
**D**istance (the farther away from the source, the lower the radiation dose)
**S**hielding (using "barriers" can reduce exposure – i.e. Turnouts & SCBAs)

*REM Guides:* Approximately 1 milliRem = Background radiation per day
Average chest X-Ray = 10-15 milliRem
10 REM = Voluntary exposure (whole body lifetime) for mitigation
25 REM = Voluntary exposure (whole body lifetime) for rescue
Approximately 50 REM = No obvious effects (except possible blood changes)
Approximately 100 REM = Vomiting and nausea for 5-10% of those exposed
Approximately 300 REM = LD 50 within 60 days of exposure for those untreated
Approximately 750 REM = LD 100 for those untreated within about 2 weeks

*Sources:* Easily available/attainable – Most coming from hospitals and X-Ray labs (i.e. blood irradiators, sterilizers, cancer treatment irradiators, etc.)

*RDD:* Low yield explosive device designed to spread radiation source – More for economic damage and fear vs. weapon to kill large numbers of people!

*Weapon:* Least likely to be used due to difficulty to successfully obtain, make & maintain
Fission: Splitting atom (e.g. A Bomb) – Fusion: Combining atoms (e.g. H Bomb)
Plutonium used to create atomic reaction is an Alpha emitter
Size and configuration of weapon will vary – Could be as small as a suitcase
Weapons have "Permissible Action Links" (PAL) required before activation

## **BLOCK DATA SHEETS** – *Recognizing Radioactive Material*

Radiation is the invisible energy emitted by certain types of unstable (or radioactive) atoms. This energy travels through the air, but cannot be seen, felt, smelled, or tasted. Some types of radiation can penetrate through packaging materials, vehicles, and building walls. When radiation energy reaches a person, the person is exposed to radiation. The amount of radiation energy absorbed by a person is the dose the person received. A small dose of radiation (for example, from a dental x-ray) has a very low risk of health effects. A high dose of radiation (such as sitting near an industrial radiography source for several hours) has a high risk of health effects, including nausea, vomiting, diarrhea, burns, and possible death. Terrorists may use radiological material as WMD to injure or kill people, or to create fear among the public.

The four types of radiation emitted by radioactive material are alpha, beta, gamma, and neutron radiation. The radiation travels from the radioactive material in all directions (including upwind) and the distance it can travel ranges from ¼ inch to hundreds of feet, depending on the specific type of radioactive material. The further the radiation travels, the weaker (and less hazardous) it becomes. The *Emergency Response Guidebook (ERG)* Guide 163 recommends isolating a spill, leak, or damaged container of radiological material for at least 25 meters (75 feet) in all directions.

Radioactive material is material containing unstable (radioactive) atoms that emit radiation. Radioactive material may be a solid, liquid, or gas. Many of the types of radioactive material released into the public by terrorists may be in the form of dust or powder. Even when this radioactive material is properly contained, it still emits radiation and may be a hazard. The radioactive material is not considered to be contamination until is released from its container. Some radioactive materials only emit small amounts of radiation and are little threat to responders or the public. Other types of radioactive materials are highly radioactive and emit large, dangerous amounts of radiation.

Radioactive contamination is radioactive material in an unwanted place, particularly where its presence may be harmful. Some types of contamination may be readily spread from one surface to another. Some contamination may be suspended in the air. In a deliberate release of radioactive material by terrorists, this contamination may be in the form of radioactive dust (ceramic or powder).

Even if used as a terrorist weapon, most of the radioactive sources (devices or items with radioactive material) in use in the U.S. do not meet the definition of a WMD, as defined in Title 18, U.S.C. 2332a, because they do not "release radiation or radioactivity at a level dangerous to human life." Examples of radioactive sources that do not emit life-endangering amounts of radiation are smoke detectors, tritium night sights on firearms, vials of radiopharmaceuticals (radioactive drugs), lantern mantles, tungsten welding rods, industrial moisture/density gauges (also called portable nuclear gauges), and most radioactively-contaminated medical waste. As explained in *ERG* Guide 163, packages (cartons, boxes, drums, articles, etc) identified as "Type A" by marking on packages or by shipping papers contain non-life endangering amounts of radioactive material.

## **BLOCK DATA SHEETS** – *Recognizing a Radioactive "Source"*

A radioactive material "source" may take many different forms, but the energy radiated or transmitted in the form of rays, waves, or particles serves the particular purpose of the terrorist. Terrorists may place a stolen industrial radiation source in a building or public location, irradiating (but not contaminating) individuals in the immediate area every day until the source or device is discovered, or the victims begin to show recognizable symptoms.

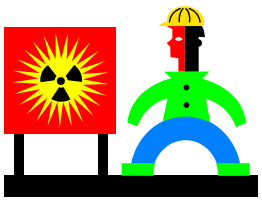
- A radiation exposure device is a radiation source placed to expose victims to high levels of radiation. Terrorists may place a stolen industrial radiation source in a building or public location. This would irradiate, but not contaminate, individual victims every day until the device is discovered, or until the victims start to show recognizable symptoms.

- According to Nuclear Regulatory Commission (NRC), there may be about two million radioactive sources across the United States. Radioactive sources are located at hospitals, medical facilities and cancer treatment facilities (i.e. blood irradiators, sterilizers, cancer treatment irradiators, etc.), industrial and construction sites (i.e. radiography cameras, food irradiators, etc.), university and research labs, in transport (road, rail, waterways, and air), nuclear power plants, and government facilities. Cases in which radioactive material is lost or misplaced are infrequent. More common, are situations where devices containing radioactive material are stolen from jobs or work sites, or are abandoned. For the years 1998–2002, there has been an average of 300 such cases per year.

- A small stainless steel cylinder can contain a small amount of material that emits neutrons and gamma radiation. This stainless steel source configuration is commonly about one-quarter-inch in diameter and about three-quarter-inch to one-inch long. Many industrial sources are manufactured in the shape of disks about the size of a quarter (about one inch diameter by one-quarter-inch thick) and made of steel or plastic.

- Radiation sources often do not have the radiation symbol on them, although the original containers for dangerous sources usually do. Containers for industrial gamma sources can be about six inches in diameter by 10 inches high and weigh 40 to 80 pounds each, due to the lead shielding.

- Any package, container, backpack, etc. that seems to weigh much more than it normally should may contain lead or depleted uranium being used to shield (or block) the radiation from a dangerous source**.**



## **BLOCK DATA SHEETS** – *Recognizing a "RDD"*

A Radiological Dispersal Device (RDD) or "dirty bomb" is a conventional explosive or bomb containing radioactive material. The conventional bomb is used as a means to spread radioactive contamination. It is not a nuclear bomb and does not involve a nuclear explosion. Note:

- Any type of radioactive material could be used in a dirty bomb, but in general, these devices would be unlikely to cause serious health effects beyond those caused by the detonation of conventional explosives, according to the U.S. Nuclear Regulatory Commission.

- Radioactive material may also be dispersed by methods other than explosives.

- An RDD may be as simple as a pipe bomb or explosives attached to a shipping container of radiological material, as shown on the previous slide in the figure on the left. Because of the wide availability of radiological material throughout the world and the ease of building simple explosives, the probability of the use of an RDD is much higher than that of a nuclear weapon.

The probable effects of a dirty bomb detonation would be:

- Potential for panic in the general public

- Contamination areas near the RDD blast site

- Probably not lethal radiation dose levels

- Huge numbers of people think they are contaminated

- Small number seriously contaminated

- May need regional decontamination sites to handle thousands

- Limited radiation detectors and trained personnel would add to the problem

Another example of an RDD may be an industrial radiography source container breached by gunfire. This container has depleted uranium as the shielding material. Even if the source capsule itself is not breached, the breached container may release some of the depleted uranium, which is a source of beta and gamma radiation. Yet another example of an RDD may be a vial of radiopharmaceuticals (the radioactive material injected into patients for medical testing and treatment) broken open on a public street. Radiopharmaceuticals can be in a liquid, solid or gas form. Even though breaking open these vials may not create life-threatening radiation hazards, it may generate a response, news reports, and a public fear level greater than the actual hazard warrants.

## **BLOCK DATA SHEETS** – *Recognizing a "Nuclear Bomb/Weapon"*

The use of a nuclear bomb/weapon (e.g. crude atomic bomb) by a terrorist would produce devastating effects, including thermal (heat) impulse, blast wave, penetrating neutron and gamma radiation, and radioactive fallout with radiological contamination, and would have a tremendous psychosocial impact on the community and the entire country. It would be a true "WMD." The following offers information, besides the obvious, regarding developing and recognizing a "Nuclear" weapon.

- There is a lower probability terrorists will detonate a nuclear weapon than an RDD. A nuclear weapon uses the energy from splitting the atoms (fission) of special nuclear material (such as certain types of uranium or plutonium).

- Terrorists may attempt to build a nuclear weapon or attempt to steal or buy one from a nation in possession of them. Note that there is "no direct evidence that any [Russian nuclear weapons] have been stolen. Russia and the U.S. monitor these activities [security of nuclear weapons]" according to a Dale E. Klein, Assistant to the Secretary of Defense Nuclear, Chemical, and Biological Programs.

- The size of a nuclear explosion may be much larger than conventional explosives. The size of nuclear explosions is measured in kilotons (kt). The energy of one kiloton is equivalent to the explosion of one thousand tons of trinitrotoluene (TNT) high explosives.

- Nuclear weapons have been made small enough to be carried by one person. Although a nuclear device with a yield similar to the atomic bombs used in World War II (16 to 23 kilotons) may devastate the center of a city, a "small" nuclear detonation of less than one kiloton may be mistaken for a large truck bomb. The area of destroyed buildings may be less than a city block.

- A mushroom-shaped cloud will not appear with every nuclear explosion. The color of the smoke column may be light brown (vaporized soil). The smoke column from ground zero is vertical and the white or light brown "smoke" is not spread out like a conventional explosion. The white "smoke" is caused by condensed water vapor in the cloud and ice that may form on the top of the mushroom. Conventional explosions and fires usually have black or dark brown smoke.

## **BLOCK DATA SHEETS** – *Acute Radiation Syndrome*

Although symptoms of radiation sickness will not be immediately observed, one should be aware of "Acute Radiation Syndrome/ARS" (or radiation sickness symptoms) if massive amounts of radiation were quickly absorbed by an individual. The following ARS information is provided:

- Victims who receive a large dose of radiation may suffer from Acute Radiation Syndrome (ARS) or "radiation sickness"
- Key symptoms are nausea, vomiting, and diarrhea
- Symptoms may not develop for hours after the exposure
- If the victims are nauseous and vomiting immediately after the release of WMD, the cause is probably not radiation exposure; many other factors besides radiation can cause nausea, vomiting, and diarrhea
- The larger the dose of radiation a victim receives, the quicker the symptoms appear and the more severe the reaction; if a victim who starts to feel nauseous six hours after the radiological WMD event, but never vomits, probably received a lower dose than the victim who became nauseous and started vomiting several hours after the event
- If the dose of radiation is high enough, the victim may die in days to weeks, but proper medical attention may save many victims if the dose was not too high
- Victims and individuals who receive lower doses of radiation may have no symptoms and have only a very small increase in their risk of developing cancer
- Some victims may also receive high enough doses of radiation to increase their risk of developing cancer in the future, but not high enough to suffer from any of the symptoms of Acute Radiation Syndrome (ARS)
- No proven cases of genetic damage to people (caused by radiation) passed on from parents to children, but there is a very small risk that it might occur
- Another indicator of ARS is the victims may seem to recover, but then the symptoms reappear hours to days later and the symptoms are more severe than before.

## **BLOCK DATA SHEETS** – *Radiation Burns*

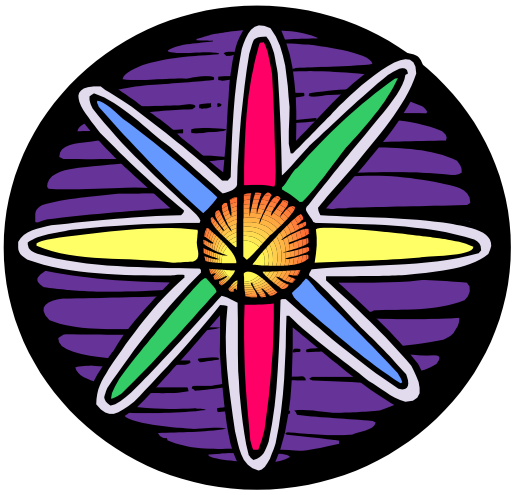
- Skin exposed to high doses of radiation may turn red and look "puffy"; burns may not appear for hours after exposure. Skin may also turn a bronze color similar to a suntan

- Lack of radiation burns immediately after a detonation or release of material does NOT mean the person did not receive a serious dose of radiation, and does not mean the person is not contaminated

- Victim with burns appearing immediately after the release of the WMD agent are probably not radiation burns, but more likely thermal or chemical burns

- Radiation burns are not painful while the damage is occurring. After burns to the skin start to develop, the skin may start to itch and become painful. Radiation burns may seem to heal, then return a day more later with more severe pain, blistering, and swelling. This is another difference from thermal or chemical burns

- In some cases where persons have found or stolen industrial radioactive sources and taken the containers apart, they suffered burns on their hands. If suspects have burns on their hands, they may have been handling, transporting, or building a Radiological Dispersal Device



## **BLOCK DATA SHEETS** - *Biological Detection Considerations*

*[Note: Several medical terms follow – check with an EMT or Doctor for definitions]*

### **Anthrax** (Bacteria - Not contagious, except cutaneous/skin Anthrax)

*Inhalation or Skin* Inhalation Anthrax requires breathing in spores. People with open cuts/wounds are susceptible to Cutaneous (skin) Anthrax. Infectious doses from Inhalation Anthrax have been debated post 9/11. Estimates ranged from 8 to 10,000 spores (some doctors believe that it might take only *a few* spores to cause fatal disease in vulnerable populations). To be effectively weaponized, these spores must be milled, polished, positively charged and successfully dispersed/aerosolized (between 1 to 5 microns). If not treated early, Inhalation Anthrax has a higher fatality rate than Cutaneous (skin) Anthrax.

*Signs/Symptoms* Incubation period is approximately 1-7+ days. Fever, malaise, fatigue, cough and mild chest discomfort is followed by severe respiratory distress with dyspnea, diaphoresis, stridor, and cyanosis. Shock and death occurs within 24-36 hours of severe symptoms.

*Diagnosis* Physical findings are nonspecific. Possible widened mediastinum. Detectable by Gram stain of the blood and by blood culture late in the course of illness.

*Treatment* Although usually not effective after symptoms are present, high dose antibiotic treatment with penicillin, ciprofloxacin, or doxycycline should be undertaken. Supportive therapy may be necessary.

### **Cholera** (Bacteria - Rarely contagious)

*Signs/Symptoms* Incubation period is approximately 12 hours to 6 days. Asymptomatic to severe with sudden onset. Vomiting, headache, intestinal cramping with little or no fever followed rapidly by painless, voluminous diarrhea. Fluid losses may exceed 5 to 10 liters per day. Without treatment, death may result from severe dehydration, hypovolemia and shock.

*Diagnosis* Clinical diagnosis. 'Rice water' diarrhea and dehydration. Microscopic exam of stool samples reveals few or no red or white cells. Can be identified by darkfield or phase contrast microscopy, and by direct visualization of darting motile vibrio.

*Treatment* Fluid and electrolyte replacement. Antibiotics (tetracycline, ciprofloxacin or erythromycin) will shorten the duration of diarrhea and shedding of the organism.

## **BLOCK DATA SHEETS** - *Biological Detection Considerations (cont.)*

### **Plague** (Bacteria - Highly contagious)

*Signs/Symptoms* Pneumonic plague: incubation period is approximately 1-3 days. High fever, chills, headache, hemoptysis, and toxemia, progressing rapidly to dyspnea, stridor, and cyanosis. Death results from respiratory failure, circulatory collapse, and a bleeding diathesis. Bubonic plague: incubation period is approximately 2 to 10 days. Malaise, high fever, and tender lymph nodes (buboes); may progress spontaneously to the septicemic form, with spread to the CNS, lungs, and elsewhere.

*Diagnosis* Clinical diagnosis. A presumptive diagnosis can be made by Gram or Wayson stain of lymph node aspirates, sputum, or CSF. Plague can also be cultured.

*Treatment* Early administration of antibiotics is very effective. Supportive therapy for pneumonic and septicemic forms is required.

### **Tularemia** (Bacteria - Not contagious)

*Signs/Symptoms* Incubation period is approximately 1-10 days. Ulceroglandular tularemia presents with a local ulcer and regional lymphadenopathy, fever, chills, headache and malaise. Typhoidal or septicemic tularemia presents with fever, headache, malaise, substernal discomfort, prostration, weight loss and a nonproductive cough.

*Diagnosis* Clinical diagnosis. Physical findings are usually nonspecific. Chest x-ray may reveal a pneumonic process, mediastinal lymphadenopathy or pleural effusion. Routine culture is possible but difficult. The diagnosis can be established retrospectively by serology.

*Treatment* Administration of antibiotics (streptomycin or gentamicin) with early treatment is very effective.

### **Q Fever** (Rickettsia - Rarely contagious)

*Signs/Symptoms* Fever, cough, and pleuritic chest pain may occur as early as ten days after exposure. Patients are not generally critically ill, and the illness lasts from 2 days to 2 weeks.

*Diagnosis* Q fever is not a clinically distinct illness and may resemble a viral illness or other types of atypical pneumonia. The diagnosis is confirmed serologically.

*Treatment* Q fever is generally a self-limited illness even without treatment. Tetracycline or doxycycline are the treatments of choice and are given orally for 5 to 7 days. Q fever endocarditis (rare) is much more difficult to treat.

## **BLOCK DATA SHEETS** - *Biological Detection Considerations (cont.)*

### **Smallpox** (Virus - Highly contagious)

*Signs/Symptoms* Incubation period is approximately 7-17 days. Clinical manifestations begin acutely with malaise, fever, rigors, vomiting, headache, and backache. 2-3 days later lesions appear which quickly progress from macules to papules, and eventually to pustular vesicles. They are more abundant on the extremities and face.

*Diagnosis* Electron and light microscopy are not capable of discriminating variola from vaccinia, monkeypox or cowpox. The new PCR diagnostic techniques may be more accurate in discriminating between variola and other orthopoxviruses.

*Treatment* At present there is no effective chemotherapy, and treatment of a clinical case remains supportive.

### **Venezuelan Equine Encephalitis** (Virus - Low contagious)

*Signs/Symptoms* Incubation period is approximately 1-6 days. Sudden onset of illness with generalized malaise, spiking fevers, rigors, severe headache, photophobia, and myalgias. Nausea, vomiting, cough, sore throat, and diarrhea may follow. Full recovery takes 1-2 weeks.

*Diagnosis* Clinical diagnosis. Physical findings are usually nonspecific. The white blood cell count often shows a striking leukopenia and lymphopenia. Virus isolation may be made from serum, and in some cases throat swab specimens.

*Treatment* Supportive only.

### **Viral Hemorrhagic Fevers** (Virus - Moderately contagious)

*Signs/Symptoms* Incubation period for Ebola is approximately 4-16 days. VHFs are febrile illnesses, with varying incubation periods, which can be complicated by easy bleeding, petechiae, hypotension and even shock, flushing of the face and chest, and edema. Constitutional symptoms such as malaise, myalgias, headache, vomiting, and diarrhea may occur in any of the hemorrhagic fevers.

*Diagnosis* Definitive diagnosis rests on specific virologic techniques. Significant numbers of military personnel with a hemorrhagic fever syndrome should suggest the diagnosis of a viral hemorrhagic fever.

*Treatment* Intensive supportive care may be required. Antiviral therapy with ribavirin may be useful in several of these infections. Convalescent plasma may be effective in Argentine hemorrhagic fever.

## **BLOCK DATA SHEETS** - *Biological Detection Considerations (cont.)*

### **Botulinum Toxins** (Toxin - Not contagious)

*Signs/Symptoms* Ptosis, generalized weakness, dizziness, dry mouth and throat, blurred vision and diplopia, dysarthria, dysphonia, and dysphagia followed by symmetrical descending flaccid paralysis and development of respiratory failure. Symptoms begin as early as 24-36 hours but may take several days after inhalation of toxin.

*Diagnosis* Clinical diagnosis. No routine laboratory findings. Biowarfare attack should be suspected if numerous co-located casualties have progressive descending bulbar, muscular, and respiratory weakness.

*Treatment* Intubation and ventilatory assistance for respiratory failure. Tracheotomy may be required. Administration of botulinum antitoxin (IND product) may prevent or decrease progression to respiratory failure and hasten recovery.

### **Staphylococcal Enterotoxin B** (Toxin - Not contagious)

*Signs/Symptoms* From approximately 1-12 hours after aerosol exposure, sudden onset of fever, chills, headache, myalgia, and nonproductive cough. Some patients may develop shortness of breath and retrosternal chest pain. Fever may last 2 to 5 days, and cough may persist for up to 4 weeks. Patients may also present with nausea, vomiting, and diarrhea if they swallow toxin. Higher exposure can lead to septic shock and death.

*Diagnosis* Diagnosis is clinical. Patients present with a febrile respiratory syndrome without CXR abnormalities. Large numbers of soldiers presenting with typical symptoms and signs of SEB pulmonary exposure would suggest an intentional attack with this toxin.

*Treatment* Treatment is limited to supportive care. Artificial ventilation might be needed for very severe cases, and attention to fluid management is important.

## **BLOCK DATA SHEETS** - *Biological Detection Considerations (cont.)*

### **Ricin** (Toxin - Not contagious)

*Signs/Symptoms* Weakness, fever, cough and pulmonary edema occur 18-24 hours after inhalation exposure, followed by severe respiratory distress and death from hypoxemia in 36-72 hours.

*Diagnosis* Signs and symptoms noted above in large numbers of geographically clustered patients could suggest an exposure to aerosolized ricin. The rapid time course to severe symptoms and death would be unusual for infectious agents. Laboratory findings are nonspecific but similar to other pulmonary irritants which cause pulmonary edema. Specific serum ELISA is available. Acute and convalescent sera should be collected.

*Treatment* Management is supportive and should include treatment for pulmonary edema. Gastric decontamination measures should be used if ingested.

### **Trichothecene Mycotoxins/T2** (Toxin - Not contagious)

*Signs/Symptoms* Very rapid onset of symptoms after exposure (from minutes to 2-4 hours). Exposure causes skin pain, pruritus, redness, vesicles, necrosis and sloughing of epidermis. Effects on the airway include nose and throat pain, nasal discharge, itching and sneezing, cough, dyspnea, wheezing, chest pain and hemoptysis. Toxin also produces effects after ingestion or eye contact. Severe poisoning results in prostration, weakness, ataxia, collapse, shock, and death.

*Diagnosis* Should be suspected if an aerosol attack occurs in the form of "yellow rain" with droplets of yellow fluid contaminating clothes and the environment. Confirmation requires testing of blood, tissue and environmental samples.

*Treatment* There is no specific antidote. Superactivated charcoal should be given orally if swallowed.

## **BLOCK DATA SHEETS** - *Chemical Detection Considerations*

### Nerve Agents

*Physical State:* Liquids – Not Gases

*Color:* Clear for most - Slightly brown for GB - Slightly amber for VX (*impurities may complicate color)

*Odor:* None for most - Slightly sweet/fruity for GB (use witnesses for odor)

*Symptoms:* Sudden onset of similar symptoms, including: Miosis (pinpoint pupils), runny nose, localized sweating, muscle spasms/contractions, nausea/vomiting, confusion or drowsiness, death

*Persistency:* G Series: 1-2 days (similar to water)
VX: Days to months (similar to motor oil)

*Note:* Can be absorbed through the skin, heavier than air and need immediate Decon

### Blood Agents

*Physical State:* Cyanide = Gas or liquid – Arsine = Gas

*Color:* Colorless

*Odor:* Cyanide = Bitter Almonds – Arsine = Garlic

*Symptoms:* Sudden onset of similar symptoms, including: Changes in breathing rate, headaches, giddiness, violent convulsions, unconsciousness with shallow breathing, change in lip (normal to red to blue) and skin color, death.

*Persistency:* Not Persistent – Highly Volatile (may dissipate in minutes)

*Note:* Hydrogen Cyanide is lighter than air and Cyanogen Chloride is heavier than air

## BLOCK DATA SHEETS - *Chemical Detection Considerations (cont.)*

### Blister Agents

*Physical State:* Mustard & Lewisite = Liquids

*Color:* Colorless to yellow (Mustard) – Colorless to brownish (Lewisite)

*Odor:* Mustard = Garlic or horseradish – Lewisite = Geraniums

*Symptoms:* Symptoms include: Gritty irritation and reddening of eyes, reddening of skin initially (blisters later), severe itching, nausea, vomiting, death (symptoms for Lewisite more immediate – Symptoms for Mustard may not be present until 2-24 hours after exposure).

*Persistency:* One day to several months (some vary with weather)

*Note:* All are heavier than air and need immediate Decon

### Choking Agents

*Physical State:* Chlorine = Gas or liquid – Phosgene = Gas – Diphosgene = Liquid

*Color:* Colorless (Chlorine sometimes a yellow/greenish cloud)

*Odor:* Chlorine = Like a pool smell – Phosgene = New mown hay or green corn

*Symptoms:* Initial symptoms upon exposure include: Irritation of eyes and respiratory tract, tightness in chest/difficulty breathing, nausea, vomiting, etc. (later symptoms may not occur from 2-24 hours, including shortness of breath, coughing, headache, pulmonary edema, death).

