

**DEPARTMENT OF HOMELAND SECURITY  
FEDERAL EMERGENCY MANAGEMENT AGENCY**

**NATIONAL  
URBAN SEARCH AND RESCUE  
RESPONSE SYSTEM**

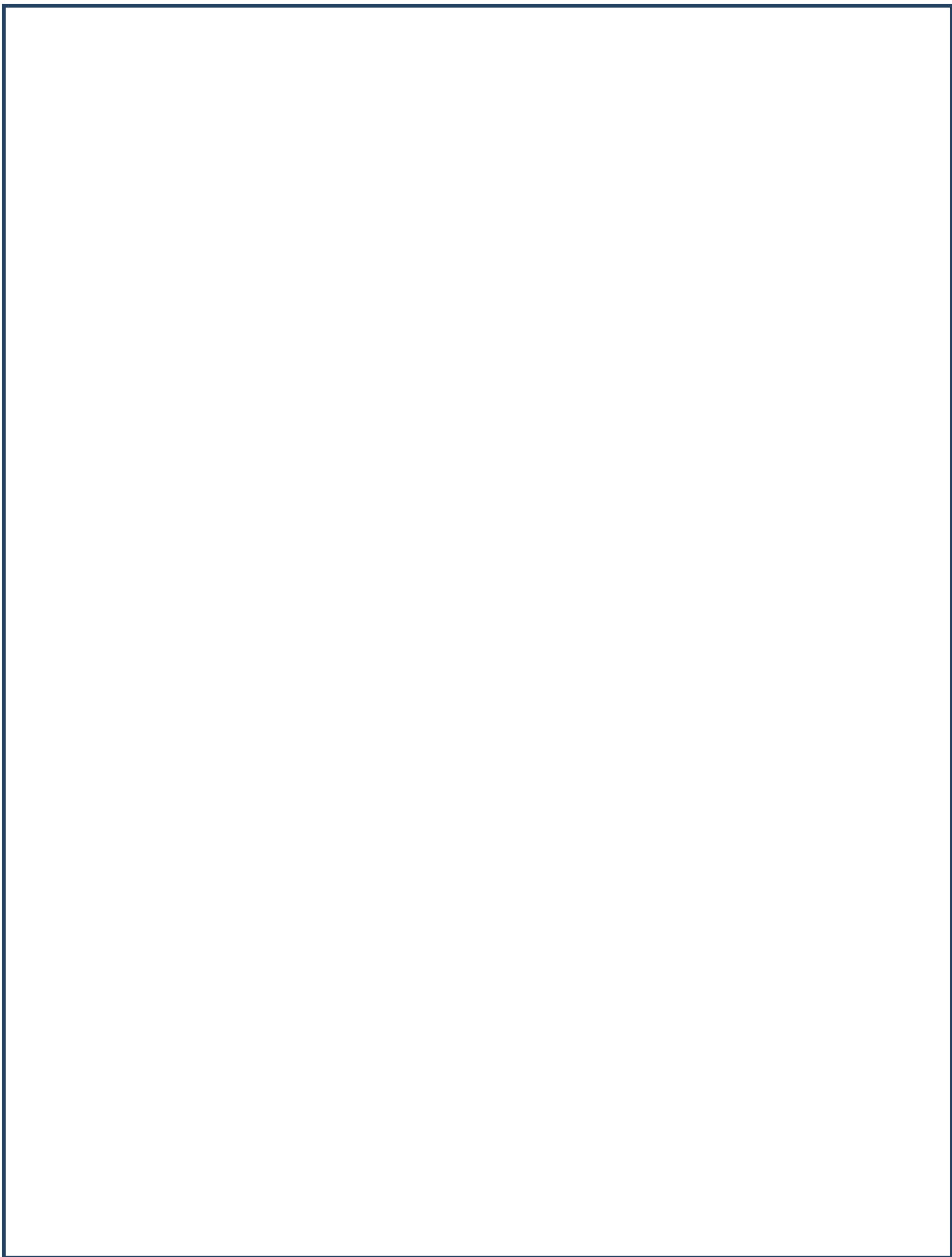
A Component of the National Response Framework  
Emergency Support Function 9



National US&R Response System Operations Manual

**ANNEX B**  
**Concept of Operations**  
US&R Operations in a  
Contaminated Environment  
(US&R Hazmat Operations)

**October 2013**



## Record of Revisions

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10/18/2013	Added Appendix G - Radiation Exposure Tracking Aide Sample



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## US&R OPERATIONS IN A CONTAMINATED ENVIRONMENT

### CONCEPT OF OPERATIONS

#### CHAPTER 1: INTRODUCTION

##### **1-1. Purpose**

Annex B, Concept of Operations for US&R Operations in a Contaminated Environment describes the organization, function, tasks, and considerations for the Federal Emergency Management Agency's (FEMA), National Urban Search and Rescue Response System (US&R) Task Forces response within contaminated environments.

This Hazmat Annex to the US&R Operations Manual describes US&R's capabilities in contaminated Search and Rescue (SAR) environments as part of Federal operations in support of state, local, and tribal authorities. This plan articulates the US&R mission and describes how Federal preparedness and response capabilities support all partners to achieve the highest level of readiness to reduce the loss of life and property. The Hazmat Annex complements the US&R Operations Plan and presents a full description of the concept of operations, including specific roles and responsibilities, tasks, integration, and actions required.