*Persistency:* Not Persistent – Highly Volatile

*Note:* All are heavier than air

***Other Chemicals:***

*Note:* *There are thousands of Haz Mat "Toxic Industrial Chemicals" common to any city that may be a high probability terrorist target. Know your common Haz Mats (i.e. Anhydrous Ammonia, Chlorine, Hydrogen Cyanide, Hydrochloric Acid, Sulfuric Acid, Methyl Chloride, LPG, LNG, etc.).*

## BLOCK DATA SHEETS - *About "Toxic Industrial Chemicals/TIC" as WMD*

It is very likely that a terrorist may choose to use a more readily available source for a WMD—Toxic Industrial Chemicals (TICs) used to cause significant casualties. Three examples of potential TICs are provided below that are readily available in communities; other TICs may also be used.

**Anhydrous Ammonia (non-household):**

- Dissemination—Liquid or gas
- Availability—Commercially available; used for household cleaning, plant growth, making of fertilizer, and metal treatment operations
- Volatility—Non-persistent, meaning it rapidly disperses after its release and only poses immediate, short-duration hazards (e.g., hours)
- Vapor density—Lighter than air depending upon dispersal method. Most of the volume occupied by gas is empty space. This accounts for the lower density of gases compared to liquids or solids. Gas particles tend to travel at high speeds in random directions
- Odor—Very sharp, irritating, pungent odor, similar to cat urine
- Routes of entry—Inhalation, ingestion, or absorption
- General signs and/or symptoms—Severe burns, coughing, nose and throat irritation, blindness, lung damage, and death. Onset of signs/symptoms usually occurs within four hours

**Chlorine:**

- Dissemination—Liquid or gas
- Availability—Commercially available; used in plastic, solvents, and pesticides, and as a disinfectant in water treatment
- Volatility—Non-persistent, meaning it rapidly disperses after its release and only poses immediate, short-duration hazards (e.g., hours)
- Vapor density—Vapor is heavier than air; liquid is slightly soluble in water
- Odor—Strong, offensive bleach smell
- Routes of entry—Inhalation, ingestion, or absorption
- General signs and/or symptoms—Burns or blisters on the skin from liquid exposure; burning of the eyes, difficulty breathing, nausea and dizziness, congestion and coughing from vapor exposure; tissue swelling from ingestion. Onset of symptoms usually occurs within minutes of exposure

## **BLOCK DATA SHEETS** - *About "TICs" as WMD (cont.)*

**Hydrogen Cyanide:**

- Dissemination—Liquid or gas
- Availability—Commercially available; used in fumigation to eliminate rodents and/or insects and as a precursor for the production of cyanide salts
- Volatility—Non-persistent, meaning it rapidly disperses after its release and only poses immediate, short-duration hazards (e.g., hours)
- Vapor density—Vapor is lighter than air; liquid is soluble in water
- Odor—Bitter almond scent
- Routes of entry—Inhalation, ingestion, or absorption
- General signs and/or symptoms—Low to medium exposure—reddening of the skin, headaches, weakness, changes in taste and smell, irritation of the throat, vomiting, effort dyspnea, lacrymation, abdominal pain, and nervous instability; high exposure—rapid death. Onset of symptoms will usually occur within seconds depending upon dosage received

Toxic Industrial Chemicals (TIC)/Toxic Industrial Materials (TIM) are chemical agents that, under certain circumstances of exposure, can cause harmful effects to living organisms. There are many sources where these chemicals/materials can be found.

- TIC/TIM sources include:
    - Chemical manufacturing plants
    - Food processing, storage facilities with large anhydrous ammonia tanks, and chemical transportation assets
    - Gasoline, LPG, LNG and jet fuel storage tanks at distribution centers
    - Airports, and barge terminals with compressed gasses in tanks, pipelines, and pumping stations
    - Industries in which cyanide and mercury compounds are used
    - Pesticide manufacturing and supply distributors
    - Educational, medical, and research laboratories

## BLOCK DATA SHEETS - *Explosive Detection Considerations*

*The "Obvious"* If something blows up – It's a basic clue that there was an Explosion!
BUT: Is there be a secondary device? Is it a RDD? Is it a Chem/Bio Bomb?

*COMMERCIAL Explosive Clues:*
Energetic materials may have a manufacturer's name on it (call them on a hard line).
There may be an obvious name (Dynamite) or trade name (Kinepax).
There may be a part of an explosive label or marking (Dangerous - High Explosives).
Color may help (e.g. Nitroglycerin is clear to amber. If discolored - beware!).
The form (shape, size, etc.) of the material may help (e.g. fuse, Det-a-Sheet, etc.).
The material (plastic, wood, metal, etc.) may help (e.g. wax-paper stick of Dynamite).
If fire fully involves an "Explosive" truck or building – DO NOT FIGHT THE FIRE!
Other Clues:

*MILITARY Explosive Clues:*
Color Codes may be a useful Military Ordnance clue (BUT color coding has changed over the years, discoloring occurs, etc.) – Some common 709B U.S. Colors: Yellow = High Explosive, Brown = Low Explosive, Green = Toxic, etc.
Markings (e.g. "Smoke") may be stamped or painted on the surface of the ordnance.
There are obvious forms (shapes & sizes) of grenades, shells, mines, bombs, etc.
There are many types of bomb fuses (like mini bombs on nose or tail) – Stay away!
Material may indicate type of ordnance (e.g. C-3 is a yellowish plastic explosive).
What looks like a "Shape Charge" attached to a LPG tank, chlorine cylinder, etc.
Other Clues:

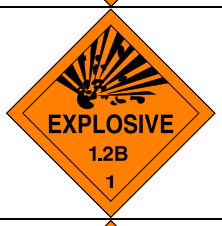
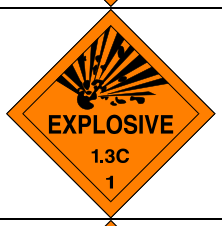
*IMPROVISED Explosive Clues:*
Anything, incl. devices modified from commercial or military explosives above!
A pipe with ends capped, but a wire or fuse sticking out of it, is an obvious clue.
A letter/package with no return address, excess postage, stains, chemical odor, etc.
A trip wire at a common ingress or egress path (or any kind of funny looking wire).
A funny looking briefcase, box, container, flowerpot, flashlight, switch, appliance (e.g. refrigerator), satchel/backpack, book, extinguisher, spray bottle, etc.
Unnatural/disturbed soil or vegetation (e.g. loosened earth concealing a bomb).
Chemicals, blasting caps, match heads, flashbulbs, PVC pipe, etc., as "bomb stuff."
Maybe the Only Clue: Gut Feeling (*Something may not look right*) Common Sense!

*Bomb Threats:*
There are increasing numbers of (valid & hoax) bomb threats (some by terrorists).
Most bomb threats are communicated by telephone or mail, for a variety of motives.
For a phone threat, write down key info (time, date & exact words of caller) + other questions as possible (time of explosion, location and description of bomb, etc.)
For a suspicious letter/package, do not handle it, remember the info (names, no return address, excess postage, stains, chemical odor, etc.), clear the area & call for help.

*Your EOD Unit:* The most valuable recognition resource: BACK OFF and let the EOD Unit do its job!

*BOTTOM LINE Clue:* There may be obvious or not so obvious explosive agent clues. Improvised devices are hard to detect. Use your common sense and be vigilant of secondary devices!

**BLOCK DATA SHEETS** - *Six Class 1 DOT Explosive Divisions*

| Division | Explanation | Examples | Placard |
|---|---|---|---|
| Division 1.1 | Consists of explosives that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously. | TNT<br>Nitro-glycerin<br>Black Powder<br>Etc. |  |
| Division 1.2 | Consists of explosives that have a projection hazard but not a mass explosion hazard. | Flares<br>Detonating Cord<br>Etc. |  |
| Division 1.3 | Consists of explosives that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard. | Propellants<br>Flash Powder<br>Etc. |  |
| Division 1.4 | Consists of explosives that present a minor explosion hazard. The explosion effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion almost the entire contents of the package. | Fireworks<br>Small Arms<br>Ammo Etc. |  |
| Division 1.5 | Consists of very insensitive explosives. This division is comprised of substances which have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport. The probability of transition from burning to detonation is greater when large quantities are transported in a vessel. | Blasting Agents |  |
| Division 1.6 | Consists of extremely insensitive articles which do not have a mass explosive hazard. This division is comprised of articles which contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation. The risk from articles of Division 1.6 is limited to the explosion of a single article. | Not Otherwise Specified (N.O.S.) |  |

**BLOCK DATA SHEETS** - *Common Explosives*

| Classification | Explosive | Color | Uses | Remark |
|---|---|---|---|---|
| Low Explosives | Black Powder | Black, gray or cocoa brown | Safety fuse, muzzle loaders | Very sensitive to friction heat & shock |
| | Smokeless Powder | Light brown to black | Small arms, mortars, rockets | Very sensitive to friction heat & shock |
| Primary High Explosives | Lead Azide | White to buff gray | Detonators, priming compositions | Very sensitive to friction heat & shock |
| | Lead Styphnate | White to buff gray | Priming compositions | Very sensitive to friction heat & shock |
| | Mercury Fulminate | Light orange to reddish brown | Detonators, priming compositions | Very sensitive to friction heat & shock |
| Secondary High Explosives | Ammonium Nitrate | White but may be dyed other colors | Ingredient of many explosive mixtures | Must be kept cool |
| | C-4 | White to light brown | Plastic demolition explosive | Insensitive to impact and friction |
| | Flex-x | Any color, usually olive drab or red | Cutting charges | Flexible, waterproof, insensitive to shock |
| | Kinepak | Powder is white, the liquid is usually pink | Construction | Inert until mixed |
| | Nitro-glycerin | Clear to amber. Red fumes mean "BEWARE" | Demolition, ingredient in dynamite | Can be absorbed through skin causing headache |
| | Pentolite | White to yellow to gray | Shape charges, boosters | Presence of grit increases impact and sensitivity |
| | PETN | White unless dyed | Det cord, blasting caps, primer | Presence of grit increases impact and sensitivity |
| | Picric acid | Cream to yellow to red | Alternative filler | Dangerous when it deteriorates |
| | RDX | White but may be dyed | Det cord, blasting caps, used to make C-4 | Not used much until WWII |
| | Tetryl | Clear to yellow to gray | Booster, blasting caps | Colors skin reddish brown and causes rash |
| | TNT | Light yellow to brown to light gray | Bombs, projectiles, demolition | Standard with which all other explosives are measured |

## **BLOCK DATA SHEETS** - *Commercial Explosive Pictures*

**Blasting powder in plastic wrap**


Ammonium Nitrate Products + Fuel Oil = **(ANFO)**

**Dynamite**


**Explosives ORM**

**Blasting Caps**

## BLOCK DATA SHEETS - *Military Explosive Pictures*

**Grenades**

**Mines**

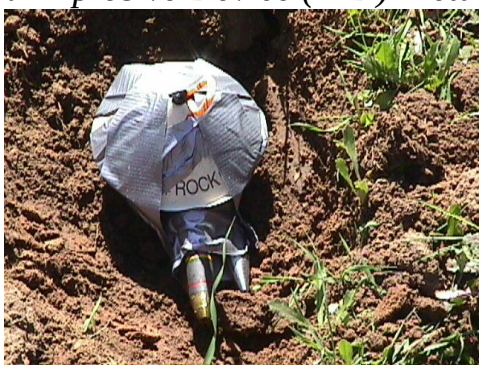
**Mortar Rounds**

**BLU-3 Sub-munition**

**C-4 Explosives**

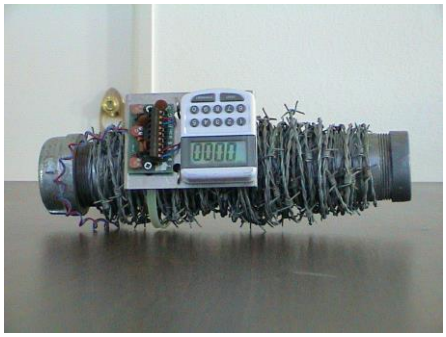
## **BLOCK DATA SHEETS** - *Improvised Explosive Device (IED) Pictures*

**Shaped Charge**



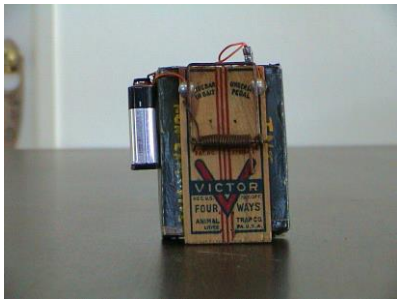

**Cylinder w/explosive**

**"Letter" box bomb**



**Pipe Bomb**

**Mouse Trap Bomb**



## BLOCK DATA SHEETS – *Recognizing Improvised Explosive Devices (IED)*

Most improvised explosives are comprised of chemical constituents easily found in any home or local community, even in large quantities.

Improvised explosives, such as military and commercial explosives, are typically mixtures of an oxidizer and a fuel. Regardless of type, all are extremely hazardous. Most improvised explosives are based on formulations used in commercial applications or research. Legitimate users do not use improvised explosives very often today. This is due to their sensitivity and unsuitability to be handled in a safe manner.

Improvised explosives can be as effective as manufactured explosives in many applications. Terrorists employ these in all sizes of devices. The following are common types of improvised explosives being utilized today by terrorists.

### *Potassium Chlorate:*

This explosive has approximately 83% of the power of TNT. Potassium chlorate is a common ingredient in some fireworks and can be purchased in bulk form fireworks/chemical supply houses. Potassium chlorate normally appears in white crystal or powder form.

### *Peroxide-Based IED:*

Peroxide-based improvised explosives are an emerging threat domestically. However, these IEDs have been a common explosive used by international terrorists for some time. Hexamethylenetriperoxidediamine (HMTD) and Triacetonetriperoxide (TATP) were initially developed 100 years ago. They are both extremely sensitive and are used as an explosive by terrorists/bombers as both an initiator (blasting cap) and as a main charge. TATP is commonly found as the main charge being employed by Middle East terrorists in suicide bombings.

HMTD has between 60-116% of the power of TNT, and is comprised of peroxide (ideally 30% or above), citric acid, and hexamine (heat tabs). TATP has 88% of the power of TNT and is comprised of peroxide, acetone, and sulfuric (battery) acid.

> **WARNING:** In dry form, HMTD and TATP could appear similar to crack cocaine. These explosives will react violently with drug field test kits. Individuals should consider, and look for, any indicators present on a drug scene that may also be indicators of explosive manufacture—this is becoming more common. If so, the investigator should consider marking the evidence as a possible explosive and sending it to their lab for testing. HMTD and TATP are ideal as explosives for improvised blasting caps, and were originally developed for such use.

# BLOCK DATA SHEETS – *Recognizing IEDs (cont.)*

### *Powdered Ammonium Nitrate and Aluminum Powder:*

Ammonium nitrate can be procured in powdered form—one example is a common cold pack. These use either ammonium nitrate in prill or powder. If ammonium nitrate is in prill form such as in fertilizer, it is a simple task to grind it into a powder. The aluminum powder can be procured at a professional paint store, or simply filed from an ingot. The explosive has 75% the power of TNT and is sensitive to friction impact, or ESD. It requires only a blasting cap for initiation.

While this is only one-half pound of explosive, consider that this mixture of readily available constituents has been used in very large devices. In 1997, there were three apartment complex bombings in Moscow and each consisted of ammonium nitrate in amounts equivalent to 500 pounds of TNT. The devastating effects from each of those devices resulted in over 100 casualties per incident.

### *Urea Nitrate:*

Urea nitrate is also considered a type of fertilizer-based explosive, although, in this case, the two constituents are nitric acid (one of the ten most produced chemicals in the world) and urea. A common source of urea is the prill used for de-icing sidewalks. Urea can also be derived from concentrated urine. This is a common variation used in South America and the Middle East by terrorists. Often, sulfuric acid is added to assist with catalyzing the constituents. A bucket containing the urea is used surrounded by an ice bath. The ice serves in assisting with the chemical conversion when the nitric acid is added. The resulting explosive can be blasting cap sensitive. Urea nitrate has a destructive power similar to ammonium nitrate.

### *Hypergolic Devices:*

Some improvised explosives are hypergolic in nature. This means when two particular chemical constituents are brought together they can violently react with each other, with the surrounding atmospheric temperature often being the catalyst; they are highly unstable and unpredictable. This reaction will result in either an incendiary effect or an explosion. An example is sulfuric acid (oxidizer) and sugar (fuel) in a Styrofoam cup. The acid slowly eats through the Styrofoam and mixes with the sugar, causing a hypergolic reaction within seconds and resulting in an explosion.

### *Preparing Improvised Explosives:*

- Commercial coffee grinders are very effective for the process of grinding.
- Grist Mills for the crushing of barley or wheat are also effective. A ton of material can be processed through one this size in about two hours. Consider how terrorists might access such a machine.
- Odd job mixers or even a concrete mixer would be suitable for the mixing of the ammonium nitrate and the liquid fuel.

## BLOCK DATA SHEETS – *Recognizing IEDs "Components"*

Improvised Explosive devices (IEDs) generally consist of four components—power source, initiator, explosive, and switch. An additional component or part of the IED may include fragmentation and shrapnel. These components can be easily remembered by the acronym PIES(F). Each of the components is briefly discussed below.

- *Power sources*—The majority of IED contain an electric initiator and, as such, require an electric power source. Batteries (a common power source) are manufactured in numerous shapes and sizes; in some cases, they can be cut and shaped to make detection more difficult. Most commercially available batteries can reliably cause an initiator to function. Mechanical action, such as a spring under pressure, can store sufficient energy to cause the functioning of a non-electric initiator

- *Initiators*—Blasting caps or flame-producing components like fuse igniters for a length of time fuse. Improvised initiators causing low explosives or highly sensitive high explosives to detonate can easily be made. Examples of improvised initiators include a modified flash bulb, a percussion primer, or even improvised hobby fuses that impart flame much as time fuse, only at an uncontrolled burn rate. Initiators can also be improvised for high explosives. An example is an improvised blasting cap. Triacetone triperoxide (TATP) is a formulation used in improvised initiators

- *Explosives*—Have previously been discussed. However, as an IED component, explosives have a few additional characteristics that warrant discussion. When an explosive is incorporated into a device, it is not necessarily in contact with all other IED components. Often, these components will survive in some form after a device detonates. Recognize there is always evidentiary debris at a post-blast incident

- *Switches*—Incorporated into a device as either an arming switch or a fuse. They can be simple or complex in nature. More than one switch can be used to create redundancy in the system. Many IEDs will incorporate both an arming switch and a fusing switch. The arming switch is a safety for the IED and works by disarming (electrically disengaging) the fusing switch. When the arming switch is armed the fusing switch becomes functional; however, the circuit is still closed. When the fusing switch is activated, the circuit becomes open and will connect battery power to the initiator (blasting cap)—detonation will occur. Switches are almost unlimited in design and constructed so any approach or action by its intended target or a first responder will result in detonation. Switches specifically for IEDs can take on any form and can appear quite innocent looking—completely fitting into the environment

- *Fragmentation and shrapnel*—Part of the IED, wherein materials are added to the device for inflicting maximum casualties. Examples include ball bearings, nails, BBs, etc

## BLOCK DATA SHEETS – *Recognizing Phone Threats*

Dispatchers (FRAs) and fire and law enforcement personnel (FROs) may receive a phone threat. Whoever you are, if you receive a phone threat (NBC or Bomb Threat), your actions may be key to "recognizing" if the threat is credible or not, as well as providing valuable information to other responders. First, stay calm and keep the caller talking as long as possible. Record the time and date reported and, if possible, the exact words of the caller. Let your supervisor know but stay on the telephone with the caller. It is also helpful to try and determine the type (gender, age, etc.) and tone (calm or excited, recognizable, distinguishing speech characteristics, etc.) of the caller. Background noise (music, traffic, aircraft, voices, etc.) may also be useful information. If you can't record the exact words, using and completing a "checklist" like the sample provided below can help you keep focused on the key questions that will help your supervisor and officials determine the validity of the threat. Modify this checklist to meet your specific needs, but have some key questions in mind if the threat is communicated by phone. Keep the checklist of questions handy, perhaps on a brightly colored sheet. The **LAST QUESTION TO ASK IS "WHO ARE YOU"**? This usually prompts a hang up.

**Checklist of Questions (Short Form):**

- What kind of device is it?
- When will it go off?
- Where is the device right now?

**Checklist of Additional Questions (Long Form):**

- Ask the caller what does it look like?
- Ask the caller why he/she placed the device?
- Ask the caller what is the triggering mechanism?
- Ask the caller what can be done to stop the explosion?
- Ask if the caller if he/she is from a "group" or organization?
- Ask the caller where he/she is calling from?
- Ask the caller who he/she is?

Note the time the caller hung up, your name and any other important remarks. You may be able to use "Caller ID" or "*57 Security Feature." Check your agency SOP regarding a phone threat. *If you/your agency feels the threat is valid – Don't forget **S**afety, **I**solation & **N**otification guidelines noted in FRO WMD Block D1.* You should dial 9-1-1 and notify law enforcement.

## BLOCK DATA SHEETS – *Recognizing Mail Threats (suspicious letter or package)*

Any one of the indicators below may be helpful in recognizing a suspicious package or letter bomb. One or more indicators may not, in and of itself, mean the item is a credible mail threat. However, if you feel the item does not look right or is questionable, and some of these indicators are present (especially a critical indicator*), then treat the item as suspicious. Do not handle the package/letter. These items may be triggered by movement, opening, or a timer. It does not have to be large to be deadly. Here are some "Indicators" of a suspicious package/letter:

- __Package or letter contains some form of an articulated threat*
- __Package or letter contains a powder or liquid not easily explained or unusual*
- __Exposed wires or metal foil visible, bulges in package*
- __Too much postage (particularly with stamps – not metered mail)*
- __Does not have a clear return address or no return address*
- __Written return address/zip code does not match or correspond to postmark*
- __Stains on the package or the package is "wet" in spots*
- __Unusual smell, chemical odor or unusual container (fabric bag or wrapping)*
- __Marked to be opened by "Addressee Only" or "Confidential"*
- __Handwritten, poor penmanship, misspellings, incorrect title*
- __Package is sent from out of country*
- __Package has a large amount of tape on it/more than 6 mm thick*
- __Is tied with excessive twine, rope or string*
- __Scotch tape used to seal envelope
- __Package well wrapped such as multiple layers of wrapping paper
- __Is from a hostile person or group
- __The recipient, addressee or site is a likely target
- __The recipient, addressee or site has had past domestic or labor/management problems
- __The recipient, addressee or site has received past threats
- __Sender is an employee recently terminated or suspended
- __Shipper or sender did not ship or send the package
- __Package is heavy for its size or unbalanced/more than 2 ounces
- __Metallic or sand like sound or items loose inside package
- __Looks out of place or in an unusual place (does not fit surroundings)
- __Does not belong to anyone (particularly if in odd location)
- __Unexpected package or mail, or the item was not ordered
- __Is too light for its size (large package may conceal device)
- __Package or letter "just appears" on a desk or other location
- __Unknown method of delivery
- __Delivered by a person who is not the normal delivery person
- __Looks like it has been opened and resealed or tampered with
- __Just looks "suspicious" or "does not look right"

Check your agency SOP regarding a suspicious package or letter item. If you/your agency feels the mail threat is valid – Don't forget Safety, Isolation & Notification guidelines noted in FRO WMD Block D1. You should dial 9-1-1 and notify law enforcement.

## **BLOCK DATA SHEETS** – *IDHA Considerations*

*"IDHA":* "Identification and Hazard Assessment" (IDHA) is the key to a hazardous materials response. But in reality, the WMD/NBC+E first responders and Incident Commanders will be primarily driven by "Recognition Clues" for some time into the incident (positive IDHA, and turning information into "Intelligence," will usually take some time – after the specific agent has been positively identified). The five step IDHA process for Haz Mat has some general applicability to WMD/NBC+E (note example via chemical nerve agent "VX" applied to the 5 steps):

1. Identify Chemical Name (e.g. Chemical Nerve Agent Type "VX")
2. Assess All Hazards:
   - Health/Toxicity/Contamination (high)
   - Fire (low)
   - Reactivity (low)
   - Secondary devices (always be vigilant for this)
   - Panic/Chaos (high tempo event), etc.
3. Assess Physical, Chemical & Toxicological Properties:
   - Volatility (low)
   - Persistency (high)
   - Vapor Density (hangs low in air)
   - Toxicity (high – IDLH .0018 ppm), etc.
4. Assess Variables/Modifying Conditions:
   - Temperature (good day = low temperature – bad day = high temperature)
   - Precipitation (good day = rain – bad day = no rain)
   - Wind (good day = high 20+ mph winds – bad day = 0-light steady winds)
   - Terrain (good day = hills & grass – bad day = flat sparse terrain), etc.
5. Predict behavior/outcome:
   - Physical characteristics (VX as liquid or aerosolized?)
   - Initial air dispersion (0-30 seconds - determined by delivery system)
   - Subsequent dispersion (30+ seconds – determined by weather, terrain, etc.)

## **BLOCK DATA SHEETS** – *Intelligence & Risk vs. Gain Considerations (cont.)*

*Info Sources:* There are several "open/non-classified" sources of information regarding "Identification And Hazard Assessment" of NBC+E weapons. Efforts by the FRO and IC to obtain, read and understand these sources BEFORE the WMD Incident on a routine/on-going basis will be very helpful to the FRO and IC in recognizing and safely dealing with NBC+E weapons. Here are just a few key information sources:

- Emergency Response Guidebook
- Material Safety Data Sheets for some agents (i.e. GB, Chlorine, Mustard, etc.)
- FEMA's Transport of Radioactive Materials
- Jane's Chem Bio Handbook
- FEMA & DOJ's Emergency Response to Terrorism Job Aid
- Explosives Identification Guide (Mike Pickett), etc.

*"Info" vs. "Intelligence"* "Info(rmation)" may or may not be plentiful at a WMD event. However, info may often be incomplete, inaccurate and/or conflicting. What is needed to make sound decisions at the incident is "Intelligence," which is information that is:

1. Verified (by at least 3 sources like the ERG, MSDS, CHEMTREC, etc.)
2. Prioritized (per life/health, crime scene, environment & property, in that order)
3. Organized (into any user friendly format that can be used in the field)
4. Analyzed (by those with expertise like a Haz Mat Team, FBI DEST, etc.)
5. Made Useful (for Responders to make decisions and take actions in the field)

*"Risk" vs. "Gain"* Many decisions and actions at a WMD event will be made based on limited recognition clues (without valid IDHA or Intelligence). The FRO and IC must have a process for decision making in the field. One such process is a 5 step Risk vs. Gain that can be made quickly before making any critical decision or difficult action:

1. Identify GAINS (per life/health, crime scene, environment & property)
2. Identify RISKS (per life/health, crime scene, environment & property)
3. Identify Level (FRA, FRO, Tech or Spec), Resources & Capabilities)
4. Assess overall SAFETY (how unsafe is it?)
5. Assess overall VIABILITY (will it work?)

If GAINS outweigh risks – GO! - IF RISKS outweigh gains – NO GO!

REMEMBER: The FRO & IC will initially be driven by recognition clues at a WMD incident!

## BLOCK SUMMARY SHEETS

*Caution:* Responders may not recognize the incident to involve Nuclear, Biological, Chemical or Explosive weapons, and as a result, take immediate actions that will trip an explosive device, contaminate the responders, spread the contamination, and/or cause the responders to become victims themselves (especially a "Chemical" agent incident, which will look much like a mass casualty incident).

*Haz Mat Clues:* Some "Haz Mat NFPA" recognition clues may help, such as Occupancy/Location (target like city hall), Container Shapes (dispersion device, pipe bomb, etc.), Markings & Colors (trefoil marking, military ordnance color code, etc.), and Senses (common sense). But others like Placards and Labels, Shipping Papers and Material Safety Data Sheets will not likely be provided, or immediately available, to first responders on the scene by the not so courteous terrorist.

*Basic Clues:* The "Big 10/Stop, Look & Listen" recognition clues for NBC+E can help, such as:

1. **Physical State** – Phosgene is a gas (Nerve Agents are not)
2. **Color** – Most Nerve Agents are colorless, but VX can look slightly amber
3. **Odor** – Lewisite smells like geraniums and Arsine smells like garlic
4. **Signs & Symptoms** – Miosis is a common symptom of a Nerve Agent
5. **Mass Casualties Next to Target Site** – May be the "Smoking Gun" clue
6. **Low Lying Clouds or Mists** - Low lying Chlorine gas cloud in a mall
7. **Dispersion Devices** – Makeshift sprayer is found near the site
8. **Unusual Surrounding Factors** – Like dead animals/vegetation, large swarm of insects, suspicious package, metal/bomb debris, landmark, date/April 19, etc.
9. **Eye Witness Reports/Credible Threat** – Smells like garlic (you're not in Gilroy) or a "Theoretical, Operational & Consistent" valid report or threat
10. **Common Sense/Gut Feeling/Obvious Clue** – Something doesn't look right (may be your only clue of an NBC+E incident) or an obvious bomb/explosion!

## **BLOCK SUMMARY SHEETS** (cont.)

*WMD Clues:* NUCLEAR (Primary clue is properly working rad monitors):

1. Source – Trefoil marking or med waste label still on source
2. RDD – Low/Soft/Dud type explosion with no apparent damage
3. Weapon – Projectile/bomb like shape or pick-up Alpha readings close to source

BIOLOGICAL (Primary clue will be cluster epidemic picked up by Health officials):

1. Bacteria – Valid and suspicious letter
2. Virus – Unusual swarms of insects not common to area
3. Toxins – Most biologicals have 1 to several day incubation periods, but Ricin may show symptoms within 24 hours

CHEMICAL (Primary clue will be sudden onset of similar symptoms next to target site):

1. Nerve – Sudden onset of similar symptoms like miosis, twitching, salivation, etc.
2. Blood - Sudden onset of similar symptoms like red lips, convulsions, etc.
3. Blister - Similar symptoms like red skin, eye pain, severe itching, etc.
4. Choking - Similar symptoms like eye and lung irritation, chest pain, etc.
5. Irritating - Immediate symptoms like tearing, coughing, etc.

EXPLOSIVE (primary clue will be an explosion or bomb like/unusual looking device):

1. Commercial Energetic Materials – Manufacturer, Color, Markings, Form, etc.
2. Military Ordnance – Color, Markings, Form, Fuse, Material, "Bomb Like," etc.
3. Improvised "Explosive" Devices/IEDs – Unusual Device/Form, Trip Wires, etc.

*IDHA &. Intelligence* Valid IDHA and Intelligence will usually become available later in a WMD event. Know and use the processes provided, but realize that your decisions and actions will be driven by recognition clues, as well as a "Risk vs. Gain" process!

*A Mind Jogger:* PREPARATION: Need to develop an N+B+C+E Recognition Clue "Mind Jogger" via a recognized Nuclear, Biological, Chemical or Explosive weapon clues "Matrix." *(or research and develop your own "Quick Reference" recognition and info sheets)* RESPONSE: Need to get "N+B+C+E Recognition Clues" into your head (keep studying the clues - You may not have time to use a matrix during an emergency)!

*Bottom Line:* FROs will be driven by "Recognition Clues" in the initial phase of a WMD/NBC+E incident (positive IDHA & Intelligence will usually come later). ***Know your N+B+C+E Recognition Clues/Indicators (if you don't, you may become part of the problem or a victim) – YOUR FIRST JOB IS TO RECOGNIZE N+B+C+E!***

# BLOCK ISSUES SHEET

Focus on **K**ey **R**esponse **I**ssues (**KRI**) in every Block of Instruction!

Here are some ideas for this block (Pick one, rank them or select your own **KRI**):

- ☑ What general Haz Mat recognition clues can I use for NBC+E incidents?
- ☑ What specific new NBC+E indicators can I use to recognize each type of NBC+E?
- ☑ Are the monitoring devices I can use for NBC reliable and well maintained?
- ☑ What initial clues, if any, can I use for a Nuclear incident?
- ☑ What clues can I use for a Biological incident to validate it as a hoax?
- ☑ Do I have a good handle on the immediate symptoms that indicate a Chemical incident?
- ☑ In absence of an obvious bomb/blast, what are key indicators for an Explosive incident?
- ☑ What general "IDHA" information can I be aware of before a WMD/NBC+E incident?
- ☑ **Do I have an N+B+C+E Recognition Clue "Mind Jogger" that will help me in the field?**

*Your **K**ey **R**esponse **I**ssue (**KRI**) for this block is?*

_____

_____

_____

_____

_____

_____

# BLOCK ACTIVITY SHEET

*(INSTRUCTOR MAY SELECT ONE OR MORE OF THE FOLLOWING ACTIVITIES):*

*ACTIVITY A.* Within your group, or as individuals, list at least one specific clue and symptom for each type of NBC+E agent/weapon. Be prepared to provide your list to the class.

*ACTIVITY B.* Given a "fictitious" N, B, C or E scenario(s) by the instructor, use an N, B, C or E Recognition Matrix to determine the specific agent/weapon used. Be prepared to provide a report to the class and to defend your findings.

*OTHER ACTIVITY:*

# BLOCK WORK SHEET

- List the "**NFPA Recognition Clues**" for Haz Mat & put an X next to those that apply to NBC+E:
  1. _____ _____
  2. _____ _____
  3. _____ _____
  4. _____ _____
  5. _____ _____
  6. _____ _____

- List the 3 "**Primary Recognition Clues**" for an NBC+E incident:
  - ✓ Nuclear:
  - ✓ Biological:
  - ✓ Chemical:
  - ✓ Explosive:

- List at least 3 other "**Basic Recognition Clues**" that may indicate an NBC+E incident:

- List at least 1 specific "**clue/indicator**" for each "**Type**" of NBC+E Agent/Weapon:

❖ Nuclear Type Clues/Indicators:
- ✓ _____ - _____
- ✓ _____ - _____
- ✓ _____ - _____

❖ Biological Type Clues/Indicators:
- ✓ _____ - _____
- ✓ _____ - _____
- ✓ _____ - _____

❖ Chemical Type Clues/Indicators:
- ✓ _____ - _____
- ✓ _____ - _____
- ✓ _____ - _____
- ✓ _____ - _____
- ✓ _____ - _____

❖ Explosive Type Clues/Indicators:
- ✓ _____ - _____
- ✓ _____ - _____
- ✓ _____ - _____

- In your own words, describe the "**primary problem**" if you do not recognize the NBC+E incident:

# D1

## *California Specialized Training Institute*

**Block Title:** WMD/NBC+E "First Responder" Actions

**Class:** Hazardous Materials: FRO–WMD

**Block Scope:** Instructor to cover the following: Briefly note first responder response considerations (i.e. agency coordination, ICS, mass casualty implications, decon requirements, etc.). Describe first responder actions upon discovery of an incident that potentially involves NBC+E weapons. Identify sources of assistance and/or information to employ in such incidents, including the current Emergency Response Guidebook (ERG). Identify basic actions to follow for each general type of NBC+E weapon. Develop a "personal mind jogger" for initial priority "FRO" response actions to an NBC+E incident.

**Block Main Points:** Block Purpose & Focus
- Basic First Responder Considerations
- Response Actions – The Questions
- Response Actions – The ERG
- Response Actions – "S.I.N.C.I.A.P.C.P.D.D.D."
- Response Actions – The "NBC+E" Reality
- Response Actions – Your "NBC+E" Mind Jogger
- Wrap-up, Issues & You

**Support Material:** *See Block Note Sheet/Outline, Data Sheets, Issue Sheet, Activity Sheet and Work Sheet on following pages*

**Additional References:** *See Appendix E (NBC+E Bibliography) for further references as needed*

**Time Recommended:** 60 to 90 Minutes

# Block D1

## *NBC+E "First Responder" Actions*

## Main Points

- Block Purpose & Focus
- Basic First Responder Considerations
- Response Actions – The Questions
- Response Actions – The ERG
- Response Actions – "S.I.N.C.I.A.P.C.P.D.D.D."
- Response Actions – The "NBC+E" Reality
- Response Actions – Your "NBC+E" Mind Jogger
- Wrap-up, Issues & You

# BLOCK NOTE SHEET/OUTLINE

- **Block Purpose & Focus**
  - ▶ Purpose
  - ▶ Focus

- **Basic First Responder "Considerations"**
  - ▶ OSHA FRO Level Keys = Initially Respond (to protect life/health, environment & property) in a DEFENSIVE (response mode)!
  - ▶ NOTE: Other WMD/NBC+E Response Agencies:
    - Local: Fire, Law Enforcement, EMS, PW, Health, HMT, EOD, OES, etc.
    - State: CDF, CHP, EMSA, DHS, CSTs, State OES,
    - Federal: FBI, ATF, DHHS, CDC, DOD, DOE, FEMA, etc.
    - Others: Industrial Haz Mat Teams, Poison Control Centers, ARC, etc.
    - NOTE: Need to Coordinate with All Agencies Arriving On-Scene!
  - ▶ "SEMS" & The Use of "ICS" in the Field of a WMD/NBC+E Incident:
    - SEMS (Standardized Emergency Management System) Overview
    - ICS = Incident Command System (required to be used in the field by SEMS)
    - NOTE: Purpose/Function & Structure of ICS
    - The "First" FRO's Role (and Other FRO Roles) in ICS
  - ▶ NOTE: Other First Responder Issues:
    - Need to Understand Mass Casualty Implications
    - Need to Understand Decon Requirements
    - Need to Balance Priority Lifesaving Activities with Evidence Preservation
    - Need to Determine & Call for Additional Resources
    - Need to Know "Realistic" Initial Priority Response Actions, etc.

- **Response Actions – The Questions**
  - ▶ Are You Dead Yet?
    - Keep Upwind, Upgrade & Upstream
    - Use SCBAs or Keep a Safe Distance, etc.
  - ▶ Are They Dead Yet?
    - Avoid Contamination – Direct Self Decon
    - Help Salvageable "Deconned" Victims, etc.

- **Response Actions – The ERG**
  - ▶ WMD/NBC+E Info in the ERG
  - ▶ May Use Current ERG:
    - Nuclear – Guide Page 163
    - Biological - Guide Page 158
    - Chemical - Guide Page 153 or . . .
    - Explosives - Guide Page 112 or . . .

- **Response Actions – "S.I.N.C.I.A.P.C.P.D.D.D."**
  - ▶ May Use "CSTI Haz Mat FRO" Acronym (If Applies to NBC+E?):
    - **S** = Safety
    - **I** = Isolate & Deny Entry
    - **N** = Notify
    - **C** = Command
    - **I** = Identification & Hazard Assessment
    - **A** = Action Plan (Risk. vs. Gain)
    - **P** = Protective Equipment
    - **C** = Countermeasures (FROs = Defensive Containment)
    - **P** = Protective Actions
    - **D** = Decontamination
    - **D** = Disposal
    - **D** = Documentation

- Other Unique NBC+E Actions/Considerations:
  - Nuclear – Time, Distance & Shielding, etc.
  - Biological – Delayed Symptoms, Hygiene, etc.
  - Chemical – Sudden Symptoms, Emergency Mass Decon, etc.
  - Explosives – Observation, Barriers, Radio Use, Rally Points, etc.

## • Response Actions – The "NBC+E" Reality

- The NBC+E Response Priorities:
  - Life & Health (incl. responders)
  - Crime Scene Preservation
  - Environment
  - Property
- The NBC+E Response Realities:
  - May be Lots of Confusion & Conflicting Info
  - May be Lots of Victims & Problems
  - May be Very Few Responders & Resources
- NOTE: FROs Can Only Take a Few Initial Priority NBC+E Actions!
- Consider These "Top 5" Initial Priority NBC+E Actions:
  - **S** = Safety (self-protection)

    Stay "Upwind, Upstream & Upgrade" - At a Safe Distance
  - **I** = Isolate & Deny Entry (via safe distance perimeter)

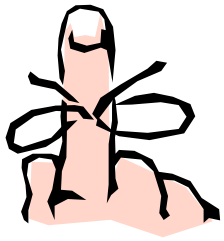
    Attempt to Control the Scene as Best As Possible

    Start to Control Entry/Access Points,

    Use a Firm & Calming "PA" Message, etc.
  - **N** = Notify (FBI, ATF, EOD, etc., + other needed resources via safe route)
  - ***D*** *= Depends on N, B, C or E:*
    - *Nuclear = Determine Rad Levels via Rad Survey Meters*
    - *Biological = Determine/Document Impacted Public & Give Calming Info*
    - *Chemical = Determine Need for Immediate Mass Emergency Decon*
    - *Explosives = Determine Need for Immediate Evacuation & Rescue*
  - **I** = Investigation (Observe "Crime Scene" Rules)

- **Response Actions – Your "NBC+E" Mind Jogger**
  - ▶ What's an Acronym? – A Mind Jogger!
  - ▶ Develop Your Own Acronym/Mind Jogger for:
    - *Nuclear* Initial Priority FRO Response Actions
    - *Biological* Initial Priority FRO Response Actions
    - *Chemical* Initial Priority FRO Response Actions
    - *Explosives* Initial Priority FRO Response Actions

- **Wrap-up, Issues & You**
  - ▶ Block Key Point Summary
  - ▶ Block Key Response Issues:
  - ▶ Your Issues/Questions



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***"You will only be remembered for two things:***
***The problems you solve or the ones you create."***
*(Mike Murdock – 101 Wisdom Keys)*

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## BLOCK DATA SHEETS - *FRO Basic "Response" Action Considerations*

*The OSHA FRO:* Per the strict interpretation of OSHA definition for First Responder OPERATIONS (FRO) – The FRO responds in a "DEFENSIVE" manner. If a responder is to be in the hazard area/exclusion/hot zone, they should have:

1. *Appropriate PPE per the hazard exposure, and*
2. *Appropriate training in the operations undertaken*

Usually in a WMD/NBC+E event, FROs will NOT have the appropriate PPE or training to go OFFENSIVE. There may be some exceptions for a quick rescue attempt in a "N" or "B" WMD event (see page 13), depending on a "Risk vs. Gain" assessment, numbers of victims, resources and capabilities on-scene, etc. Per OSHA, FROs will be limited to DEFENSIVE actions on-scene.

In reality, the FRO's initial "Defensive" actions will be limited, and be different, depending on the specific nature of the N, B, C or E weapon present (see page 16). The FRO will be severely challenged at the start of a valid NBC+E incident, requiring a "Mind Jogger" to get him/her through the initial chaotic phase of the incident (see page 17). A FRO should always be vigilant to "Secondary Devices," think "Safety," and use "Common Sense." A FRO should also have a "Risk vs. Gain" process (see page 17) before taking actions beyond the "Defensive" mode.

## BLOCK DATA SHEETS - *The Other WMD "Responders"*

*Responders:* There are many "Response" agencies to a WMD incident from local, state and federal governments (and the private sector). Most "First Responders" will come from local agencies. However, there are many more agencies that will eventually arrive to a valid WMD event. FROs should be aware of the key WMD agencies.

*Local FROs:* Some key local first responder agencies include the Fire Department, Police or Sheriff's Department, EMS, Haz Mat Team, Explosive Ordinance Disposal unit, Public Works, Hospitals, County Health, etc. Other local agencies that may later become involved in the incident include City/County OES, Social Services, City/County Counsel, City/County Parks, County Ag, etc.

*State FROs:* Some key state first responders include CDF, CHP, Cal Trans, etc. Some other state response agencies include DHS, DTSC, EMSA, Cal National Guard Civil Support Teams, Office of Homeland Security, State OES, etc.

*Fed Agencies:* Some key federal first responders (within a few hours from the local office) include FBI, ATF, USCG , EPA, CDC (via phone contact), DOD, DOE, etc.

*Other Agencies:* Note that many local private sector resources/agencies/non profit groups may respond, such as industry Haz Mat teams, American Red Cross, Salvation Army, Poison Control Centers, Chemists, Labs, Terrorism Working Groups, etc.

*The Key Need:* The key need/issue for all responders is to coordinate their response. FROs, who by their nature are first on-scene to witness the event, can help with coordination by understanding both the key WMD response agencies and their primary roles and responsibilities. This can be done before an emergency by joint planning, training, and exercising. It also helps to understand the Standardized Emergency Management System (SEMS) and to use the Incident Command System (ICS).

## BLOCK DATA SHEETS - *ICS OVERVIEW*

*SEMS & FROs:* SEMS was first created when the state legislature passed SB 1841 in 1992. It was codified into CGC 8607, and requires a "Standardized Emergency Management System" for any emergency or disaster (including WMD) involving two or more agencies. State agencies must use SEMS, and local agencies (including FRO agencies) are "encouraged" to use SEMS (reimbursement after a declared disaster is dependent on the use of SEMS).

*Purpose:* The general intent/purpose of SEMS was to facilitate information flow, coordination between response agencies, and a more rapid mobilization of resources. In short, it was a comprehensive attempt to coordinate all response agencies at the local and state level. SEMS incorporates the following:

*Components:*
1. The use of the principles of the Incident Command System (ICS)
2. The use of the concept of multi agency coordination
3. The use of the existing Master Mutual Aid Agreement
4. The use of the "Operational Area" concept
5. The use of the Operational Area Satellite Information System (OASIS)

*Levels:*
1. The "Field" level (where most emergencies are handled)
2. The "Local EOC" level (city or unincorporated county area)
3. The "Operational Area EOC" level (usually the county)
4. The "Regional EOC" level (one of three State OES Regions)
5. The "State EOC" level (State OES Headquarters)

*Functions:*
1. Command & Management
2. Planning & Intelligence
3. Logistics
4. Finance & Administration
5. Operations

*SEMS & ICS:* SEMS will apply to any type of WMD/NBC+E incident, requiring the use of ICS in the field (at an Incident Command Post/ICP), and the probable activation of all levels of Emergency Operation Centers (EOCs). So what does ICS mean to the FROs?

## BLOCK DATA SHEETS - *ICS OVERVIEW (cont.)*

*ICS & FROs:* ICS is defined as an organized system of roles, responsibilities and standard operating procedures to direct and *manage* emergency operations. ICS functions as an emergency management system that stresses a coordinated team approach. ICS starts with the position of Incident Commander (IC). The first person/unit on scene (that means you the "First" FRO) should assume the position of IC in Single Command, and attempt to do three (3) things:

1) Assume temporary command,
2) Establish a temporary Incident Command Post, and
3) Manage/Coordinate the incident as best as possible, until relieved by a superior.

Additional training on ICS is available via the SEMS "Approved Course of Instruction."

*Background:* ICS is not new (management principles have been used in past wars by the military). FIRESCOPE utilized these management principles in developing ICS in the 1970s. It has worked well for many civilian agencies over the past decades by applying proven management tools to the scene of an emergency.

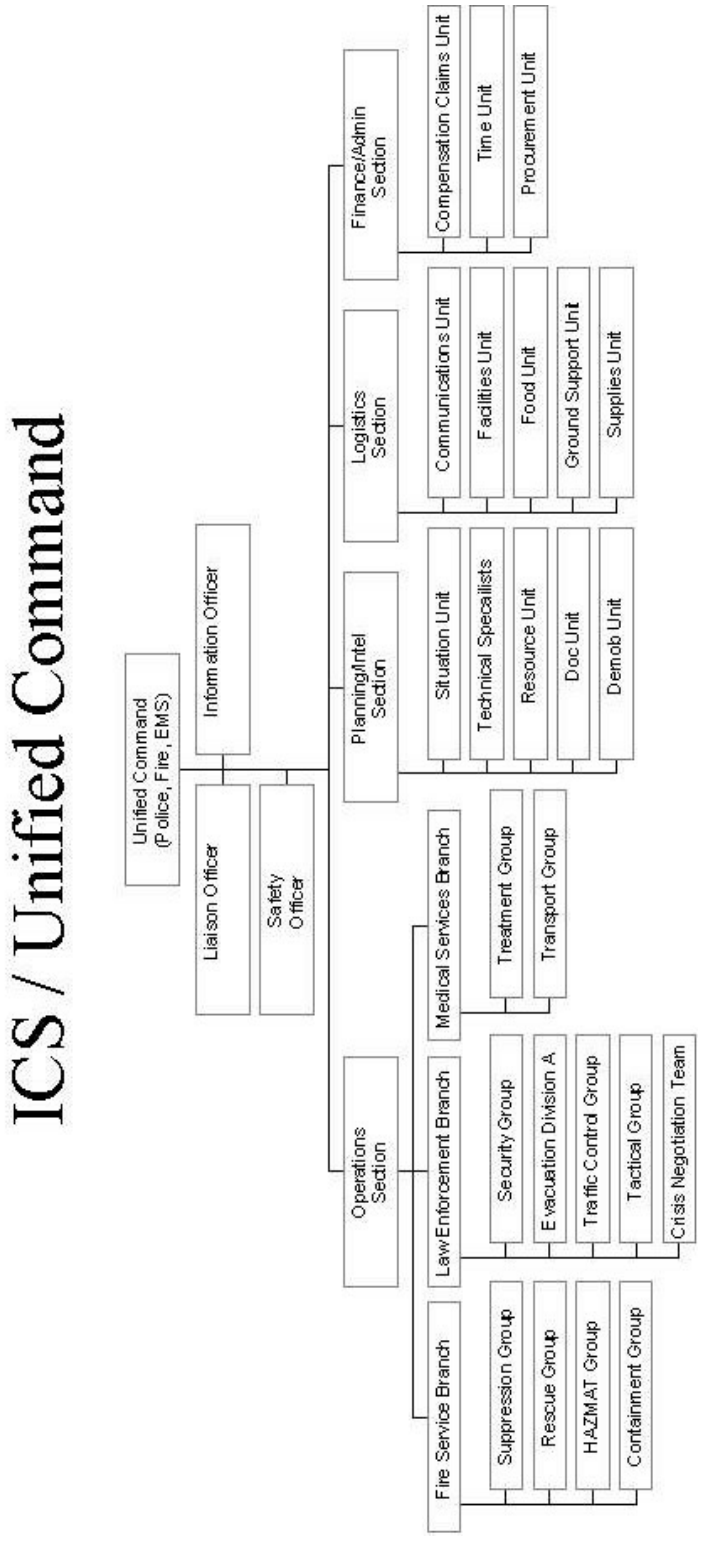
*Function:* Remember the functional key word in the ICS definition: *MANAGE!* ICS is a management system applicable to any emergency/disaster, any agency, and any jurisdiction (provided the agency knows, understands and regularly uses the ICS principles). It offers a "team" approach to managing an incident, where authority is not compromised, but rather unified. In functioning as an emergency management system, it provides for effective coordination!

*Structure:* Again, ICS starts with the position of IC, usually in Single Command (in a WMD incident, Unified Command will be quickly needed). The IC can activate other ICS positions in the organizational structure (*where FROs may fit), as needed, including:

*Command Staff:* Safety "Officer" (monitors for safety – stops unsafe acts)
Liaison "Officer" (point of contact for assisting and/or cooperating agencies)
Information "Officer" (provides info to media – and other interested parties)

*General Staff:* Planning & Intelligence "Chief" (collects, evaluates & disseminates incident info)
Logistics "Chief" (provides support to operations as needed)
Finance & Admin "Chief" (provides for financial & admin aspects of incident)
Operations "Chief" (tactical supervision of branches, groups, divisions and/or units*)

**BLOCK DATA SHEETS -** *ICS Organization (Unified Command – At Field ICP) Example:*



## BLOCK DATA SHEETS - *Other FRO "Issues" to Consider*

*Mass Casualties:* A WMD/NBC+E incident may produce a "mass casualty incident"(MCI) that will overwhelm the capability of FROs to conduct rescue and treatment. The natural tendency of a FRO is to rush in and rescue victims, which may be the wrong action in a WMD incident. Actual rescue attempts may not be safe or practical due to the toxic nature and impact of the agent/weapon involved (especially "C" and "E").

*Decon Basics:* Decon(tamination) is required when contamination on a victim is suspected, in order to protect life safety and prevent the spread of the problem. "Emergency" Decon is performed when there is an immediate life safety need (and there is no time for "Planned" Decon), and generally includes a three step process:

1) Self Triage: Victims move away from the hazard area to a safe refuge area;
2) Self Strip: Victims remove clothing as much as possible; and
3) Self Move: Victims move to low pressure water spray.

"Mass" Emergency Decon implies multiple contaminated persons in need of decon. Mass Emergency Decon will depend on a number of factors (actual numbers of victims, specific agent, availability of water, communication capability, etc.). Generally, immediate Mass Emergency Decon is critical for Chemical agents only. If Chemical agents are suspected, immediate Mass Emergency Decon can be done by the first "Fire" FRO Engine Company (which has water and communication). All FROs should also have a pre-made message to use via the PA to calmly and firmly communicate the 3 steps above, in order for the victims to self decon.

*Life Safety vs. Crime Scene:* Life safety is always the #1 priority at a WMD incident! However, a WMD event is also a federal crime scene! First responders need to preserve evidence as much as practically possible, especially after the life safety phase of the incident is over. FROs can accomplish this by: 1) disturbing the scene as little as possible; 2) observing everything; 3) observing everyone; 4) documenting observations; and 5) providing documentation to the appropriate law enforcement agency.

*Resources:* Many agencies and resources beyond the FRO level will be needed at a WMD event. Factors in determining need for additional resources include: Size and nature of incident, need for specialized equipment or expertise, need for trained personnel, SOPs, etc. It is OK to call for resources early – But make sure to provide a safe route, or better yet, a good "Staging Area" for the incoming agencies/resources (watch out for pre-announcing Staging Areas – It could be a secondary target).

## BLOCK DATA SHEETS - *Other FRO "Miscellaneous" Considerations*

*The Media:* The Media (particularly local Media) will show-up early into an incident, and have a major impact on how the public perceives and responds to the incident. FROs will be confronted early by a member of the Media. You must understand and follow your agency protocol on dealing with the Media. "No Comments" do not serve the Media, public or you very well. At least communicate the theme that "Public safety responders are here, more are coming, and they will not leave until any potential hazards are identified and eliminated." If there happens to be a "Public Information Officer" on-scene, refer the Media to that person, following the single voice concept. Bottom Line: Know and follow your agency protocols for dealing with the media.

*Rescue:* Rescue is a very important consideration that falls into the #1 priority of "Life Safety & Health." It will be one of the greatest "real world" challenges facing any first responder. In many cases, first responders may not be able to effect a rescue due to the nature of the agent, numbers of victims, PPE, etc. However, the "pull" to make a rescue will be strong at a real WMD event, and it will require a "Risk vs. Gain" decision making process before taking action. Consider the following steps:

*What are the life safety "**Gains**" of my action*
*What are the life safety "**Risks**" of my action*
*What is my "**Level, Resources and Capabilities**" for taking the action*
*What is the "**Overall Safety**" of my action*
*What is the "**Overall Viability**" of my action*

*Evacuation:* Whether to initially Evacuate, Shelter in Place or do nothing is another very important consideration that falls into the #1 priority of "Life Safety & Health." FROs will often have to make this initial decision with little or no information. Practically speaking, considering the following criteria that may help you make this decision is critical to life safety (e.g. probable chemical or explosive weapon):

*What is the immediate hazard*
*How many people to evacuate*
*What are my resources to effect evacuation*
*How can I communicate to the public, etc.*

*Termination:* When a Haz Mat or WMD incident terminates, certain protocols are followed. FROs can contribute to this process by good documentation of what they observed during the incident, and then forwarding that documentation to the IC.

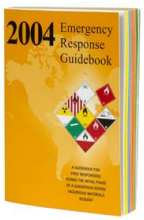
## BLOCK DATA SHEETS - *The "Emergency Response Guidebook" (ERG)*

*The ERG:* The 2004 Emergency Response Guidebook (ERG), designed primarily for initial IDHA and response to the more common hazardous materials transported on the highway and rail, has continued to address initial response to WMD/NBC+E incidents. There are a few minor updates in the 2004 vs. 2000 ERG versions regarding the "hazardous materials response" (some ID numbers and materials have been added and deleted, Guide Page 147 for old Organic Peroxides is now "dormant," there are "Tunes-up" to some Guide Numbers, etc.). There are also some minor changes in the 2004 ERG as it relates to WMD/NBC+ E, to include:

- Adding information on "Criminal/Terrorist Use of Chem/Bio Agents" to include "Radiological" agents. New rad info includes the differences with Chem/Bio, RDD events, rad indicators, safety and decon. (pages 354-357).
- Expanding "Hazard Zones" to include "Chemical Warfare" materials (page 5 + also relating to distances in the Green bordered pages).
- Continuing in the Green bordered pages to include worst case Initial Isolation and Protective Action distances for agents "When Used As A Weapon"(but "tunes-up" some of those distances).
- Adding terms related to a radiological incident (pages 358-365, to go along with terms already listed related to chem/bio incidents).

The 2004 ERG continues to have some *limited* use for FROs, to help them initially identify and take safe initial actions at a WMD/NBC+E incident. If using the 2004 ERG, try first to refer to the specific chemical. If unknown, refer to the generic NBC+E Guide Pages:

- *NUCLEAR – Page 163*
- *BIOLOGICAL – Page 158*
- *CHEMICAL – Page 153 (or go to specific Guide Page for specific chemical)*
- *EXPLOSIVE – Page 112 (unless 1.4 – use Guide Page 114)*



## BLOCK DATA SHEETS - *The "S.I.N.C.I.A.P.C.P.D.D.D." Acronym*

*The Basics:* An acronym/mind jogger has been developed in the CSTI Haz Mat FRO Course to help responders remember the basic tactical actions they may take in a "Haz Mat" incident. It also has some application for WMD/NBC+E incidents. Here are some applications of the "S.I.N.C.I.A.P.C.P.D.D.D." acronym in general:

*"S.I.N."* "**S**afety, **I**solation & **N**otifications":

- ***S**elf-Protection = Maintain "UUU" direction and safe isolation distance*
- ***I**solate & Deny Entry per N, B, C or E:*
  - ✓ ***Nuke**: Source = 75 to 500 feet; RDD = ½ mile; Weapon = Miles (remember – double distance and cut exposure by four times)*
  - ✓ ***Bio**: 75 to 300 feet (could also be outside of room with door closed)*
  - ✓ ***Chem**: 150 to 500+ feet; If Used as a Weapon –1/2 Mile to Miles*
  - ✓ ***Expl**: Letter bomb = 300 feet*; Pipe bomb = 500 feet*; Package bomb = 1000 feet*; Car bomb = 1500 feet*; Other –1/2 Mile to Miles (*behind a substantial barrier like a building, wall, hill, response vehicle, etc.)*
- ***N**otify = Per Agency SOP + FBI, OES & other responders via safe route*

*"C.I.A."* "**C**ommand, **I**dentification and Hazard Assessment & **A**ction Plan":

- ***C**ommand = If first FRO – You are IC (if other FROs – fit into ICS)*
- ***I**DHA - Not usually practical for FROs in early phase of NBC+E incident*
- ***A**ction Planning – Think before you act – Use a "Risk vs. Gain" process*

*"P.C.P."* "**P**rotective Equipment, **C**ountermeasures & **P**rotective Actions":

- ***P**PE per NBC + E specific response action (e.g. rescue) + Risk vs. Gain:*
  - ✓ ***Nuke**: Turnouts & SCBAs OK for Rescue if Gains outweigh Risks*
  - ✓ ***Bio**: Turnouts & SCBAs OK for Rescue if Gains outweigh Risks*
  - ✓ ***Chem**: Turnouts & SCBAs NOT OK for Rescue – Chem = Level A!*
  - ✓ ***Expl**: Turnouts & SCBAs NOT OK for Rescue – Expl = EOD Bomb Suit!*
- ***C**ountermeasures – Not usually applicable for NBC+E FROs, especially C+E!*
- ***P**As (Evacuate & Shelter-in-Place) - Per hazard, #s of people & FROs, time etc. (If "E" may have little choice but to evacuate quickly to a safe "Rally" point).*

## BLOCK DATA SHEETS - *The "S.I.N.C.I.A.P.C.P.D.D.D." Acronym (cont.)*

*"D.D.D."* "**D**econ, **D**isposal & **D**ocumentation":

- ***D**econ per NBC+E:*
  - ✓ ***Nuke**: If meters verify "Contamination" – Have time for Decon*
  - ✓ ***Bio**: If "Contamination" suspected – Have time for "Planned" Decon*
  - ✓ ***Chem**: If "Contamination" suspected – Immediate "Emergency" Decon:*
    - ❖ *Self Triage – Move away from hazard area to safe refuge area*
    - ❖ *Self Strip - Remove clothing (may reduce contamination 60-80%)*
    - ❖ *Self Move- To fire hose lines via "Soft Rain" flushing concept*
  - ✓ ***Expl**: If "Contamination" suspected – Have time for "Planned" Decon*
- ***D**isposal –Do not dispose of anything (may be evidence) – Crime Scene*
- ***D**ocument – What you saw, what you did, etc. via log/ICS 214 – Crime Scene*

*Other NBC+E Issues:* Nuclear Considerations/Reminders:

- Most monitoring devices on fire apparatus (i.e. CDV 715) do not detect alpha particles, and may not be properly calibrated – What's your status?
- "Exposure" is NOT "Contamination" (i.e. you can be exposed to radiation from a Beta particle, but if a Beta emitter is on you, you are contaminated).
- Doubling your distance from a source reduces your exposure by 4 times.

Biological Considerations/Reminders:

- Biological agents do not present a traditional FRO response – It will typically be recognized and handled by health officials – Unless a "Threat"!
- Most Biological agents have latent incubation periods – Symptoms show up one to several days after exposure (some, like Ricin, may show up in hours).
- Many current Bio monitoring devices may give false positives – Lab confirmation may take 24-48 hours – What's your status?

Chemical Considerations/Reminders:

- Many Chemical agents can be absorbed through the skin (i.e. GB), and symptoms typically show up soon after exposure – High PPE level required!
- If a potential "Inhalation" hazard - Wear SCBAs or get to a safe distance!
- For some Chem agents – Time is critical for Decon. Anything that delays emergency decon negatively impacts life safety and contamination spread!

Explosive Considerations/Reminders:

- Never approach an explosive device - "Observe" from afar with binoculars!
- When possible, stay behind a substantial barrier (building, wall, hill, etc.)!
- Do not use radios or cell phones with "EMR" within 500 feet of a bomb (in reality this will not be practical in urban settings – try to limit their use)!
- Always watch for secondary explosive devices & have a safe "Rally" point!

## BLOCK DATA SHEETS - *The "NBC+E" Reality*

*Reality Check:* First responders are trained to protect life as their number one priority. Upon recognition of an emergency, they are trained to aggressively respond to the seat of the problem. In an NBC+E incident, it will be difficult to recognize the true nature of the problem. By aggressively responding, they may become part of the problem and/or spread the problem. Further, there will be a high degree of initial chaos and conflicting information, with a potential for a large number of victims compared to a fewer number of responders. After self- protection, one of the most important and difficult actions by the first responder will be to *attempt* to control the scene (which may take hours/days). In reality, the first responder will be overwhelmed, and only able to initially take a few priority actions. Here are some general considerations:

*Priority Actions* "**S**afety, **I**solation, **N**otifications, **D**etect/**D**ocument/**D**econ/Determine Evac Need & Investigation":

- ***S**elf- Protection = Maintain "UUU" direction and safe isolation distance*
- ***I**solate/Deny Entry per NBC+E distances & <u>Attempt</u> to Control the Scene*
- ***N**otify = Per Agency SOP + FBI & other responders via safe route*
- ***D** – Depends on NBC or E:*
  - ✓ ***Nuke** = Determine Radiation Levels via Radiation Survey Meters*
  - ✓ ***Bio** = Determine/Document Impacted Public & Give Calming Info*
  - ✓ ***Chem** = Determine Need for Immediate Mass Emergency Decon*
  - ✓ ***Explosives** = Determine Need for Immediate Evacuation & Rescue*
- ***I**nvestigation = Observe "Crime Scene" Rules!*

*Crime Scene:* An NBC+E incident (whether hoax or real) is a crime scene. FROs can help by observing the following "Crime Scene" rules:

- *Try to disturb scene as little as possible (remember what you moved)*
- *Observe everything*
- *Observe everyone (could be perpetrator or witness)*
- *Document (via log or ICS Form 214)*
- *Communicate info/documentation to appropriate law enforcement official*

## BLOCK DATA SHEETS - *Your "N+B+C+E" Mind Jogger???*

*Risk vs. Gain*

If taking any "Non DEFENSIVE" action, remember/do a "Risk vs. Gain" process:

- *Identify **Gains** (to life/health, environment & property)*
- *Identify **Risks** (to life/health, environment & property – incl. responders)*
- *Assess Overall (OSHA) **Level, Resources & Capabilities***
- *Assess **Overall Safety***
- *Assess **Overall Viability***

Gains outweigh Risks = Go!

Risks outweigh Gains = No Go!

*YOU!*

Develop your own "Mind Jogger" for N+B+C+E initial priority FRO actions via:

- *Acronym*
- *Checklist*
- *Job Aid*
- *Whatever – Just Do it!*

# BLOCK SUMMARY SHEET

*FRO Key Words:* "DEFENSIVE" response actions!

*IDHA & WMD:* "IDHA" will take time - FROs will be driven early by NBC+E "Recognition" Clues!

*The ERG:* Primarily for "Transportation" Haz Mat releases – But may help the NBC+E FRO. Refer to specific chemical - If unknown, refer to the generic NBC+E Guide Pages:

- *NUCLEAR – Guide Page 163*
- *BIOLOGICAL – Guide Page 158*
- *CHEMICAL – Guide Page 153 (or specific guide for specific chemical)*
- *EXPLOSIVES – Guide Page 112 (or 114 for Explosives 1.4)*

*The Acronym:* "S.I.N.C.I.A.P.C.P.D.D.D." is an example of a "Mind Jogger" for a Haz Mat FRO:

**S**afety*
**I**solate & Deny Entry*
**N**otifications*
**C**ommand*
**I**dentification & Hazard Assessment (IDHA)
**A**ction Plan (Risk vs. Gain Process)*
**P**rotective Equipment*
**C**ountermeasures
**P**rotective Actions (Evacuate & Shelter-in-Place)*
**D**econtamination*
**D**isposal*
**D**ocumentation*

*This Haz Mat Acronym may apply to an NBC+E FRO (may also be other unique NBC+E actions, such as the "Time, Distance & Shielding" concept)

*NBC+E Reality:* During valid NBC+E incident, FROs will only be able to take a few initial priority response actions – Such as "S.I.N.D.I.":

- **S**afety
- **I**solate & Deny Entry
- **N**otifications
- **D** = *Depends on N, B, C or E . . .*
  - *N*: **D**etermine safe rad levels via rad survey meters;
  - *B*: **D**etermine/Document impacted public & give calming info;
  - *C*: **D**etermine mass emergency decon need; or
  - *E*: **D**etermine evacuation & rescue need!
- **I**nvestigation (Crime Scene – Document Observations)

*Bottom Line:* Need to develop your own "Mind Jogger" for initial priority FRO NBC+E actions, and/or at least have a "Risk vs. Gain" process for taking aggressive response actions!

# BLOCK ISSUES SHEET

Focus on **K**ey **R**esponse **I**ssues (**KRI**) in every Block of Instruction!

Here are some ideas for this block (Pick one, rank them or select your own **KRI**):

- ☑ If an NBC+E incident is primarily driven by recognition clues – Do I know them?
- ☑ What information can the ERG provide me regarding NBC+E incidents?
- ☑ What response guidance can the ERG provide me regarding NBC+E incidents?
- ☑ What are the limitations of using the ERG for NBC+E?
- ☑ Can the Haz Mat Acronym "S.I.N.C.I.A.P.C.P.D.D.D." work for me in an NBC+E incident?
- ☑ What "Risk vs. Gain" process will I follow to make hard decisions at the WMD event?
- ☑ **Have I developed an N+B+C+E "Mind Jogger" for initial priority response actions to take at an NBC+E incident?**

## *Your Key Response Issue (KRI) for this block is?*

_____

_____

_____

_____

_____

_____

_____

## BLOCK ACTIVITY SHEET

*(INSTRUCTOR MAY SELECT ONE OR MORE OF THE FOLLOWING ACTIVITIES):*

*ACTIVITY A.* Given an ERG and an N, B, C or E scenario, determine the Guide Page, primary hazard, initial isolation distance, and initial priority response actions you would take. Be prepared to provide a report of findings to the class.

*ACTIVITY B.* Within your group, per the scenario provided by the instructor, determine what "S.I.N.C.I.A.P.C.P.D.D.D." actions apply. Also, add any additional or unique actions you would take per the scenario. Finally, list with the five (5) initial priority response actions you would take per the scenario.

*ACTIVITY C.* As an individual, develop your own personal mind jogger for the priority actions you will initially take at an NBC+E incident. Be prepared to share your mind jogger.

*OTHER ACTIVITY:*

# BLOCK WORK SHEET

- In one word, what response "**mode**" should a FRO be in at a WMD event: **D** _____

- Given the 2000 ERG, list the general "**Guide Pages**" to use for the following:
  - ✓ Nuclear – Class 7 incident:
  - ✓ Biological incident:
  - ✓ Chemical – Class 6.1 incident:
  - ✓ Explosive – Orange Placard "1.4" incident:

- List the general "**FRO response actions**" that may apply to a general NBC+E incident, per the following acronym:
  - ✓ **S**afety - _____
  - ✓ **I**solation - _____
  - ✓ **N**otifications - _____
  - ✓ **C**ommand - _____
  - ✓ **I**dentification & Hazard Assessment - _____
  - ✓ **A**ction Plan - _____
  - ✓ **P**rotective Equipment - _____
  - ✓ **C**ountermeasures - _____
  - ✓ **P**rotective Actions - _____
  - ✓ **D**econtamination - _____
  - ✓ **D**isposal - _____
  - ✓ **D**ocumentation - _____

- List at least 1 "**additional/unique FRO action**" for each of the following incidents:
  - ✓ Nuclear:
  - ✓ Biological:
  - ✓ Chemical:
  - ✓ Explosive:

- List the "**Top 5**" initial priority response actions you would take for an NBC+E incident:
  - ✓
  - ✓
  - ✓
  - ✓
  - ✓

- Briefly list or describe the "**Risk vs. Gain**" process you will use for an NBC+E incident:

- Briefly list or describe the "**Acronym/Mind Jogger**" you will use for an NBC+E incident:

# E1

## *California Specialized Training Institute*

| | |
|---|---|
| **Block Title:** | WMD "First Responder - Operations" Case Studies |
| **Class:** | Hazardous Materials: FRO–WMD |
| **Block Scope:** | Instructor to cover and/or facilitate the following: Identify past uses of WMD/NBC+E agents by terrorists or other individuals. List appropriate recognition clues and initial response actions for these WMD/NBC+E incidents. |
| **Block Main Points:** | Block Purpose & Focus<br>Review of Case Studies<br>Report of Findings<br>Conclusions/Wrap-up, Issues & You |
| **Support Material:** | *See Block Note Sheet/Outline, Data Sheets, Issue Sheet, Activity Sheet and Work Sheet on following pages* |
| **Additional References:** | *See Appendix E (NBC+E Bibliography) for further references as needed* |
| **Time Recommended:** | 30 Minutes |

Block E1

# *WMD "First Responder - Operations" Case Studies*

## Main Points

- Block Purpose & Focus
- Review of Case Studies
- Report of Findings
- Conclusions/Wrap-up, Issues & You

# BLOCK NOTE SHEET/OUTLINE

- **Block Purpose & Focus**
  - ▶ Purpose
  - ▶ Focus

- **Review of Case Studies**
  - ▶ Instructor to Assign Case Study # to Group or Individual
  - ▶ Read/Review Case Study Assigned
  - ▶ As Directed by the Instructor - Discuss and/or Determine the Following:
    - Possible Recognition Clues/Indicators
    - Proper FRO Response Actions
    - Influencing Factors and/or Lessons Learned, etc.
  - ▶ Record Your Findings

- **Report of Findings**
  - ▶ Pick a Group Spokesperson or Be Ready to Report
  - ▶ Give a Brief Report of Group's/Individual's Findings

- **Conclusions/Wrap-up, Issues & You**
  - ▶ What Conclusions Can We Make
  - ▶ Key Response Issues:
  - ▶ Your Issues/Questions

**"Those who ignore history are doomed to repeat it."**

## BLOCK DATA SHEETS – *Case Study Overviews*

# **Case Study #1**: Aum Shinrikyo Attack in Matsumoto

*Summary* Matsumoto is a mountain resort city located on the island of Honshu, Japan. Population: 200,000. On June 27, 1994, at about 2300, a mass casualty incident occurred in Matsumoto. Authorities later determined this was an intentional release of the nerve agent Sarin by the Aum Shinrikyo religious sect. Seven people died in the attack. Over 600 people were ultimately affected.

*Location* Nearly all of the patients were located in an elliptical shaped area 800 meters by 570 meters, oriented downwind, in a residential area. Most of the residences were multiple family dwellings including apartments and dormitories (both university and company dorms). Most of the victims and all of the fatalities were indoors on the second or third floors of the buildings near the release site. Three of the fatalities were in a single building. All had their windows open because of the heat and high humidity (People on the first floor generally kept their windows shut at night.) Responders also found dead fish in a pond near the incident site.

*Time* At about 2100, people in the area began to sneeze and develop runny noses. At 2309, a man whose dog had died in his garden and whose wife had just lost consciousness requested EMS assistance. He was nauseated and had clouded vision. Individuals with the severest symptoms notified authorities between 2300 and 2400. At 0032 a physician arrived on scene. Requests for emergency medical assistance continued until about 0200. Individuals with less severe symptoms presented to health care providers between 0600 and 0800 the following morning. Most of the victims that presented in the early morning were elderly individuals who retired early the night before, slept with their windows closed then rose early and went outside.

*Weather* The air temperature was 84°F with 93% humidity. Winds were light, about 1-4 mph from the southwest. There was intermittent light rain.

*Symptoms* In five cases, the first symptom responders noticed was death. Three individuals were found dead in their living rooms. One was found dead in another room in the same building. Another person was found with gasp spontaneous respiration but no detectable pulse. He was transported to a nearby hospital and pronounced dead on arrival.

## Case Study #1: *(continued)*

*Symptoms* (cont.) The patients that were most severely exposed experienced the following symptoms: darkness of visual field (92.5%); runny nose, blurred vision and headache (70%); coughing, dyspnea, narrowing of visual field and ocular pain (50%); various other symptoms (30-40%).
Subsequent surveys found exposed individuals generally exhibited the following symptoms: headache, miosis, constriction of the visual field, fatigue, respiratory distress, vomiting and arrhythmia. Many others had convulsions, some severe.

*First Response* Local fire/EMS responders were the first on scene followed by police who implemented in-place protection. 52 firefighters responded and conducted most of the building searches and victim recoveries.
Shortly after 2300, an ambulance arrived and evacuated three people from an apartment (a husband, his wife and their daughter). Responders initially thought they had food poisoning and treated them accordingly. As they discovered more victims, the responders suspected foul play and requested a police response. Within an hour, several other residents of the neighborhood requested EMS assistance complaining of nausea, clouded vision and unusual odors. At 0010 the fire service responders declared a mass casualty incident. Shortly after, they began an organized search for more victims. No responders used any protective clothing.

*EMS Response* Authorities sent a physician to the scene immediately (standard practice in that region) along with six ambulances, a command vehicle and various fire apparatus. The physician set up triage at the scene. By 0414 he had transferred 37 patients to area hospitals. By the next day, 58 people were admitted to local hospitals. 253 others later visited outpatient clinics and a subsequent survey found an additional 277 people who exhibited symptoms of nerve agent exposure. Three people were found dead and four died shortly after being transported to a hospital. Of the 58 people admitted to area hospitals, all but one survived. One remains in a vegetative state. Medical personnel made an initial diagnosis of severe organophosphate poisoning and treated the victims accordingly.

*Identification* The Japan Institute of Public Hygiene and Pollution identified the substance as Sarin a week after the incident. Identification methods: gas chromatograph and mass spectroscopy. Samples: water from a pond near the release site, air from inside nearby buildings, tissue/fluid samples from victims and various materials gathered on scene.

## Case Study #1: *(continued)*

*Method of release* The perpetrators heated Sarin in the back of a small truck and forced the vapor through a chimney with a small fan.

*Amount of release* The exact amount is unknown. Authorities estimate there were less than 20 liters, most likely about 12 liters. Concentration unknown. The concentration may have been low since all of the fatalities were within only 80 meters of the release.

*FRO injuries* 17 of the 52 first responders complained of symptoms (half reported visual problems immediately after the incident). One responder was admitted to the hospital. He was one of the first emergency response personnel on scene, had worked in the room closest to the release for several minutes, had treated the most severely exposed victims and spent several hours on scene. At about 0500 he developed a headache, started vomiting and showed evidence of miosis. He was taken to the hospital and treated. He was discharged the next day and made a complete recovery (Note: This individual was a smoker, regularly drank alcohol and had a history of diabetes).

A total of 18 teams of responders worked on the incident in the first few hours (each team consisted of six or less people). Subsequent surveys found the medical complaints were concentrated in the eight groups who arrived first and spent the most time on scene. Only one member of the groups that arrived after 0100 and spent less than two hours on scene complained of any symptoms of exposure. No responders showed any symptoms a year after the incident.

*Medical* Several hospital personnel complained of general fatigue and nausea shortly after the incident. One emergency room doctor complained of miosis (Note: Neither the first responders or medical personnel performed *any* decon on the patients).

# **Case Study #2:** Aum Shinrikyo Attack in Tokyo

*Summary* At about 0800 on March 20, 1995, persons unknown placed packages on five trains in the vast Tokyo subway system. The individuals punctured the packages just before leaving the train allowing Sarin vapors to escape. All of the trains converged on a busy station in the center of Tokyo. The five packages affected over 5,000 victims, killing 12. 1,000 of the injured required hospitalization, 17 were critical.

*Location* The victims came from 15 stations and the areas near those stations. Most of the casualties were on the Hibya (Yellow) line. It is one of the oldest lines and has the smallest stations with the lowest capacity HVAC systems.

*Time* The incident began at 0750. By 0830, victims began to arrive at nearby hospitals. Within 10 minutes, hundreds of victims had arrived at 278 hospitals in the center of Tokyo. Over the next few days, over 5,000 people had presented at hospitals or outpatient clinics; 641 of them at *one* hospital alone (authorities estimate 80% had suffered no chemical exposure or showed no symptoms).

*Symptoms* Most of the fatalities occurred immediately upon exposure. Several had sat next to the packages containing the Sarin and some had handled the packages. In one case, a subway employee responding to passenger complaints picked up one of the packages and carried it off the train. In another case, a janitor attempted to mop up the spilled liquid. Both were dead within a few minutes of exposure.

Survivors generally exhibited the following symptoms: headache, eye pain, blurred vision, myosis, constriction of the visual field, fatigue, respiratory distress, agitation, frustration, vomiting and arrhythmia. Many others had convulsions, some severe.

Some survivors reported a strange odor in the train cars but many, including several near the containers, did not. Several people noticed a sticky-looking gelatinous or watery substance near the packages.

*First Response* Subway employees and local police officers were the first on scene. The only protective equipment they had were cloth gloves and gauze masks. Firefighters quickly responded with hazmat teams (and canaries).

## Case Study #2: *(continued)*

*EMS Response* Fire and EMS responders were on scene quickly, but since the incident occurred on a busy subway on a weekday morning, most of the people exposed were awake and in reasonably good physical condition. Individuals who were exposed quickly left the train cars and made their way to local hospitals either on foot or in taxis.

*Identification* Medical personnel initially thought they were dealing with a mass exposure to organophosphate or carbamate pesticides. About two hours after the release, doctors were told the substance involved was acetonitrile (later analysis of the liquid from the packages showed high concentrations of acetonitrile from the manufacturing process used to produce the Sarin). Within an hour it became clear that the extent and type of symptoms didn't correlate with exposure to acetonitrile. After researching appropriate reference material, doctors determined the substance involved was a nerve agent, most likely Sarin. Subsequent testing of the material confirmed this.

*Method of release* The perpetrators placed Sarin in five polyethylene bags then put the bags in individual cardboard boxes. They wrapped the boxes with newspaper. They carried the packages onto five different trains in the Tokyo subway system. At a pre-arranged time, they punctured the packages with a sharp object and left the train. There was no provision for mechanical dispersion or heating. The liquid simply leaked out of the bag.

*Amount of release* The exact amount is unknown. Authorities estimate there were less than 24 liters. Concentration: 25%.

# **Case Study #3:** Sverdlovsk Anthrax Outbreak of 1979

*Background* 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.

*Case* Anthrax outbreaks among humans usually occur as skin infections resulting from touching contaminated hides, leather, and animals. It is rare that an infection results from inhalation or ingestion. This outbreak sparked an international debate as to whether the outbreak was the result of natural causes or an accidental release.

*Official Story* According to Soviet sources, "people had become sick...from eating bad meat they bought from 'private butchers'." According to a report given by visiting Soviet doctors, the crisis began on the morning of the 7th of April, when Soviet officials were notified of a 'spate of deaths' over the previous weekend. Doctors "treated suspected victims with near-toxic doses of antibiotics" upon deeming the infection to be anthrax, which was confirmed by laboratory tests 3 days later.

*Pattern: Time* The epidemic ran intensely from 4 April to 19 April, the day the epidemic reached its peak with ten new cases...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 originally blamed on a single 29-ton lot of bone meal (cattle feed) sold in March from a factory, 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.

*Pattern: Location* "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." Nearly everyone affected lived or worked downwind of the facility. The disease manifested itself in the respiratory form rather than the more common cutaneous form. This was rare and indicated an airborne dispersion of the anthrax bacillus.

## Case Study #3: *(continued)*

*Conclusion*

"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."

*Sources*

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.
Eliot Marshall. *Sverdlovsk: Anthrax Capital?* Science. 240:4851; 383-385.
Abromova, et al. *Pathology of Inhalational Anthrax in 42 Cases from the Sverdlovsk Anthrax Outbreak.* Proceedings of the National Academy of Sciences of the USA. 90, Mar 15, 1993; 2291-4.

# **Case Study #4:** Intentional Contamination of Salad Bars

*Summary* In October of 1984, an outbreak of salmonella infections occurred in The Dalles, Oregon. A total of 751 people were infected. This outbreak was later found to be the result of the intentional spread of salmonella bacteria by members of the Bhagwan Shree Rajneesh religious cult located near the town of Antelope, Oregon.

*Location* Nearly all of the victims were residents of the area, however, tourists and visitors who lived in other locations were also affected. After epidemiologists established a definition of a case, they implemented a system of passive surveillance to collect information on the outbreak. In addition, they inspected restaurants, tested restaurant employees, interviewed the managers to collect information on any disgruntled employees, tested the water supply, examined suppliers of food and evaluated restaurant food preparation procedures. Only one of these factors yielded useful clues about the cause of the outbreak—statistical analysis of the eating habits of the patients. All had eaten at salad bars at ten area restaurants. (People who ate at the same restaurants but didn't use the salad bar were unaffected. Restaurant patrons who ate from salad bars in private banquet rooms were also not affected.)

*Time* The local public health department began to receive reports of persons with gastroenteritis in mid-September. The initial investigation indicated the victims had all eaten at the salad bars at one of two area restaurants. Public health officials confirmed the source of the outbreak when more cases appeared. They closed all restaurant salad bars on September 25.

The outbreak occurred in two waves, September 9-18 and September 19-October 10. Dozens of people a day presented with symptoms of salmonella infection (there were only ten cases in the previous three years in that area). Both waves followed deliberate and repeated contamination of the salad bars in September and October.

*Symptoms* Rapid onset of stomach pain, nausea, vomiting and diarrhea.

*Cause* In September 1985, investigators found an open vial of salmonella during a search of the commune facilities. Tests showed this bacteria was identical to that found in many of the patients. In 1986, two of the cult members confessed to intentionally spreading the bacteria.

# **Case Study #5:** Biowarfare or Workplace Violence?

*Summary* In 1996, an outbreak of *Shigella dysenteriae* infections occurred in a large medical center in Texas. A total of 13 people were infected. This outbreak was later found to be the result of the intentional contamination of pastries that were anonymously left in a break room. This outbreak attracted immediate attention due to the rare nature of *Shigella dysenteriae* outbreaks in the United States.

*Location* All of the cases occurred after the victims ate muffins and doughnuts that were left in a locked break room. Statistical analysis of the outbreak showed no increased risk of becoming infected from eating food from the break room refrigerator or consuming any beverages or tap water from the same location. There were no reported cases of dysentery from people who ate products from the same case lots at other locations.

*Victims* All of the victims were employees of the medical center laboratory. 12 employees ate the pastries and all became ill. None of the 33 lab employees who did not eat any of the muffins or doughnuts became ill. One family member of a lab worker became ill after eating a muffin the worker brought home.

*Time* On October 29, an unknown individual sent an anonymous e-mail to the laboratory staff (about 45 people) announcing the presence of free doughnuts and muffins in the break room. The culinary delights were left in the break room sometime between the night and morning shift. Twelve staff members developed severe, acute diarrhea after eating the items between 7:15 AM and 1:30 PM. The outbreak began on October 29 and continued until November 1.

*Symptoms* Rapid onset of severe diarrhea and elevated temperature.

*Investigation* Evidence indicates the bacteria came from a stock culture stored in the laboratory's storage freezer. Only laboratory employees had access to both areas and one of the cultures showed evidence of having been disturbed. This bacteria matched those found on the leftover muffins and the stool samples of many of the patients. They were different from strains of a similar bacteria that caused previous outbreaks in Texas. Nobody has confessed to this act and authorities have no suspects.

# **Case Study #6:** Chlorine? Bomb Incident in Australia March 1, 1997

*First Incident* Two bombs were detonated in three days in Bondi Junction, a suburb of Sydney. The first attack occurred at the Royal Randwick Shopping Center. Four people were taken to the hospital and a number were treated by EMS personnel after a "chlorine bomb" detonated at the shopping center. Responders evacuated hundreds of shoppers.

*Second Incident* The second bomb went off in the Eastgate Shopping Center at about 11:00 AM. The incident sent 13 people to the hospital and forced 700 people to evacuate the shopping center and a nearby apartment house. The device was in a plastic bag and was placed under a bench in a public area outside of a large grocery store. First responders and witnesses reported unusual odors and smoke coming from the devices shortly before they went off.

*Bomb Materials* The bomb materials were contained in a 2-liter glass jar. Press reports quoted the police as saying the devices in both incidents appeared to be very similar. According to officials at the scene, the device contained chlorine and an unidentified substance. They were not sure if the device was made to distribute chlorine or if the chlorine was present as an oxidizing agent.

*Injuries* Thirteen people were transported to area hospitals with injuries such as breathing difficulties to nausea, sore throats, skin irritation and dizziness. According to press reports, one victim stated he was "…completely overcome in a matter of seconds." Hospital officials reported none of the victims were seriously injured and all were treated and released.

# **Case Study #7:** Accidental Leakage of Cesium-137 in Goiania, Brazil, in 1987

*Background* In September of 1987, scavengers dismantled a metal canister from a radiotherapy machine at an abandoned Cancer Clinic in Goiania, Brazil. Five days later a junkyard worker pried open the lead canister to reveal a pretty blue, glowing dust: radioactive Cesium-137. In the following days, scores of Goianian citizens were exposed to the radioactive substance. In a nuclear disaster second only to Chernobyl, the city of Goiania had one of the largest radioactive leaks on its hands and for a few days, they knew nothing about it.

*Contamination* The cesium from within the canister was a "luminous blue powder" which both children and adults rubbed on their bodies. A six year old girl "rubbed the powder on her body so that she glowed and sparkled." She later ate a sandwich tainted with cesium powder from her hands. The cesium was later parceled out to friends and family, spreading the contamination from the junkyard to homes around the city, although mainly contained within a localized area. The radioactive substance continued to contaminate the population for a week before it was reported to health authorities.

*Response* When the Brazilian Nuclear Energy Commission dispatched a team equipped to handle a radiation accident they found: 244 persons to be contaminated, 54 seriously enough to be hospitalized for further tests or treatment. Thirty-four were treated and released. T he next day the ten sickest patients were airlifted to the Navy hospital, Dias, in Rio. Upon realizing the severity of the accident, the Brazilian government requested help from the International Atomic Energy Commission (IAEC) which sent a team of doctors.

*Effects* The medical team found the 20 most seriously irradiated victims had received doses ranging from 100 to 800 rads. Nineteen of the 20 had radiation-induced skin burns, from minor to major, and all 20 were internally contaminated, which meant that they were being continually irradiated from the cesium that they had inhaled or accidentally ingested. The patients themselves were radioactive.

## Case Study #7: *(continued)*

Accidental Leakage of Cesium-137 in Goiania, Brazil, in 1987

*Mistakes*

As the rest of the city was being decontaminated "technicians ...checked more than 34,000 people with Geiger counters at the city's soccer stadium." However, the National Commission on Nuclear Energy had underestimated the severity of the problem. At least 42 of its technicians did not wear protective overalls, hoods, gloves or boots while carrying out decontamination. No one remembered for several days to decontaminate the ambulances used to take victims from Rio de Janeiro's Santos Dumont airport to the city's naval hospital — one of only two facilities for treating radiation sickness. Decontamination efforts were lackadaisical at times, despite the use of helicopters equipped with radiation detectors to identify hot spots and the decontamination of items such as furniture and money. The accident contaminated homes, businesses and soil. What couldn't be decontaminated was collected or dismantled and placed in concrete lined drums for disposal.

*Conclusions*

The abandonment of the radiotherapy machine was an accident waiting to happen. The lack of adequate response time and materials greatly contributed to the number of casualties and fatalities. Although it took a few days to report the radioactive leakage, the cause is also twofold. Primarily, the canister should never have been left behind. Secondly, the general public had no idea that they were handling a radioactive substance. The lack of regulation of nuclear substances in many countries, whether for medical purposes or electricity, remains a major factor in the possibility of future nuclear accidents.

# **Case Study #8:** Other Aum Shinrikyo Attacks 1994-1995:

*1994* Authorities in Australia discover a dozen sheep carcasses near an Aum Shinrikyo facility in a rural section of Australia about 200 miles northeast of Perth. Tests showed degradation products of Sarin.

*7/14/94* City of Kamakuishiki. Mystery fumes affected dozens of people. Authorities later identified the substance as Sarin after analyzing the degradation products of samples collected in the area. Kamakuishiki was the headquarters of the Aum Shinrikyo sect. Local residents reported seeing sect members lying in a road near their facility, obviously ill. Soon after, the sect claimed U.S. and Japanese governments attacked them with chemical weapons.

*3/15/95* Tokyo. Three briefcases were found in a subway station near the main complex of national government offices. One was giving off a visible vapor. Each contained a compressed gas cylinder with an unidentified chemical (Japanese officials have not released any information about what was in the cylinders), an ultrasonic vaporizer, an electric fan and vent system, and a camcorder battery to power the fan. No terrorist group ever claimed responsibility for this incident.

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*Postscript:* Raids of sect facilities found equipment to make chemical and biological agents in large quantities. Sect members reported they had a truck equipped with an air compressor and vents to disperse gases, vapors or biological agents. They also had two remote-controlled helicopters that are commonly used for crop dusting in Japan. The group had made overtures to various Russian government officials (ostensibly to procure nuclear weapons) and had tried to buy land in northern Japan that contained uranium ore.

# **Case Study #9:** Oklahoma City Bombing, 1995

*Summary* On Wednesday, April 19, 1995, at 9:02 AM, a home made bomb inside a rental truck exploded in front of the Alfred P. Murrah Federal Building, Oklahoma City, Oklahoma, in the "Heartland" of America.. The blast blew off the front of the nine-story building, collapsing floors and burying victims under a mass of concrete and steel. One caller to 911 said: "We just had some kind of explosion downtown. About a third of the building has been blown away." Another witness said: "It was like an atomic bomb went off." First responders and volunteers initially helped with the rescue and pulled bodies from the rubble. Later Urban Search and Rescue Teams from throughout the country took part in the rescue efforts. It took almost 6 weeks to recover the bodies of all the victims of the blast. The FBI took charge of the investigation. A ranking law enforcement official said it took over 12 hours, and over 350 law enforcement personnel per shift, to establish a "secure" inner and outer perimeter. Before the infamous 9/11/01 terrorist incident, this was considered the worst peacetime attack on the continental U.S. soil.

*Bomb Materials* The "bomb" contained approximately two and a half tons of ammonium nitrate (a common farm fertilizer) mixed with fuel oil (packed into a rental truck).

*Victims* The bomb killed 168 people (including 19 children), and injured more than 500 others. One responder was killed, several others were injured.

*Date & Time* Two years earlier, on April 19, the Waco, Texas incident occurred, in which 82 members of the Branch Davidian sect died. Retaliation for the Waco incident was considered a motive for the Oklahoma City bombing. The time of the Oklahoma City bombing coincided with a full work day at the federal building, including the day care center. A full compliment of emergency responders were on duty. However, even with citizen volunteers, they were quickly overwhelmed.

*Investigation* Less than an hour and a half after the bombing, an Oklahoma traffic policeman stopped Timothy McVeigh for driving without license plates. Just as he was about to be released some 48 hours later, due to some good investigative work during the incident, McVeigh was identified as a suspect and charged with the bombings.

*Post script* McVeigh was later convicted and was executed by lethal injection. McVeigh's former army colleague, Terry Nichols was later charged and convicted of manslaughter and conspiracy and sentenced to spend the rest of his life in jail. The federal building was never rebuilt. Instead a memorial was established in 2000.

# BLOCK SUMMARY SHEET

*FRO Keys:* Recognize and take "DEFENSIVE" actions – *Learn from past WMD Case Studies!*

*Recognition:* NUCLEAR (Primary clue - Monitoring):

1. Source – Trefoil marking or med waste label still on source
2. RDD – Low/Soft/Dud type explosion with no apparent damage
3. Weapon – Projectile shape or pick-up Alpha readings close to source

BIOLOGICAL (Primary clue - Cluster epidemic picked up by Health officials):

1. Bacteria – Valid and suspicious letter
2. Virus – Unusual swarms of insects not common to area
3. Toxins – Most biologicals have 1 to several day incubation periods, but Ricin may show symptoms within 24 hours (T2 Mycotoxin in minutes)

CHEMICAL (Primary clue - Sudden onset of similar symptoms next to target site):

1. Nerve – Sudden onset of similar symptoms like miosis, twitching, salivation, etc.
2. Blood - Sudden onset of similar symptoms like red lips, convulsions, etc.
3. Blister - Sudden onset of similar symptoms like red skin, eye pain, etc.
4. Choking - Sudden onset of similar symptoms like eye and lung irritation, etc.
5. Irritating - Immediate symptoms like tearing, coughing, etc.

EXPLOSIVE (primary clue will be an explosion or bomb/unusual looking device):

1. Commercial Energetic Materials – Manufacturer, Color, Markings, Form, etc.
2. Military Ordnance – Color, Markings, Form, Fuse, Material, "Bomb" Like, etc.
3. Improvised Devices – Unusual Device/Form, Trip Wires, Unnatural Looking, etc.

*ERG Response:* Refer to specific chemical - If unknown, refer to the generic NBC+E Guide Pages:

- *NUCLEAR – Guide Page 163*
- *BIOLOGICAL – Guide Page 158*
- *CHEMICAL – Guide Page 153 or . . .*
- *EXPLOSIVES – Guide Page 112 or . . .*

*SINDI Response:* During valid NBC+E incident, FROs will only be able to take a few priority actions:

- **S**afety
- **I**solate & Deny Entry
- **N**otifications
- ❖ **D** = *Depends on N, B, C* or *E* - **D**etermine . . .
- **I**nvestigation (Observe "Crime Scene" Rules)

*Bottom Line:* Be a "Safe & Competent" WMD FRO – *Learning from past WMD Case Studies!*

# BLOCK ISSUES SHEET

Focus on **K**ey **R**esponse **I**ssues (**KRI**) in every Block of Instruction!

Here are some ideas for this block (Pick one, rank them or select your own **KRI**):

- ☑ In a real NBC+E incident, what are the tangible clues I can detect at the FRO level?
- ☑ In a real NBC+E incident, what were the appropriate FRO actions taken?
- ☑ In a real NBC+E incident, what were the inappropriate FRO actions?
- ☑ In a real NBC+E incident, what were the other influencing factors that impacted FROs?
- ☑ In a real NBC+E incident, can the ERG help a FRO?
- ☑ In a real NBC+E incident, can the "S.I.N.D.I." acronym help a FRO?
- ☑ **How can I continually review Case Studies to help me at a real NBC+E incident?**

## *Your Key Response Issue (KRI) for this block is?*

# BLOCK ACTIVITY SHEET

*(INSTRUCTOR MAY SELECT ONE OR MORE OF THE FOLLOWING ACTIVITIES):*

*ACTIVITY A.* Given a Case Study number by the instructor, review the N B C or E Case Study and list the recognition clues, proper FRO response actions and influencing factors based on the assigned Case Study. Be prepared to provide a report of findings to the class.

*ACTIVITY B.* Per the specific N B C or E Case Study and instructions provided by the instructor, report your findings to the class.

*OTHER ACTIVITY:*

## BLOCK WORK SHEET

- Given the N, B, C or E Case Study provided by the instructor, list the "**recognition**" clues:

- Given the N, B, C or E Case Study provided by the instructor, list proper "**FRO**" response actions:

- Given the N, B, C or E Case Study provided by the instructor, list the influencing "**factors**" that affected recognition and response:

- As a FRO, what "**Lessons Learned**" can you take from this Case Study provided by the instructor:

# F1

## *California Specialized Training Institute*

| | |
|---|---|
| **Block Title:** | WMD "First Responder – Operations" Exercise |
| **Class:** | Hazardous Materials: FRO–WMD |
| **Block Scope:** | Instructor to cover and/or facilitate the following: Given a simulated Nuclear, Biological, Chemical or Explosive (NBC or E) scenario, students must participate in an exercise, focusing on their ability to recognize the potential presence of the N, B, C or E weapon, conduct a safe identification and hazard assessment using the current Emergency Response Guidebook; and identify FRO response actions, including safety procedures, isolation distances, required notifications and agencies and resources needed for the simulated N, B, C or E incident. |
| **Block Main Points:** | Exercise Introduction & Instructions<br>Exercise Scenario<br>Exercise Focus/Questions/Discussion Points<br>Exercise Wrap-up, Issues & You |
| **Support Material:** | *See Block Note Sheet/Outline, Scenario(s) provided in the Activity Sheet and Work Sheet on following pages* |
| **Additional References:** | *See Appendix E (NBC+E Bibliography) for further references as needed* |
| **Time Recommended:** | 60 to 90 Minutes |

Block F1

# *WMD "First Responder – Operations" WMD Exercise*

## Main Points

- Exercise/Tabletop Introduction & Instructions
- Exercise/Tabletop Scenario(s)
- Exercise/Tabletop Questions/Discussion Points
- Exercise/Tabletop Wrap-up, Issues & You

---

**I knocked several times but you weren't in."**

***Opportunity***

---

# BLOCK NOTE SHEET/OUTLINE

- **Exercise Introduction & Instructions**
  - ▶ Learning Exercise – Not a Test – Must Participate!
  - ▶ May be "Tabletop" or "Functional" Exercise or Interactive Case Study
  - ▶ Note Exercise Objectives:
    - Recognize the Potential Presence of N, B, C or E Weapon
    - Conduct Safe Identification & Hazard Assessment via ERG
    - Identify Initial (SINDI) FRO Response Actions
    - Identify Additional Agencies & Resources Needed, etc.

- **Exercise Scenario(s)**
  - ▶ Per Instructor Assigned Scenario(s)
  - ▶ Read/Review Assigned Scenario(s)

- **Exercise Focus/Questions/Discussion Points**
  - ▶ Respond to/Discuss/Answer "Questions" Given by Instructor via Group/Individuals
  - ▶ Give a Brief Report of Groups/Individual Findings/Conclusions

- **Exercise Wrap-up, Issues & You**
  - ▶ Exercise Key Points
  - ▶ Key Response Issues:
  - ▶ Remember – Keep on Exercising!

---

**I knocked several times but you weren't in."**

***Opportunity***

---

*(NO DATA, SUMMARY OR ISSUE SHEETS IN THIS BLOCK)*

# SAMPLE BLOCK ACTIVITY SHEET:

*(INSTRUCTOR MAY USE THIS SCENARIO OR USE DIFFERENT SCENARIO[s])*

**FRO WMD "TABLETOP" SCENARIO:**

At about 8:00 AM today, the mail room clerk from a large private chemical company in Anytown opened a letter. The letter contained this threat (exact spelling included) with a small vile of a "yellow oily liquid" inside the letter:

> "You have just been eksposed to the anthrax virus. Spread it around to your other company pukes! You'll all die soon, and the world will be better of without a company that polutes our dear air and rivars! Son of Sulluap!!"

The mail room clerk quickly notified the shift supervisor, who ordered the mail room clerk and his fellow co-worker to report to the infirmary (two rooms down from the mail room in the main building). He also told them to leave the letter in the room and lock the door when leaving. The shift supervisor shut off the HVAC, evacuated the entire main building, except the infirmary, and called 911 to report a possible "Anthrax" incident, per the company plan. The actual plant and warehouse buildings are still occupied and fully operational. There are now 45 employees currently milling around the parking lot next to the main building. The other two buildings contain 120 employees total. In the infirmary, the mail room clerk is complaining of a headache, nausea and lightheadedness. His fellow co-worker said he thought he might be sick too, and has just now passed out.

Local fire, law enforcement, EMS, health and Haz Mat resources soon responded. You are the first responders from these agencies to arrive on scene.

**PROBLEM AREAS TO ADDRESS:**

- Recognition & Hazards
- ERG "IDHA" & Initial Response Guidance
- FRO Response Actions, incl.
  - Safety Considerations,
  - Isolation Distances,
  - Required Notifications
  - Other Initial Response Actions
- Additional Agencies/Resources Needed, etc.

**START TABLETOP EXERCISE NOW**

*(PER WORKSHEET OR QUESTIONS PROVIDED BY THE INSTRUCTOR)*

# BLOCK WORK SHEET

*Per a "Tabletop" Scenario provided by the instructor, "**discuss/answer**" the following questions:*

- Is this a potential N, B, C or E incident (list the specific "**type**" and "**recognition**" clues)?

- Based on the recognition clues, do you feel it is a "**valid**" incident (why or why not)?

- For this potential N, B, C or E incident, what are the potential "**hazards**" to you?

- What "**IDHA**" and "**response guidance**" does the "**ERG**" provide for this incident?

- What are the specific "**safety considerations**" for this incident?

- At what minimum distance would you initially "**isolate/set a perimeter**" for this incident?

- Who is specifically required to be "**notified**" for this incident?

- What additional "**agencies & resources**" are needed for this incident (what key info would you give to them, and how will you coordinate with those other agencies/resources)?

- Provide at least "**5 initial priority actions**" you would take as a FRO for this incident:

- What other "**unique/special**" actions do you see need to be addressed for this incident?

# G1

## *California Specialized Training Institute*

**Block Title:** Review, Evaluation & FRO WMD Class Closing

**Class:** Hazardous Materials: FRO–WMD

**Block Scope:** Instructor to provide for a review of the course main points, give an evaluation/exam/test as necessary *(if class is SLGCP funded, CSTI Certified FRO WMD Exam must be administered, and participants must pass said exam with a score of 70% or greater),* have participants select their Key Response Issue (KRI) for follow-up after class, allow for critique of the class, provide concluding remarks (with an emphasis on need for, and where to get, further WMD training and exercising) and note when certificates will be issued.

**Block Main Points:**
Block Purpose & Focus
FRO Level Review
Course Review
Participant Evaluation (exam as necessary)
Your #1 Key Response Issue (KRI)
Class Critique
Class Graduation/Certificates
Final Wrap-up, Issues & You

**Support Material:** *See Block Note Sheet/Outline, Data Sheets, Issue Sheet, Activity Sheet and Work Sheet on following pages*

**Additional References:** *See Appendix E (NBC+E Bibliography) for further references as needed*

**Time Recommended:** 30 Minutes

Block G1

# *Review, Evaluation & FRO WMD Class Closing*

## Main Points

- Block Purpose & Focus
- *FRO* Level Review
- Course Review
- Participant Evaluation (as needed)
- *Your #1 Key Response Issue (KRI)*
- Course Critique
- Course Graduation/Certificates
- Final Wrap-up, Issues & You

# BLOCK NOTE SHEET/OUTLINE

- **Block Purpose & Focus**
  - ▶ Purpose
  - ▶ Focus

- **FRO Level Review**
  - ▶ Recognize
  - ▶ Defensively Respond

- **Class Review & Additional Training**
  - ▶ Note Goal/Purpose & Scope of this Course
  - ▶ Note "Key Points" & "KRIs" per Previous Blocks:
    - A– Welcome & FRO WMD Class Overview
    - B – Intro to Terrorism & WMD/NBC+E Weapons
    - C – Recognizing WMD/NBC+E Weapons
    - D1 – WMD/NBC+E "First Responder" Actions
    - E1 - WMD "First Responder" Case Studies
    - F1 - WMD "First Responder" Tabletop Exercise
  - ▶ NOTE: Need & Means for Further FRO WMD Preparation & Training:
    - Other Local, State & Federal WMD Classes
    - Participate in Joint/Multi Agency WMD Exercises
    - Participate in After Action Critiques for "Lessons Learned," etc.

- **Participant Evaluation (exam as needed)**
  - ▶ Per Course Objectives
  - ▶ May be 25 Question Exam (FRO WMD Exam is required if class is SLGCP funded)

- **Your #1 Key Response Issue (KRI)**
  - ▶ Note Block KRIs & Now Select Your #1 KRI
  - ▶ What Action Will You Take Back Home on Your #1 KRI?

- **Class Critique**
  - ▶ Verbal Critique
  - ▶ Written Critique

- **Class Graduation/Certificates**
  - ▶ You Have Completed the FR**O** WMD Class
  - ▶ Check Your Certificates When Received

- **Final Wrap-up, Issues & You**
  - ▶ Concluding Remarks
  - ▶ Remaining Issues?
  - ▶ Remember:
    - ▪ You Are a WMD/NBC+E "FRO" – Recognize & Take Defensive Actions
    - ▪ Take Action Back Home on Your #1 KRI – Be Prepared for WMD/NBC+E
  - ▶ Thank You – Be a Safe & Competent WMD/NBC+E FRO!

***"A journey of a thousand miles starts with the first step."***

*(Confucius)*

## BLOCK DATA SHEETS - *Review of FRO WMD Class Goal & Objectives*

*Goal:* At the conclusion of the "First Responder OPERATIONS – Weapons of Mass Destruction" (FRO WMD) Class, the participants will be able to better recognize the presence of Weapons of Mass Destruction (WMD), including "Nuclear, Biological, Chemical or Explosive" (NBC+E) weapons, and implement actions to protect themselves and the public from the effects of an NBC+E incident (those actions taken should be "Defensive" in nature). This is a "Specialty" Course that compliments CSTI's "Hazardous Materials First Responder Operations" (FRO) Course.

*Terminal Objectives: By the end of the following blocks, the participant will be able to:*

(A) Identify the purpose, scope and need for a "WMD" Course at the OSHA "FRO" level;

(B) Define WMD and Terrorism, describe the current threat of terrorism in the United States (including the use of NBC+E weapons on local vulnerabilities via a "Threat Assessment" system); identify ways to prevent or deter a terrorist event; identify and describe the general types of NBC+E weapons (including the hazards each present to responders); describe the similarities and differences between a traditional Haz Mat and WMD incident; and understand the FRO "Role" and "Goals" at a WMD incident; and understand need to balance life safety with evidence preservation;

(C) Identify the indicators that would help first responders recognize when an incident may involve NBC+E weapons (including identifying at least one recognition clue and physiological sign/symptom for each type of NBC+E weapon); and know the value and limits of "IDHA" to validate incident information;

(D1) Understand the need to coordinate with typical WMD first responders; understand the function and structure of the Incident Command System; understand mass casualty implications and decontamination requirements; describe the first responder actions upon discovery of an incident that potentially involves NBC+E weapons; identify sources of assistance (including the current ERG); identify basic actions to follow for each general type of NBC+E weapon; and develop a "personal mind jogger" for initial priority FRO response actions;

(E1) Describe the past uses of NBC+E weapon by terrorists or others (listing appropriate recognition clues and initial response actions for these incidents);

(F1) Given a simulated N, B, C or E scenario, recognize the presence of the N, B, C or E weapon, conduct a safe identification and hazard assessment using the current ERG, and identify FRO response actions (including safety procedures, isolation distances, required notifications, and additional agencies and resources needed for the N, B, C or E scenario);

(G1) Understand the main points of the class; identify at least one "Key Response Issue" for follow-up action to increase the participant's ability to safely and competently respond to an NBC+E incident; and be aware of additional WMD training available to responders.

*As assessed by the instructor (instructor may use Work Sheets, the Tabletop Exercise, or observations to see if participants have met the course objectives.* ***If class is SLGCP funded, a CSTI Certified FRO WMD exam will be administered, covering the objectives above – Passing score is 70% or greater).***

# COURSE SUMMARY SHEETS

*BLOCK A -*

*FRO Defined:* " . . . individuals who respond to a release or potential release of hazardous substances as part of the initial response to the site for the purposes of protecting nearby persons, property or the environment from the effects of the release. They are trained in a DEFENSIVE fashion without actually trying to stop the release. . . "

*FRO "Role" & "Goals":* Safely & Competently Respond, within (FRO) Level, Resources & Capabilities! Better Protect – in order: Life/Health, Crime Scene, Environment & Property!!

*BLOCK B -*

*Terrorism:* Terrorism has happened in the U.S. and will continue to happen. "Apocalyptic" terrorist groups (and others) may use NBC+E "Weapons" at soft or hard "Targets" in your area. Do you know your vulnerable targets? Remember: The continued use of WMD/NBC+E weapons in the U.S. is still possible/probable.

*The "BLQ":* The most important "Bottom Line Question" for you: If/When WMD weapons are used in your area - Are you prepared to respond safely and competently as a FRO?

*WMD Types:* NUCLEAR Weapons (with at least 3 Primary "Sub" Types):

1. Source (i.e. Cesium, Cobalt, Radium, etc.)
2. RDD (Radiological Dispersion Device or "Dirty" bomb)
3. Weapon (e.g. crude Atomic/Fission Bomb, etc.)

BIOLOGICAL Weapons (with at least 3 Primary "Sub" Types):

1. Bacteria (i.e. Anthrax, Cholera, Plague, Tularemia, Typhoid, etc.)
2. Virus (i.e. Ebola, Yellow Fever, Smallpox, Encephalitis, etc.)
3. Toxins (i.e. Ricin, Botulinum, Mycotoxin, Aflatoxin, etc.)

CHEMICAL Weapons (with at least 5 Primary "Sub" Types):

1. Nerve (i.e. GA/Tabun, GB/Sarin, GD/Soman, VX, etc.)
2. Blood (i.e. AC/Hydrogen Cyanide, CK/Cyanogen Chloride, Arsine, etc.)
3. Blister (i.e. H/Mustard, L/Lewisite, CX/Phosgene Oximine, etc.)
4. Choking (i.e. Cl/Chlorine, CG/Phosgene, Diphosgene, etc.)
5. Irritating (i.e. OC/Pepper Spray, CS/Tear gas, CN/Mace, etc.)

EXPLOSIVE Weapons (with at least 3 Primary "Sub" Types):

1. Commercial Energetic Materials (e.g. Dynamite)
2. Military Ordnance (e.g. Grenade)
3. Improvised Devices (e.g. Pipe Bomb)

*Primary Hazard:* "N (source), B & C" Primary Hazard: <u>Health/Toxicity #1</u>!
"N (RDD & bomb) +E" Primary Hazard: <u>Blast Wave + Fragmentation + Thermal</u>!

## **COURSE SUMMARY SHEETS** (cont.)

*BLOCK C -*

*Recognition Clues:* NUCLEAR (Primary clue - Monitoring):

1. Source – Trefoil marking or med waste label still on source
2. RDD – Low/Soft/Dud type explosion with no apparent damage
3. Weapon – Projectile/bomb like shape or pick-up Alpha readings close to source

BIOLOGICAL (Primary clue - Cluster epidemic picked up by Health officials):

1. Bacteria – Valid and suspicious letter
2. Virus – Unusual swarms of insects not common to area
3. Toxins – Most biologicals have 1 to several day incubation periods, but Ricin may show symptoms within 24 hours (T2 Mycotoxin in minutes)

CHEMICAL (Primary clue - Sudden onset of similar symptoms next to target site):

1. Nerve – Sudden onset of similar symptoms like miosis, twitching, salivation, etc.
2. Blood - Sudden onset of similar symptoms like red lips, convulsions, etc.
3. Blister - Similar symptoms like red skin, eye pain, severe itching, etc.
4. Choking - Similar symptoms like eye and lung irritation, chest pain, etc.
5. Irritating - Immediate symptoms like tearing, coughing, etc.

EXPLOSIVE (Primary clue – Blast or bomb like/unusual looking device):

1. Commercial Energetic Materials – Manufacturer, color, markings, shape, etc.
2. Military Ordnance – Color, markings, size/shape, fuse, material, etc.
3. Improvised "Explosive" Device/IEDs – Unusual device or form, trip wires, etc.

*"IDHA":* FROs will be driven early by NBC+E Recognition Clues – IDHA will help later!

*BLOCK D1 –*

*FRO Key Words:* "DEFENSIVE" response actions!

*The ERG:* Primarily for "Transportation" Haz Mat releases – But may help the NBC+E FRO.

Refer to specific chemical - If unknown, refer to the generic NBC+E Guide Pages:

- *NUCLEAR – Guide Page 163*
- *BIOLOGICAL – Guide Page 158*
- *CHEMICAL – Guide Page 153 (or specific guide for specific chemical)*
- *EXPLOSIVES – Guide Page 112 (or 114 for Explosives 1.4)*

*NBC+E Reality:* During valid WMD/NBC+E incident, FROs will only be able to take a few initial priority response actions – Such as *"S.I.N.D.I.":*

## COURSE SUMMARY SHEETS (cont.)

*"S.I.N.D.I" for -* "Nuclear" Agents/Weapons:

- ***S**afety – Maintain "UUU" direction and safe isolation distance*
- ***I**solate – Source = 75 to 500+ feet; RDD = ½ mile; Weapon = Miles*
- ***N**otify – Per Agency SOP + FBI, DHS & Responders via safe route*
- ➲ ***D**etermine – Radiation levels per rad monitoring/survey devices*
- ***I**nvestigation – Observe "Crime Scene" Rules*

*"S.I.N.D.I" for -* "Biological" Agents/Weapons:

- ***S**afety – Maintain "UUU" direction and safe isolation distance*
- ***I**solate – 75 to 300 feet (could also be outside of room with door closed)*
- ***N**otify – Per Agency SOP + FBI, CDC & Responders via safe route*
- ➲ ***D**etermine/Document – Victims potentially exposed & provide calming info*
- ***I**nvestigation – Observe "Crime Scene" Rules*

*"S.I.N.D.I" for -* "Chemical" Agents/Weapons:

- ***S**afety – Maintain "UUU" direction and safe isolation distance*
- ***I**solate –150 to 500+ feet; If used as a weapon – ½ to 1+ Miles*
- ***N**otify – Per Agency SOP + FBI & Responders via safe route or staging area*
- ➲ ***D**etermine – If contamination suspected - Immediate Emergency Decon needed*
- ***I**nvestigation – Observe "Crime Scene" Rules*

*"S.I.N.D.I" for -* "Explosive" Weapons:

- ***S**afety – Maintain a safe distance at a "rally point" behind a substantial "barrier" (wall, hill, vehicle, etc.) + Do not approach or disturb the item*
- ***I**solate – Letter bomb = 300 feet; Pipe Bomb = 500 feet; Package/Satchel Bomb = 1000 feet; Car Bomb = 1500 feet; Other = ½ to 1+ Miles*
- ***N**otify – Per Agency SOP + FBI, EOD & Responders via staging area*
- ➲ ***D**etermine – If immediate evacuation & rescue is needed*
- ***I**nvestigation – Observe "Crime Scene" Rules*

*Risk vs. Gain* If taking any other "aggressive" actions, do a "Risk vs. Gain" process:

- *Identify **Gains** (to life/health, environment & property)*
- *Identify **Risks** (to life/health, environment & property – incl. responders)*
- *Assess Overall (OSHA) **Level, Resources & Capabilities***
- *Assess **Overall Safety***
- *Assess **Overall Viability***

Gains outweigh Risks = Go! Risks outweigh Gains = No Go!

## COURSE SUMMARY SHEETS (cont.)

*Crime Scene:* An NBC+E incident (whether hoax or real) is a crime scene. FROs can help by observing the following "Crime Scene" rules:

- *Try to disturb scene as little as possible (remember what you moved)*
- *Observe everything*
- *Observe everyone (could be perpetrator or witness)*
- *Document (via log or ICS Form 214)*
- *Communicate info/documentation to appropriate law enforcement official*

*Other Responder Issues:* Many Key Issues will face the FRO at a WMD event, here are just a few:

- *Need to know and coordinate with other WMD response agencies;*
- *Need to know purpose/function of ICS and use ICS structure;*
- *Need to know mass casualty implications and decon requirements;*
- *Need to balance life saving activities with evidence preservation;*
- *Need to know how to determine & call for additional WMD agencies/resources;*
- *Need to be able to take realistic initial priority FRO NBC+E actions; etc.*

*Bottom Line:* Need to develop your own "Mind Jogger" for initial priority FRO NBC+E actions!

*BLOCK E1 – Case Studies:* Keep looking at NBC+E case studies for recognition clues & FRO actions.

*BLOCK F1 – Exercises:* Keep exercising on NBC+E scenarios for recognition clues and FRO actions.

*BLOCK G1 - Mother of All Bottom Lines:* Be a "Safe & Competent" WMD FRO - Take Action on Your #1 "KRI" - ***Keep on Preparing & Training for WMD!***

# COURSE ISSUES SHEET

You Should Have Focused on **K**ey **R**esponse **I**ssues (**KRI**) in past Blocks of Instruction!

Review: "**What is your KRI**?"

It may be a major ***FRO response question*** or problem, which needs to be ***addressed*** (before, during or after the WMD incident), AND requires you to take ***action***:

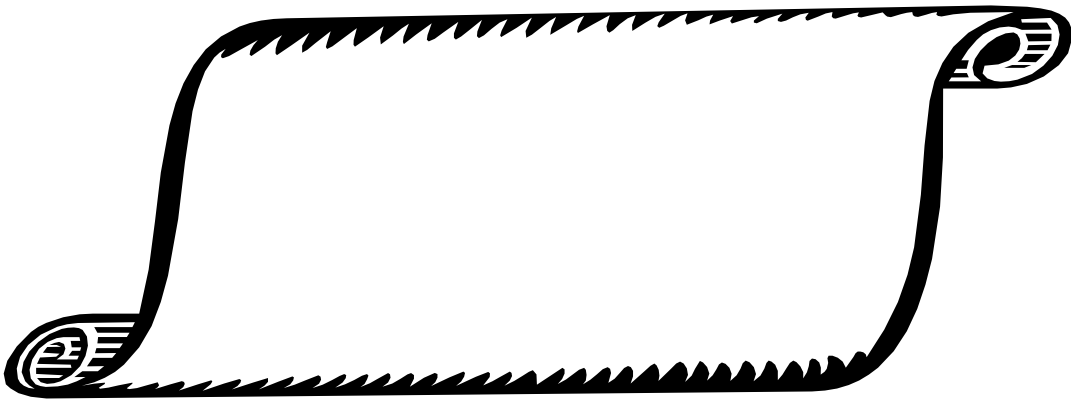
Get an answer, or develop a Mind Jogger tool, when you return ***back home***,

in order to be a ***safe & competent FRO at an WMD incident in your jurisdiction/agency.***

From Past Blocks of Instruction – Select Your #1 Block **KRI**s:

- ☑ A Block:
- ☑ B Block:
- ☑ C Block:
- ☑ D1 Block:
- ☑ E1 Block:
- ☑ F1 Block:

## *Finally - What is Your #1 KRI for this COURSE?*



# BLOCK ACTIVITY SHEET

*(INSTRUCTOR MAY SELECT ONE OR MORE OF THE FOLLOWING ACTIVITIES):*

*ACTIVITY A.* As individuals, select your #1 Key Response Issue (KRI):

*ACTIVITY B.* Given your #1 Key Response Issue (KRI), list the action you will take when you get back home to address/resolve that issue:

*OTHER ACTIVITY:*

# BLOCK WORK SHEET

- In your own words, briefly "**define**" the First Responder **Operations** level:

- In your own words, what is your **"Role"** as a "**FRO**" for a WMD/NBC+E incident:

- In your own words, what are your **"Goals"** as a "**FRO**" for a WMD/NBC+E incident:

- List at least 1 specific "**clue/indicator**" for each "**Type**" of NBC+E Weapon:
  - ❖ Nuclear Weapon Type Clues:
    - ✓ _____ - _____
    - ✓ _____ - _____
    - ✓ _____ - _____
  - ❖ Biological Weapon Type Clues:
    - ✓ _____ - _____
    - ✓ _____ - _____
    - ✓ _____ - _____
  - ❖ Chemical Weapon Type Clues:
    - ✓ _____ - _____
    - ✓ _____ - _____
    - ✓ _____ - _____
    - ✓ _____ - _____
    - ✓ _____ - _____
  - ❖ Explosive Weapon Type Clues:
    - ✓ _____ - _____
    - ✓ _____ - _____
    - ✓ _____ - _____

- List at least 5 "**initial priority basic actions**" for a "**FRO**" at a WMD/NBC+E incident:
  - ✓
  - ✓
  - ✓
  - ✓
  - ✓

- What is your #1 "**KRI**" + What "**action**" will you take back home to address/resolve your #1 KRI:

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# FRO WMD

## Appendix A
## (Acronym List)

**FRO WMD ACRONYM LIST**

| | |
|---|---|
| **AC -** | "Hydrogen Cyanide" Blood Agent |
| **ARG -** | Accident Response Group (DOE) |
| **ALARA** | As Low As Reasonably Achievable |
| **ANFO** | Ammonium Nitrate (fertilizer mixed with) Fuel Oil |
| **AP** | Ammonium Perchlorate |
| **BLEVE** | Boiling Liquid Expanding Vapor Explosion |
| **CAL-OSHA** - | California Occupational Safety and Health Administration |
| **CCR** - | California Code of Regulations |
| **CDC-** | Center for Disease Control (DHHS) |
| **CDF** - | California Department of Forestry (& Fire Protection) |
| **CFR** - | Code of Federal Regulations |
| **CHEMTREC** - | Chemical Transportation Emergency Center |
| **CHP -** | California Highway Patrol |
| **CK -** | "Cyanogen Chloride" Blood Agent |
| **CL -** | "Chlorine" Choking Agent |
| **CN -** | "Mace" Irritating Agent |
| **CS -** | "Tear Gas" Irritating Agent |
| **DFG** - | California Department of Fish and Game |
| **DFO-** | Disaster Field Office |
| **DHS (CA)** - | Department of Health Services (California) |
| **DHHS** - | United States Department of Health and Human Services |
| **DOC**- | Department Operating Center |
| **DOD**- | Department of Defense |
| **DOE** - | Department of Energy |
| **DOT** - | Department of Transportation |
| **EOD UNIT** - | Explosives Ordnance Disposal Unit |
| **EMR** - | Electro Magnetic Radiation |
| **EPA** - | Environmental Protection Agency |
| **EMS** - | Emergency Medical Services |
| **EMSA** - | Emergency Medical Services Agency |
| **EOC** - | Emergency Operations Center |
| **EOD UNIT** - | Explosives Ordnance Disposal Unit |
| **EPA** - | Environmental Protection Agency |
| **ERD** - | Emergency Response Division (EPA) |
| **ERG** - | Emergency Response Guidebook (DOT) |
| **ERT -** | Evidence Response Team (FBI) |
| **ESD** - | Electro Static Discharge |
| **FAA** - | Federal Aviation Authority |
| **FBI** - | Federal Bureau of Investigation |
| **FD-** | Fire Department |
| **FDA-** | Federal Drug Administration (DHHS) |
| **FED-OSHA** - | Federal/U.S. Occupational Safety and Health Administration |
| **FEMA** - | Federal Emergency Management Agency |
| **FOSC** - | Federal On-Scene Coordinator |
| **FRA -** | First Responder Awareness |
| **FRO -** | First Responder Operational |
| **FRP -** | Federal Response Plan |
| **GA -** | "Tabun" Nerve Agent |
| **GB -** | "Sarin" Nerve Agent |
| **GD -** | "Soman" Nerve Agent |
| **HAZ MAT** - | Hazardous Material |
| **H -** | "Mustard" Blister Agent |

**FRO WMD ACRONYM LIST (cont.)**

| | |
|---|---|
| **HEPA -** | High Efficiency Particulate Air (filter/mask) |
| **IAP-** | Incident Action Plan |
| **IC-** | Incident Commander |
| **ICP -** | Incident Command Post |
| **ICS** - | Incident Command System |
| **IDHA -** | Identification and Hazard Assessment |
| **IDLH** - | Immediately Dangerous to Life or Health |
| **JOC -** | Joint Operations Center |
| **KRI -** | Key Response Issue |
| **L -** | "Lewisite" Blister Agent |
| **LD/C (50%/100%) -** | Lethal Dose/Concentration (percent follows indicating death rate) |
| **LFA-** | Lead Federal Agency |
| **MCI-** | Mass Casualty Incident |
| **MEDCOM-** | US Army Medical Command (DOD) |
| **MMRS-** | Metropolitan Medical Response System (DHHS) |
| **MSDS-** | Material Safety Data Sheets |
| **NBC+E -** | Nuclear, Biological, Chemical & Explosive Agents |
| **NIIMS** - | National Interagency Incident Management System |
| **NMRT-** | National Medical Response Team (DHHS via Local Jurisdiction) |
| **NRC** - | National Response Center |
| **OES** - | Office of Emergency Services (State or County) |
| **OSHA** - | Occupational Safety and Health Administration |
| **PD-** | Police Department |
| **PDD 39**- | Presidential Decision Directive #39 |
| **PIO** - | Public Information Officer |
| **PPC** - | Personal Protective Clothing |
| **PPE** - | Personal Protective Equipment |
| **PPM** - | Parts Per Million |
| **RAT -** | Radiological Assistance Team (DOE) |
| **RDD** - | Radiation Dispersal Device |
| **REAC/TS -** | Radiation Emergency Assistance/Training Site (DOE) |
| **REM** - | Roentgen Equivalent Man |
| **RDD** - | Radiological Dispersal Device |
| **REOC -** | Regional Emergency Operations Center (California) |
| **RTF/CBIRF -** | Response Task Force/Chemical Biological Incident Response Force (DOD) |
| **RTF/CBRRT -** | Response Task Force/Chemical Biological Rad Response Team (DOD) |
| **SCBA** - | Self-Contained Breathing Apparatus |
| **SEMS** - | Standardized Emergency Management System |
| **SINCIAPCPDDD-** | Safety, Isolate, Notify, Command, Identification & Hazard Assessment, Action Plan, Protective Equipment, Countermeasures, Protective Actions, Decontamination, Disposal, Documentation |
| **SINDI-** | Safety, Isolate, Notify, Depends (n=detect; b=document; c=decon; e=determine evacuation need), Investigation |
| **SLGCP -** | State & Local Government Coordination & Preparation |
| **SOP/G -** | Standard Operating Procedures/Guidelines |
| **TTT** | Triage, Treatment & Transport |
| **TDTT** | Triage, Decontamination, Treatment & Transport |
| **SPEC** - | Specialist |
| **TECH** - | Technician |
| **TEU** - | Technical Escort Unit (DOD) |
| **TLV**- | Threshold Limit Value |

**UC** - Unified Command



**FRO WMD ACRONYM LIST (cont.)**

**USA** - United States Army – or- United States of America
**USAF** - United States Air Force
**USAR** - Urban Search & Rescue (Teams)
**USMC** - United States Marine Corps
**USN** - United States Navy
**USCG** - United States Coast Guard
**USEPA** - United States Environmental Protection Agency (EPA)
**USNRC** - United States Nuclear Regulatory Commission
**UUU** - Upwind, Upgrade, Upstream
**VX -** "V" Series Nerve Agent
**WMD** - Weapons of Mass Destruction

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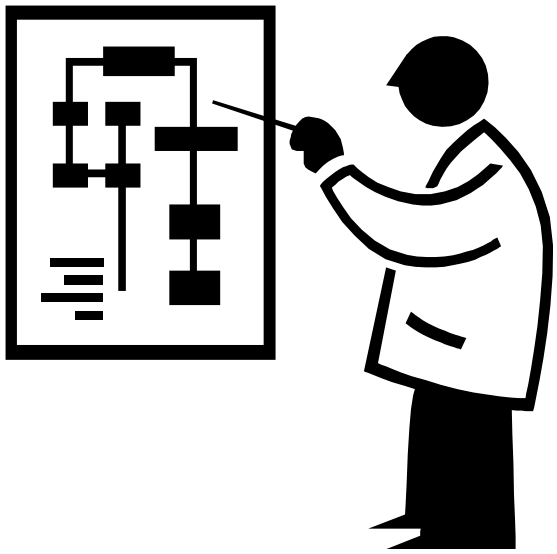
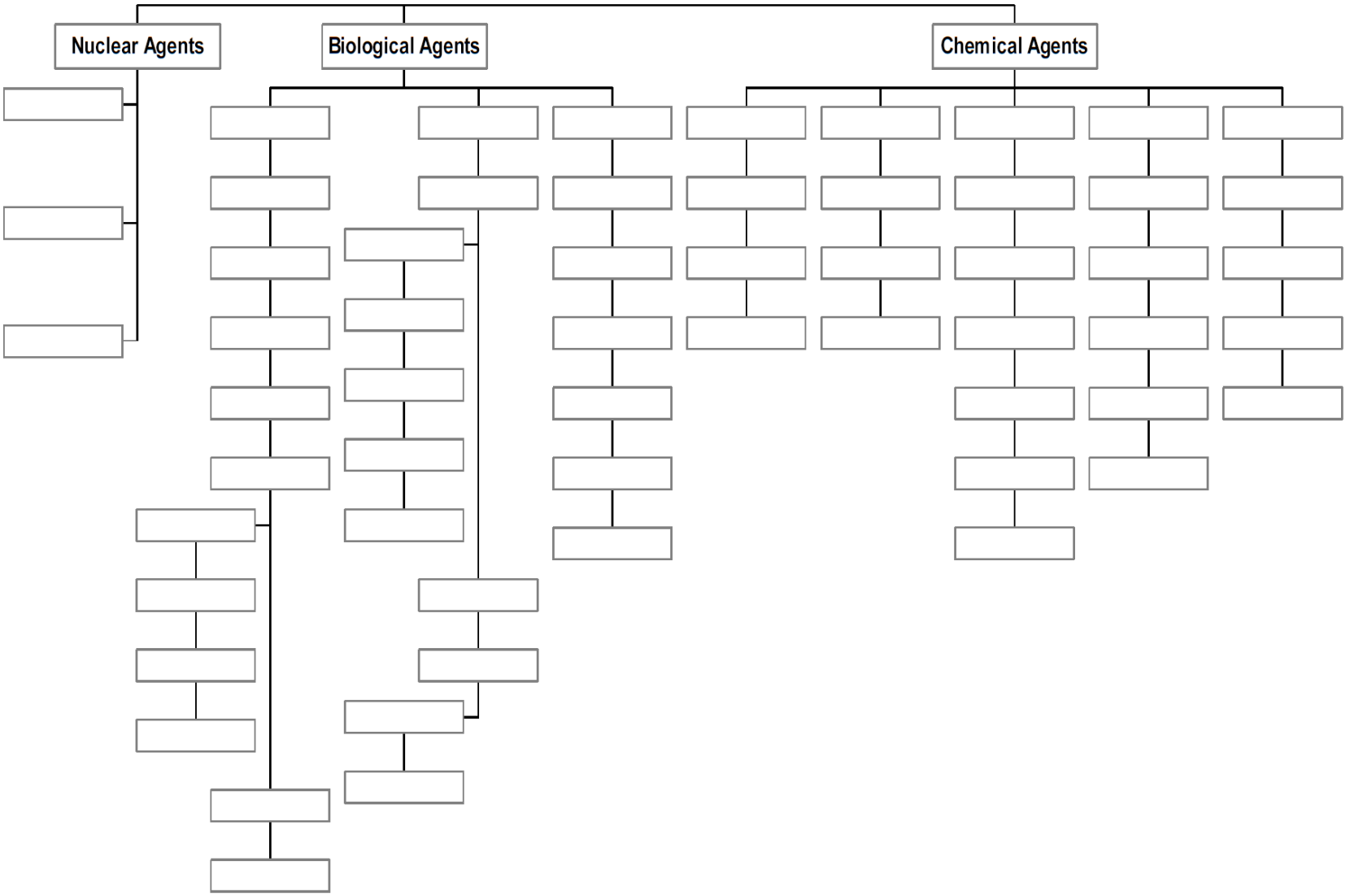
# FRO WMD

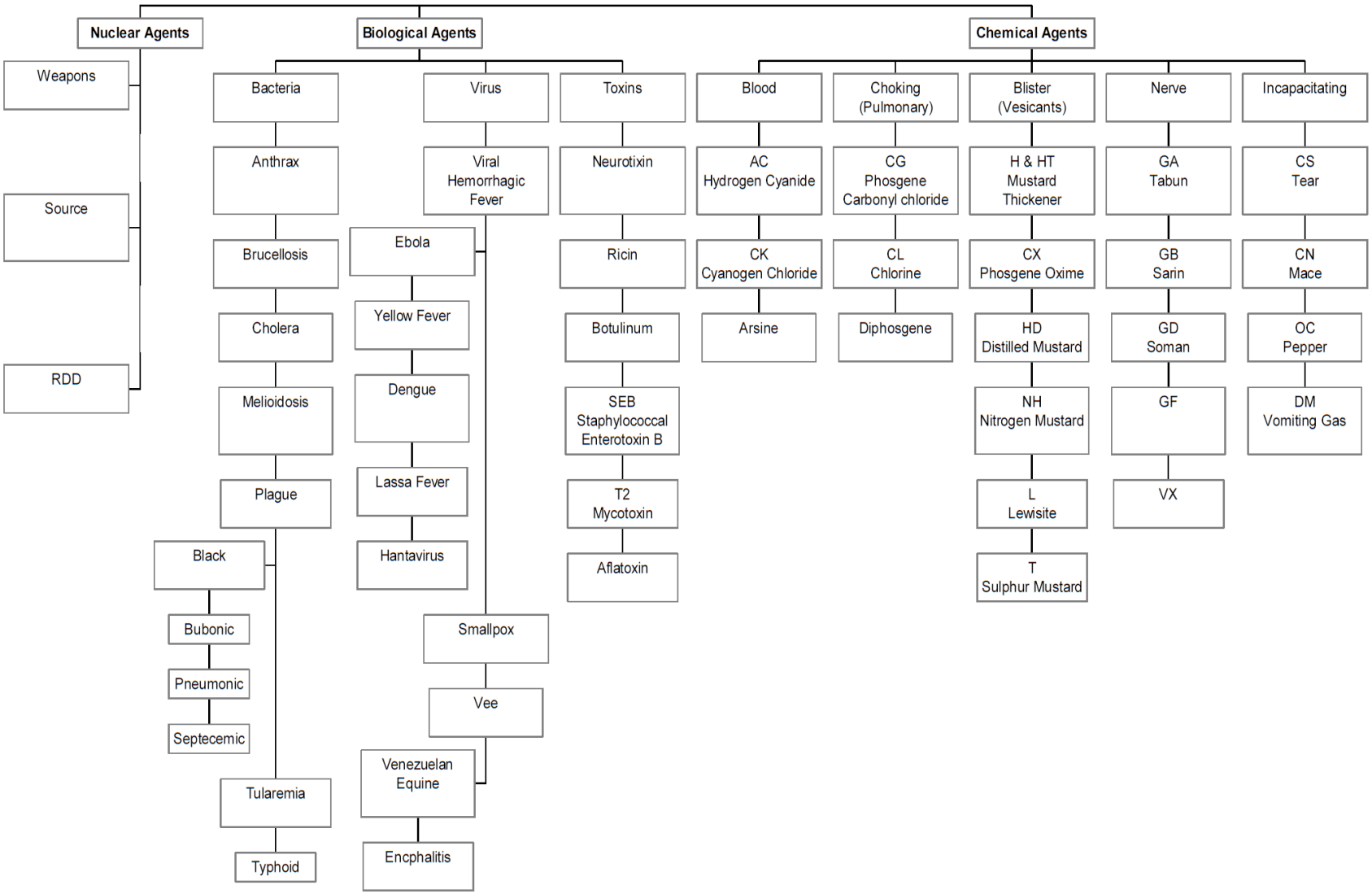
## Appendix B
## (NBC+E Type & Example Charts)



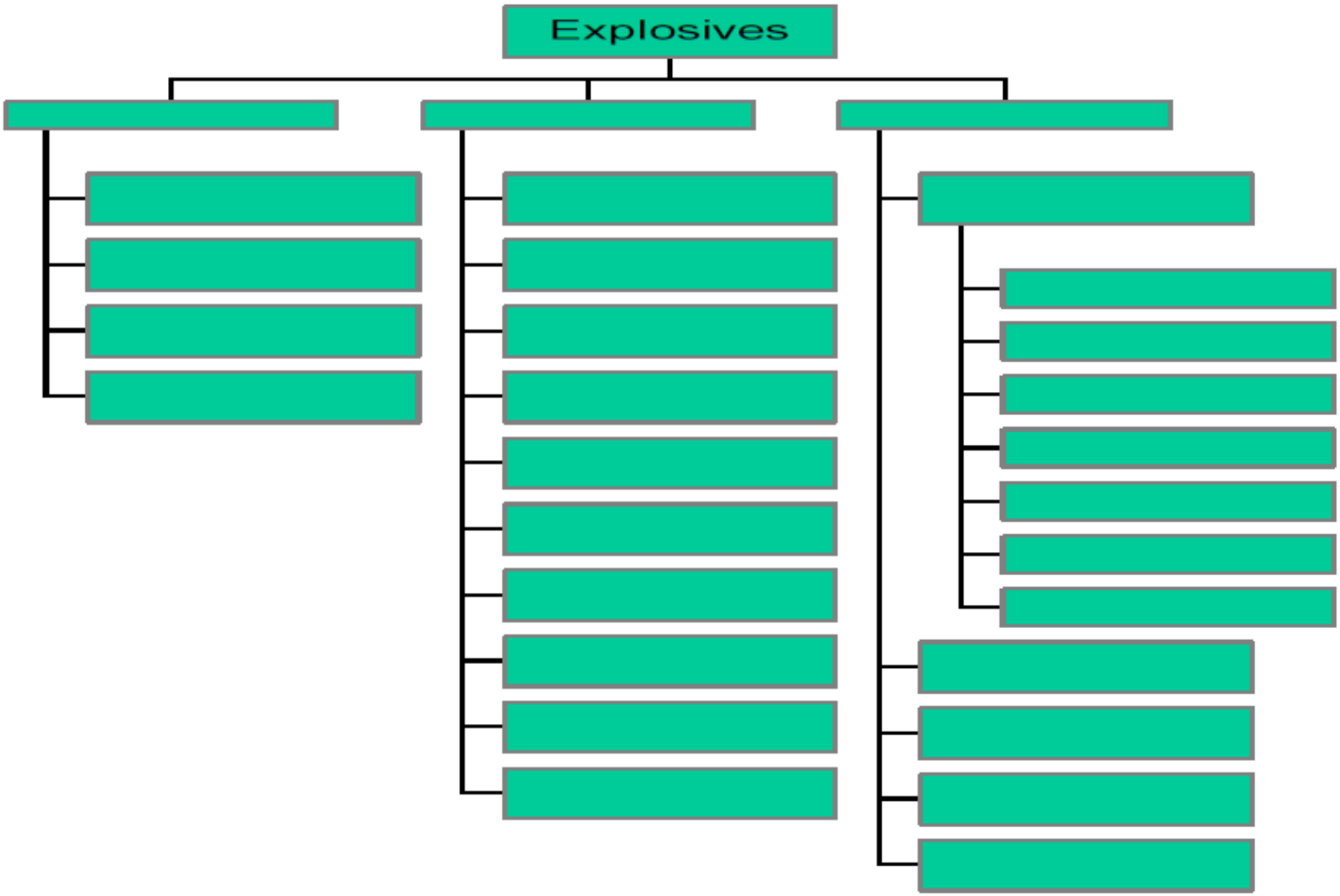
# WMD - Nuclear, Biological and Chemical Agents



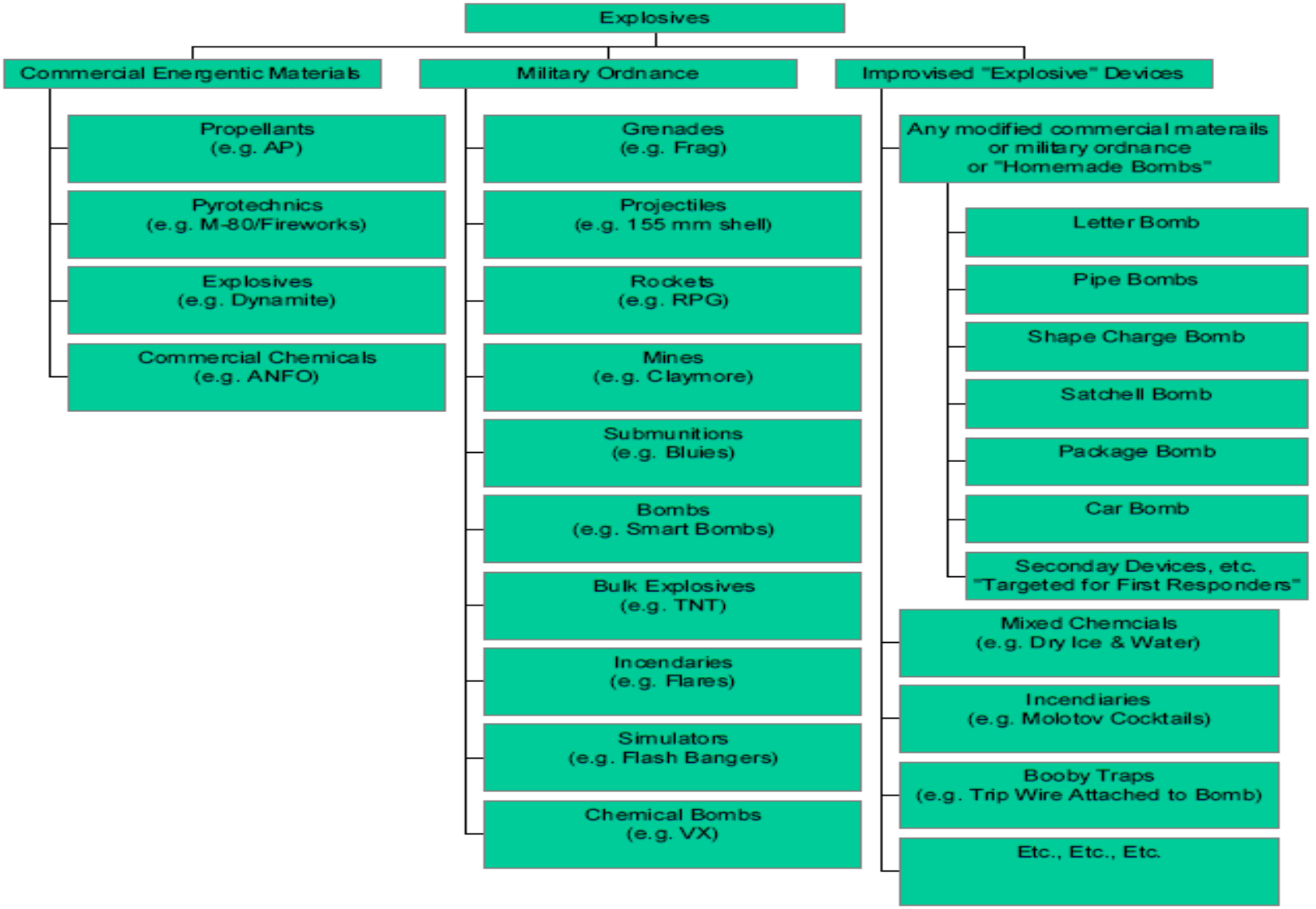
# WMD - Nuclear, Biological and Chemical Agents



# WMD-Explosives Weapons



# WMD-Explosives Weapons



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# FRO WMD

## Appendix C
## (Recognition Indicator Matrix)

# NBC RECOGNITION INDICATOR MATRIX

## HOW TO USE

1. Units arrive at scene where even at a distance multiple persons are affected.
2. Units should **"STOP – LOOK – LISTEN"** and relay observations to Dispatch.
3. On the MATRIX place a check mark in the "Indicator Present" column for each observed.
4. For every row in which the Indicator Present column is checked place another check mark in all un-Shaded boxes, including those with words inside the box.
5. At the bottom of each page: add the total number of check marks for each column; record as page totals; and transfer the totals to page 2. The column with the highest # of indicators should be considered the agent material most likely present.

| **APPEARANCE** (at a distance, # of people!) | **IP** | **RTC** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** |
|---|---|---|---|---|---|---|---|---|---|---|
| Prostration | | 1-1 | | | | | | | | |
| Involuntary twitching/jerking | | 1-2 | | | | | | | | |
| Convulsions | | 1-3 | | | | | | | | |
| Coma | | 1-4 | | | | | | | | |
| Confusion | | 1-5 | | | | | | | | |
| Bleeding from orifices (n,e,m,r) | | 1-6 | | | | | | | | |
| Coughing | | 1-7 | | | | | | | | |
| Sneezing, violent and persistent | | 1-8 | | | | | | | | |
| Vomiting | | 1-9 | | BLO | | | | | | |
| **SKIN** | | | | | | | | | | |
| Reddening of the lips and skin | | 2-1 | | | | | | | | |
| Blisters, painless (ask victim) | | 2-2 | | | | | | | | |
| Blisters, painful (ask victim) | | 2-3 | | | | | | | | |
| Grey area of dead skin does not blister | | 2-4 | | | | | | | | |
| Sunburn-like appearance (erythema) | | 2-5 | | | | | | | | |
| Pain, stinging/deep aching (ask victim) | | 2-6 | | | | | | | | |
| Clammy skin | | 2-7 | | | | | | | | |
| Skin, lesions, multiple pinpoint | | 2-8 | | | | | | | | |
| Hair loss, large quantities | | 2-9 | | | | | | | | |
| **EYES** | | | | | | | | | | |
| Pinpointing of pupils | | 3-1 | | | | | | | | |
| Enlargement of pupils | | 3-2 | | | | | | | | |
| Lesions | | 3-3 | | | | | | | | |
| Involuntary closing | | 3-4 | | | | | | | | |
| Tears or tearing | | 3-5 | | | | | | | | |
| Eyes, immediate burning/gritty feeling | | 3-6 | | | | | | | | |
| Pain in/above, aggravated by bright light | | 3-7 | | | | | | | | |
| Dimness of vision (ask victim) | | 3-8 | | | | | | | | |
| **RESPIRATORY** | | | | | | | | | | |
| Coughing-up of frothy sputum | | 3-9 | | | | | | | BLO | |
| Severe and uncontrollable coughing | | 3-10 | | | | | | | | |
| Hoarseness (may progress to loss of voice) | | 3-11 | | | | | | | | |
| Runny nose-copious | | 4-1 | | | | | | | | |
| Breathing Rate decreased | | 4-2 | | | | | | | | |
| Breathing Rate increased | | 4-3 | | | | | | | | |
| Breathing Depth increased | | 4-4 | | | | | | | | |
| Breathing, difficult (observed/ask) | | 4-5 | | | | | | | | |
| Dry Throat (ask victim) | | 4-6 | | | | | | | | |
| Tightness in chest (ask victim) | | 4-7 | | | | | | | | |

**EXAMINATION** (with protection if significant indicators above are found.)

| **CARDIOVASCULAR** | **IP** | **RTC** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** |
|---|---|---|---|---|---|---|---|---|---|---|
| Pulse Slow | | 4-8 | | | | | | | | |
| Blood pressure low | | 4-9 | | | | | | | | |
| Blood pressure high | | 5-1 | | | | | | | | |
| Heart action rapid and feeble | | 5-2 | | | | | | | | |
| Heart beat rapid | | 5-3 | | | | | | | | |
| Headache (ask victim) | | 5-4 | | | | | | | | |
| Headaches, **FRONTAL** (ask victim) | | 5-5 | | | | | | | | |
| Dizziness (ask victim) | | 5-6 | | | | | | | | |
| **DIGESTIVE SYSTEM (GL, GU GLANDS)** | | | | | | | | | | |
| Diarhea | | 5-7 | | BLO | | | | | | |
| Involuntary defecation and urination | | 5-8 | | | | | | | | |
| Nausea | | 5-9 | | | | | | | | |
| Localized Sweating | | 5-10 | | | | | | | | |
| Excessive Sweating | | 5-11 | | | | | | | | |
| **TEMPERATURE** | | | | | | | | | | |
| Fever | | 6-1 | | | | | | | | |
| Temperature, subnormal | | 6-2 | | | | | | | | |
| **HISTORY or ENVIRONMENTAL** | | | | | | | | | | |
| Odor-apple blossom | | 6-3 | | | | | | | | |
| Odor-pepper-like | | 6-4 | | | | | | | | |
| Odor-garlic | | 6-5 | | | | | | | | |
| Odor-horseradish | | 6-6 | | | | | | | | |
| Odor-bitter almonds (faint) | | 6-7 | | | | | | | | |
| Odor-sour fruit | | 6-8 | | | | | | | | |
| Odor-peach kernels (faint) | | 6-9 | | | | | | | | |
| Odor-new mown hay/fresh cut grass | | 6-10 | | | | | | | | |
| Odor-fruity to geranium like | | 7-1 | | | | | | | | |
| Unscheduled/unusual spray being dissem. | | 7-2 | | | | | | | | |
| Unusual Liquid Droplets, oily, no recent rain | | 7-3 | | | | | | | | |
| Abandoned spray devices | | 7-4 | | | | | | | | |
| Dead Animals, Birds, Fish | | 7-5 | | | | | | | | |
| Dead Weeds, Trees, Bushes, Lawns, etc. | | 7-6 | | | | | | | | |
| Illness assoc w/specific geo area, (victims have diff tx locations, work w/in same area | | 7-7 | | | | | | | | |
| Immediate Fatalities, not assoc/trauma | | 7-8 | | | | | | | | |
| Lack of Insect Life | | 7-9 | | | | | | | | |
| Low Lying Clouds not explained by surround | | 7-10 | | | | | | | | |
| Reports of colleagues, med community, media, etc., w/similar unexpalined illness | | 8-1 | | | | | | | | |
| TOTAL INDICATORS FROM PAGE 1 | | | | | | | | | | |
| **TOTAL INDICATORS FROM PAGE 2** | | | | | | | | | | |

A= NERVE AGENT
B= BLISTER AGENT
C= BLOOD AGENT
D= CHOKING AGENT
E= IRRITATING AGENT
F= INCAPACITATING AGENT
G= BIOLOGICAL AGENT
H= RADIOLOGICAL AGENT

1. Put on Respiratory Protection
2. Report all observations to dispatch
3. Report wind conditions (speed/direction)
4. Calm victims; HELP is on the way!!
5. Direct walking wounded to safe refuge
6. Touch nothing and no victim until in PPE
7. **REMAIN CALM**
8. **TOTAL INDICATORS OF ALL PATIENTS**

# Defense Protective Service
# NBC Indicator Matrix

(Place a check mark for each indicator noted at the incident in each unshaded box across the row for that indicator. At the bottom of each page total up the number of check marks made for each column and on the last page total up all page totals. Highest score is the indicator for which NBC material is involved)

| **Indicator Noticed by First Responder**<br><br>(These indicators are listed in the order in which the indicator would be noticed by first responding personnel to the scene of an NBC Emergency) | Nerve Agent | Blister Agents | Blood Agents | Choking Agents | Irritating Agents | Incapacitating Agents | Biological Agents | Radiological Materials |
|---|---|---|---|---|---|---|---|---|
| **APPEARANCE** | | | | | | | | |
| Prostration | | | | | | | | |
| Involuntary twitching & jerking | | | | | | | | |
| Convulsions | | | | | | | | |
| Coma | | | | | | | Anthrax | |
| Confusion | | | | | | | | |
| Bleeding from orifices (nose, ears, mouth, rectum) | | | | | | | Ebola | |
| Coughing | | | | | | | | |
| Sneezing, violent and persistent | | | | | | | | |
| Vomiting | | Bloody | | | | | | |
| | | | | | | | | |
| **TOTAL INDICATORS PAGE 1 *(Record on page 8)*** | | | | | | | | |

**Defense Protective Service**
**NBC Indicator Matrix**
**Page #2**

| **Indicator Noticed by First Responder** | Nerve Agent | Blister Agents | Blood Agents | Choking Agents | Irritating Agents | Incapacitating Agents | Biological Agents | Radiological Materials |
|---|---|---|---|---|---|---|---|---|
| **APPEARANCE** (up close, one on one. Approach with caution if indicators on page 1 are present) | | | | | | | | |
| **SKIN** | | | | | | | | |
| Reddening of lips & skin | | | | | | | | |
| Blisters, painless (ask victim) | | Mustard | | | | | | |
| Blisters, painful (ask victim) | | | | | | | | |
| Gray area of dead skin that does not blister | | | | | | | | |
| Sunburn-like appearance (erythema) | | | | | | | | |
| Pain, stinging or deep aching (ask victim) | | | | | | | | |
| Clammy skin | | | | | | | | |
| Skin, lesions, multiple pinpoint | | | | | | | | |
| Hair loss, large quantities | | | | | | | | |
| | | | | | | | | |
| **TOTAL INDICATORS PAGE 2** ***(Record on page 8)*** | | | | | | | | |

**Defense Protective Service**
**NBC Indicator Matrix**
**Page #3**

| Indicator Noticed by First Responder | Nerve Agent | Blister Agents | Blood Agents | Choking Agents | Irritating Agents | Incapacitating Agents | Biological Agents | Radiological Materials |
|---|---|---|---|---|---|---|---|---|
| **EYES** | | | | | | | | |
| Pinpointing of pupils | | | | | | | | |
| Enlargement of pupils | | | | | | | | |
| Lesions | | | | | | | | |
| Involuntary closing | | | | | | | | |
| Tears or tearing | | | | | | | | |
| Eyes, immediate burning sensation & gritty feeling | | | | | | | | |
| Pain in and above eyes, aggravated by bright light | | | | | | | | |
| Dimness of vision (ask victim) | | | | | | | | |
| **RESPIRATORY** | | | | | | | | |
| Coughing-up of frothy sputum | | | | | | | | |
| Severe and uncontrollable coughing | | | | | | | | |
| Hoarseness, (may progress to loss of voice) | | | | | | | | |
| **TOTAL INDICATORS PAGE 3** ***(Record on page 8)*** | | | | | | | | |

**Defense Protective Service**
**NBC Indicator Matrix**
**Page #4**

| Indicator Noticed by First Responder | Nerve Agent | Blister Agents | Blood Agents | Choking Agents | Irritating Agents | Incapacitating Agents | Biological Agents | Radiological Materials |
|---|---|---|---|---|---|---|---|---|
| **RESPIRATORY (Continued)** | | | | | | | | |
| Runny Nose - copious | | | | | | | | |
| Breathing Rate decreased | | | | | | | | |
| Breathing Rate increased | | | | | | | | |
| Breathing Depth increased | | | | | | | | |
| Breathing, difficult (observed or ask victim) | | | | | | | | |
| Dry Throat (ask victim) | | | | | | | | |
| Tightness in chest (ask victim) | | | | | | | | |
| ***EXAMINATION (WITH PROTECTION IF SIGNIFICANT INDICATORS ABOVE ARE FOUND)*** | | | | | | | | |
| **CARDIOVASCULAR** | | | | | | | | |
| Pulse slow | | | | | | | Equine | |
| Blood pressure low | | | | | | | | |
| | | | | | | | | |
| **TOTAL INDICATORS PAGE 4** ***(Record on page 8)*** | | | | | | | | |

**Defense Protective Service**
**NBC Indicator Matrix**
**Page #5**

| Indicator Noticed by First Responder | Nerve Agent | Blister Agents | Blood Agents | Choking Agents | Irritating Agents | Incapacitating Agents | Biological Agents | Radiological Materials |
|---|---|---|---|---|---|---|---|---|
| **CARDIOVASCULAR (Continued)** | | | | | | | | |
| Blood pressure high | | | | | | | Equine | |
| Heart action rapid & feeble | | | | | | | | |
| Heart beat, rapid | | | | | | | | |
| Headache (ask victim) | | | | | | | | |
| Headaches, frontal (ask victim) | | | | | | | | |
| Dizziness (ask victim) | | | | | | | | |
| **DIGESTIVE SYSTEM (GI, GU, Glands)** | | | | | | | | |
| Diarrhea | | Bloody | | | | | Cholera | |
| Involuntary defecation & urination | | | | | | | | |
| Nausea | | | | | | | | |
| Localized sweating | | | | | | | | |
| Excessive sweating | | | | | | | Tularemia | |
| **TOTAL INDICATORS PAGE 5** ***(Record on page 8)*** | | | | | | | | |

**Defense Protective Service**
**NBC Indicator Matrix**
**Page #6**

| Indicator Noticed by First Responder | Nerve Agent | Blister Agents | Blood Agents | Choking Agents | Irritating Agents | Incapacitating Agents | Biological Agents | Radiological Materials |
|---|---|---|---|---|---|---|---|---|
| **TEMPERATURE** | | | | | | | | |
| Fever | | | | | | | Typhoid | |
| Temperature, subnormal | | | | | | | | |
| **HISTORY or ENVIRONMENTAL (Not already observed or asked above)** | | | | | | | | |
| Odor - Apple blossom | | | | | | | | |
| Odor - Pepper-like | | | | | | | | |
| Odor - Garlic | | | | | | | | |
| Odor - Horseradish | | | | | | | | |
| Odor - Bitter almonds (faint) | | | | | | | | |
| Odor - Sour fruit | | | | | | | | |
| Odor - Peach kernels (faint) | | | | | | | | |
| Odor - New mown hay or freshly cut grass | | | | | | | | |
| | | | | | | | | |
| **TOTAL INDICATORS PAGE 6** ***(Record on page 8)*** | | | | | | | | |

**Defense Protective Service**
**NBC Indicator Matrix**
**Page #7**

| Indicator Noticed by First Responder | Nerve Agent | Blister Agents | Blood Agents | Choking Agents | Irritating Agents | Incapacitating Agents | Biological Agents | Radiological Materials |
|---|---|---|---|---|---|---|---|---|
| **HISTORY or ENVIRONMENTAL (Cont.)** | | | | | | | | |
| Odor - Fruity, geranium-like | | | | | | | | |
| Unscheduled & unusual spray being disseminated | | | | | | | | |
| Unusual liquid droplets, oily, no recent rain | | | | | | | | |
| Abandoned spray devices | | | | | | | | |
| Dead animals, birds, fish | | | | | | | | |
| Dead weeds, trees bushes, lawns, etc. | | | | | | | | |
| Illness associated with specific geographic area, i.e. victims have different treatment locations but all work within same area | | | | | | | | |
| Immediate fatalities not associated with trauma | | | | | | | | |
| Lack of insect life | | | | | | | | |
| Low-lying clouds not explained by surroundings | | | | | | | | |
| | | | | | | | | |
| **TOTAL INDICATORS PAGE 7** ***(Record on page 8)*** | | | | | | | | |

**Defense Protective Service**
**NBC Indicator Matrix**
**Page #8**

| Indicator Noticed by First Responder | Nerve Agent | Blister Agents | Blood Agents | Choking Agents | Irritating Agents | Incapacitating Agents | Biological Agents | Radiological Materials |
|---|---|---|---|---|---|---|---|---|
| Reports of colleagues, medical community, media, etc., with similar unexplained illness. | | | | | | | | |
| **Total** | | | | | | | | |
| *TOTAL INDICATORS FROM PAGE 1* | | | | | | | | |
| *TOTAL INDICATORS FROM PAGE 2* | | | | | | | | |
| *TOTAL INDICATORS FROM PAGE 3* | | | | | | | | |
| *TOTAL INDICATORS FROM PAGE 4* | | | | | | | | |
| *TOTAL INDICATORS FROM PAGE 5* | | | | | | | | |
| *TOTAL INDICATORS FROM PAGE 6* | | | | | | | | |
| *TOTAL INDICATORS FROM PAGE 7* | | | | | | | | |
| | | | | | | | | |
| **TOTAL INDICATORS OF ALL PAGES** | | | | | | | | |

***(Note: This process is an assessment of general indicators and should not be considered as an authoritative determination of the type of NBC Incident that is occurring. This process is only a guide for First Responders until a more technical assessment can be made.)***

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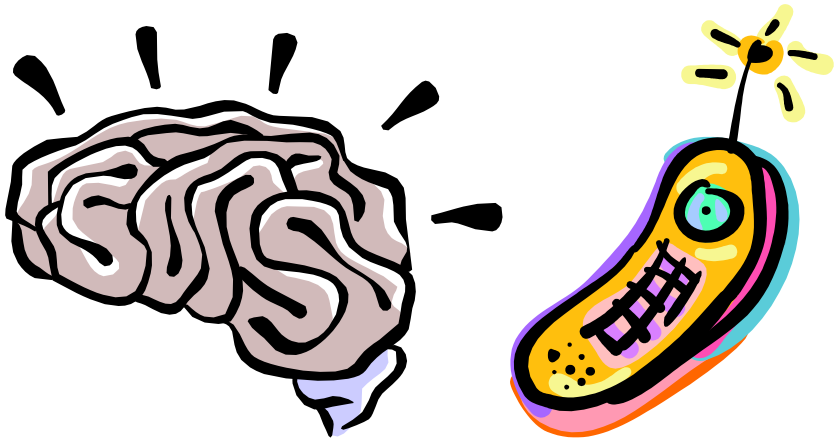
# FRO WMD

## Appendix D
## (FRO "SINDI" Mind Jogger & Notification List)



| **Mind Jogger/ SIN Acronym** | **X** | ***Actions/Notes*** |
|---|---|---|
| Safety | | |
| | | |
| | | |
| *Isolate* | | |
| | | |
| | | |
| *Notify* | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| **AGENCY** | N | B | C | E | Contact # | Comments |
|---|---|---|---|---|---|---|
| **LOCALS:** | | | | | | |
| ***Police/Sheriff Dept.*** | | | | | | |
| ***Fire Dept./EMS*** | | | | | | |
| ***Health*** | | | | | | |
| ***EOD*** | | | | | | |
| | | | | | | |
| **STATE:** | | | | | | |
| ***OES*** | | | | | | |
| ***CHP*** | | | | | | |
| ***OHS*** | | | | | | |
| **FEDS:** | | | | | | |
| ***FBI*** | | | | | | |
| ***FEMA*** | | | | | | |
| ***DHS*** | | | | | | |
| ***CDC*** | | | | | | |
| ***ATF*** | | | | | | |

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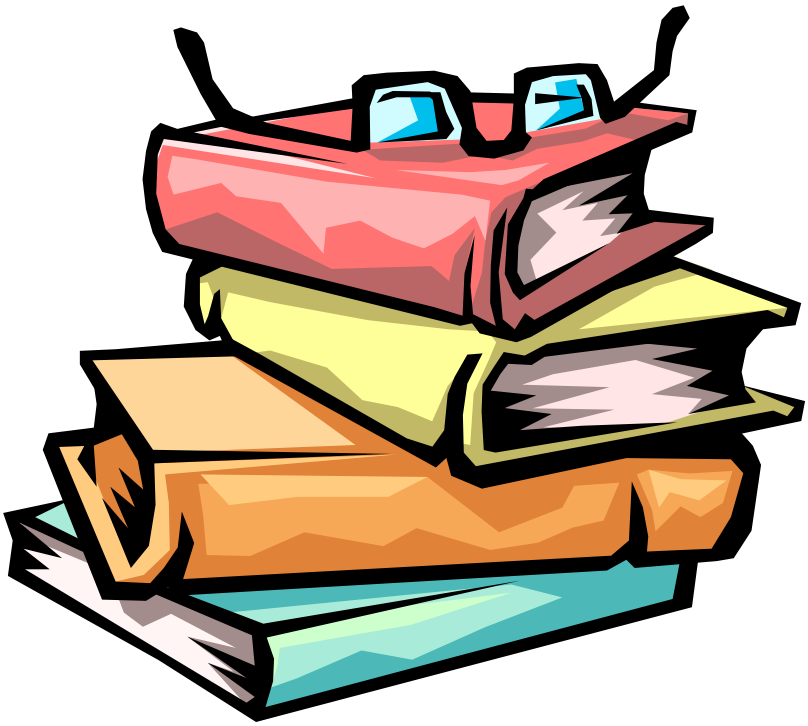
# FRO WMD

## Appendix E
## (NBC+E Bibliography)



**Due to the dynamic nature of WMD and NBC+E, information is constantly changing. To keep up to date on latest information, products, and policies we recommend you start at the following websites:**

**Federal Dept. of Homeland Security**
**www.dhs.gov**

**Chemical Biological Defense Information Center**
**www.cbiac.apgea.army.mil**

**Dept of Energy**
**www.energy.gov**

**U.S. Nuclear Regulatory Commission**
**www.nrc.gov**

**State OES**
**www.oes.ca.gov**

***NOTE:***
***The following pages are but a few books and links that you can investigate to gain more information regarding NBC+E agents.***

# BIBLIOGRAPHY for NUCLEAR Agents

**BOOKS:**

Bevelacqua, Armando & Stilp, Richard. *Hazardous Materials Field Guide*. Delmar Publishers, Albany, New York, 1998
A job aid/checklist for first responder general information, examples, etc., for the 9 UN Hazard Classifications.

Bevelacqua, Armando & Stilp, Richard. *Terrorism Handbook for Operational Responders*. Delmar Publishers, Albany, New York, 1998
General information for responders to recognize, detect and effectively respond to munitions, chemical agents, biological agents and nuclear terrorism.

*Emergency Response to Terrorism Job Aid*. FEMA, NFA & DOJ, Washington, D.C., 2000
A job aid/checklist for first responder general information, recognition clues and operational response recommendations for biological, nuclear, incendiary, chemical and explosive agents.

*NBC Field Handbook.* U. S. Army Field Manual FM 3-7, 1992

*Transport of Radioactive Materials.* FEMA, Washington, D.C., 2000
A booklet written to answer questions most frequently asked by firefighters, law enforcement officials and other first responders to nuclear incidents.

**LINKS:**

California Department of Health Services
***http://www.dhs.ca.gov***
Emergency Response Guidebook 2000
***http://hazmat.dot.gov/gydebook.hmt***
Federation of American Scientists (FAS)
***http://www.fas.org/nuke/intro/bw/index.hmtl***
FEMA Publication Center
***http://www.fema.gov/library/publicat.htm***
Nuclear, Chemical, Biological Information
***http://www.chem-bio.com***
Nuclear Regulatory Comission
***http://www.nrc.gov***
U.S. Department of Transportation (Research & Special Programs Admin DHM51)
***http://www.rspa.dot.gov***
U.S. DOE – Office of Scientific & Technical Information
***http://www.osti.gov/ostipg.html***

# BIBLIOGRAPHY for BIOLOGICAL Agents

**BOOKS:**

Bevelacqua, Armando & Stilp, Richard. *Terrorism Handbook for Operational Responders*. Delmar Publishers, Albany, New York, 1998
General information for responders to recognize, detect and effectively respond to munitions, chemical agents, biological agents and nuclear terrorism.

*Emergency Response to Terrorism Job Aid*. FEMA, NFA & DOJ, Washington, D.C., 2000
A job aid/checklist for first responder general information, recognition clues and operational response recommendations for biological, nuclear, incendiary, chemical and explosive agents.

*Jane's Chem-Bio Handbook*. Jane's Information Group, Alexandria, Virginia, 1998
A guide for information, effects, treatment, recognition and on-scene procedures chemical and biological agents.

*NBC Protection.* U. S. Army Field Manual FM 3-4, 1992

*Toxic Terror: Assessing Terrorists Use of Chemical and Biological Weapons*. Johnathan B. Tucker, Cambridge: MIT Press, 2000
Book provides in-depth case studies of 12 terrorist groups that are currently seeking to deploy biological weapons.

**LINKS:**

California Department of Health Services
***http://www.dhs.ca.gov***
Centers for Disease Control
***http://www.bt.cdc.gov***
Emergency Response Guidebook 2000
***http://hazmat.dot.gov/gydebook.hmt***
Federal Bureau of Investigation
***http://www.fbi.gov***
Federation of American Scientists (FAS)
***http://www.fas.org/nuke/intro/bw/index.hmtl***
FEMA Publication Center
***http://www.fema.gov/library/publicat.htm***
Nuclear, Chemical, Biological Information
***http://www.chem-bio.com***
U.S. Department of Human and Health Services
***http://www.hhs.gov***

# BIBLIOGRAPHY for CHEMICAL Agents

**BOOKS:**

Bevelacqua, Armando & Stilp, Richard. *Hazardous Materials Field Guide*. Delmar Publishers, Albany, New York, 1998
A job aid/checklist for first responder general information, examples, etc., for the 9 UN Hazard Classifications.

Bevelacqua, Armando & Stilp, Richard. *Terrorism Handbook for Operational Responders*. Delmar Publishers, Albany, New York, 1998
General information for responders to recognize, detect and effectively respond to munitions, chemical agents, biological agents and nuclear terrorism.

*Chemical Operations, Principles and Fundamentals*, U.S. Army Field Manual FM 3-100, 1996

*Emergency Response to Terrorism Job Aid*. FEMA, NFA & DOJ, Washington, D.C., 2000
A job aid/checklist for first responder general information, recognition clues and operational response recommendations for biological, nuclear, incendiary, chemical and explosive agents.

*Field Behavior of NBC Agents*, U.S. Army Field Manual FM 3-6, 1986

*Hazardous Materials Handbook*. Meidl, James H., Glencoe Press, Beverly Hills, California, 1972

*Jane's Chem-Bio Handbook*. Jane's Information Group, Alexandria, Virginia, 1998?
A guide for information, effects, treatment, recognition and on-scene procedures chemical and biological agents.

*Management of Chemical Warfare Agent Casualties*, Frederick R. Sidell, M.D.

*Potential Military Chemical/Biological Agents and Compounds*, U.S. Army Field Manual FM 3-9, 1996

*Proceedings of the Seminar on Responding to the Consequences of Chemical and Biological Terrorism*, U. S. Public Health Service, July 11-14, 1995

**LINKS:**

Emergency Response Guidebook 2000
***http://hazmat.dot.gov/gydebook.hmt***

Federal Bureau of Investigation
***http://www.fbi.gov***

FEMA Publication Center
***http://www.fema.gov/library/publicat.htm***

Nuclear, Chemical, Biological Information
***http://www.chem-bio.com***

# BIBLIOGRAPHY for EXPLOSIVE Agents

BOOKS:

Brodie, Thomas G. *Bombs, Bombing and Bomb Disposal Study Guide*. David Publishing Co., Springfield, Illinois, 1974
Contains more than 590 questions and answers regarding the duties of the citizen, officer, and supervisor at the bomb scene.

Brodie, Thomas G. *Bombs and Bombings*. Charles C. Thomas, Publisher, Springfield, Illinois, 1972
Focuses on bomb detection, disposal, and investigation; also equipment, training, and bomb formation is discussed.

Cook, Melvin A. *The Science of High Explosives*. Robert E. Krieger Publishing Co., Inc., Huntington, New York, 1971
Deals with the chemistry of detonating explosives and major developments in detonation theory.

Davis, Tenney Lombard. *The Chemistry of Powder and Explosives*. Angriff Press, Hollywood, California, 1975
Includes information pertaining to black powder, pyrotechnics, aromatic nitro compounds, nitric esters, smokeless powder, dynamite and other high explosives, detonators and primers.

*Emergency Response to Terrorism Job Aid*. FEMA, NFA & DOJ, Washington, D.C.?, 2000
A job aid/checklist for first responder general information, recognition clues and operational response recommendations for biological, nuclear, incendiary, chemical and explosive agents.

Knowles, Graham. *Bomb Security Guide*. Security World Publishing Co., Inc., Los Angeles, California, 90034, 1976
A step-by-step emergency response program against bomb threats and letter bombs.

Lenz, Robert R. *Explosives and Bomb Disposal Guide*. Charles C. Thomas, Publisher, Springfield, Illinois, 1970
The characteristics of explosives and military munitions are presented with explanatory methods of initiation; also booby traps and rendering safe and the disposal of explosive devices.

Meidl, James H. *Explosive and Toxic Hazardous Materials*. Glencoe Press, Beverly Hills, California, 1970
Examines why materials explode, why they are unstable and how they react with water, air, etc.

Meyer, Rudolf. *Explosives*. Verlag Chemie, New York, 1977
Fundamental information on explosives for both the expert and the general public; describes the properties, manufacturing methods, and applications of over 1500 substances.

Pickett, Mike. *Explosives Identification Guide*. Delmar Publishers, Albany, New York, 1998
A reference guide to aid first responders in recognizing commercial and military explosives, as well as booby traps and a basic response checklist.
Books (cont.):

Pike, Earl A. *Protection Against Bombs and Incendiaries*. Charles C. Thomas, Publisher, Springfield, Illinois, 1972
Includes protective measures to reduce the threat of bombs and incendiaries to personal and physical resources.

Powell, William. *The Anarchist Cookbook*. Lyle Stuart, Inc., 239 Park Avenue South, New York, New York, 10003
An undergound publication for the urban guerrilla.

Saxon, Jurt. *The Poor Man's James Bond*. Atlan Formularies, Box 438, Eureka, California, 95501, Sixth Edition, 1972
An underground publication of the urban guerrilla.

Stoffel, Joseph. *Explosives and Homemade Bombs*. Charles C. Thomas, Publisher, Springfield, Illinois, 1972
Designed for the occasional bomb disposal technician; uses non-technical language in discussing explosives and homemade bombs.

Styles, George. *Bombs Have No Pity*. Tinling Ltd., Prescott, London, England, 1975
Autobiography of Lieutenant Colonel George Styles, who was awarded the George Cross in 1972 for his work in Northern Ireland.

**LINKS:**

Emergency Response Guidebook 2000
***http://hazmat.dot.gov/gydebook.hmt***
FEMA Publication Center
***http://www.fema.gov/library/publicat.htm***
U.S. Department of Transportation (Research & Special Programs Admin DHM51)
***http://www.rspa.dot.gov***
U.S. ATF –
***http://www.atf.gov***

***NOTE:***
*CSTI has additional handouts available upon request for "Terrorism" web sites.*