##### **1-2. Mission**

FEMA's primary mission is to reduce the loss of life and property and protect the nation from all hazards caused by man or nature. The National US&R Response System performs a major role in preparation for and response to disasters that exceed local and state capabilities to provide adequate search and rescue services. These search and rescue services may include conducting SAR operations within contaminated environments. Hazmat Specialists are assigned to the task force to ensure the health and safety of task force members, survivors, and rescuers. This objective can be accomplished through the application of limited monitoring, detection, and contamination-reduction capabilities.

##### **1-3. Situation**

The FEMA US&R task forces are established and equipped to locate, extricate, and provide immediate medical treatment to survivors entrapped by structural collapse. This mission includes response to both manmade and naturally occurring disasters. History has shown that during such events, operations in contaminated areas are intrinsic to the Search and Rescue (SAR) environment. The release of hazardous materials may result from man-made and natural disasters, or may be present within a site's normal environment. The health and safety of rescuers is of paramount concern and is the primary focus of the task force Hazmat Specialists.

Preparation for, response to, recovery from, and the mitigation of a contaminated SAR environment all require a coordinated response among Federal, state, local, and tribal governments. Non-governmental organizations and private sector resources may also be requested for support.

#### **1-4. Background**

The National US&R Response System was established in 1989 and placed under the authority of FEMA in response to earthquakes in California. The System's mission has since expanded to include other natural disasters and man-made disasters. The Type I US&R Task Force has also grown from the initial 56 members in 1990, to 62 members, and then to 70 members—adding eight (8) Hazmat Specialist positions in 2003 to augment the two previously-rostered Hazmat Specialists.

The initial focus and mission for US&R resources has also expanded since the inception of the program to include response to man-made and natural disasters covering large geographical areas and standby activities associated with National Security Special Events (NSSE). Experience regarding response to hurricanes and collapsed or damaged structures has demonstrated the need for US&R task forces to be fully prepared to operate in contaminated environments. In 2008, Hurricane Ike reinforced the possibility of having to conduct SAR operations in and near petro-chemical facilities impacted by hurricanes.

#### **1-5. Assumptions**

Conducting SAR operations within contaminated environments is dangerous and challenging. US&R task forces must assume the following while operating in those environments:

- **The health and safety of task force members is the top priority.** Hazard and risk assessments conducted by Hazardous Materials Specialists, in conjunction with Medical Specialists and Safety Officers, are critical and will dictate whether a defensive or offensive posture is taken.
- US&R task forces may have an extended response time to the incident.
- Local first responders may not have conducted an initial site characterization prior to a task force arrival. Therefore, US&R task forces will be required to conduct an independent site characterization prior to commencing operations.
- US&R task forces carry a limited supply of atmospheric monitors and personal protective equipment (PPE).
- In addition to Hazardous Materials Equipment Push Packages (HEPP), which are described in detail in Chapter 4 of this manual, US&R task forces may also require



logistics support to continue extended SAR operations in contaminated environments. Logistics support includes, but is not limited to, the following:

- Water for decontamination
  - Definitive site characterization from other agencies
  - Analytical support services
  - Hazardous waste and wastewater removal services
- Standards and procedures for Hazmat operations will meet existing regulatory guidelines and follow safe operating practices for contaminated environments.
  - The information presented in NFPA 1994, “Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents” 2007 edition, is critical when providing support for the health and safety of US&R members.
  - FEMA will cache Hazmat equipment and supplies at designated US&R Hazmat Equipment Push Packages (HEPPs) task force locations.
  - Current US&R task force Hazmat PPE inventory is intended to sufficiently equip SAR operations in a contaminated environment for a maximum of 12 continuous hours. The deployment and arrival of one US&R HEPP increases the period of time to operate in a contaminated environment to 36 hours. The standard 72-hour self-sufficiency policy for non-Hazmat related equipment and supplies still applies.
  - Operational safety concerns include the following:
    - Site characterization and site safety plans
    - Modified work cycles and medical surveillance

US&R task forces will be operating within a unified command structure and will be working with responders from all levels of government. These responders may include, but are not limited to, the following:

- Local fire department Hazmat teams
- State Hazmat teams
- Environmental Protection Agency (EPA)
- Department of Justice (DOJ)
- Department of Defense (DoD), including the following:

- National Guard Bureau Civil Support Teams (CST)
  - Chemical Enhanced Response Force Package Teams (CERFP)-National Guard
  - Homeland Response Force (HRF)
  - Chemical, Biological Incident Response Force (CBIRF)-U.S. Marine Corps
- 
- Department of Energy (DOE)
  - Department of Labor (DOL)-Occupational Safety and Health Administration (OSHA)
  - Department of Homeland Security (DHS)
  - United States Coast Guard (USCG)
  - Customs and Border Protection (CBP)
  - Department of Health and Human Services (DHHS), including the National Disaster Medical System (NDMS)
  - Centers for Disease Control (CDC)
  - Department of Interior (DOI)

#### 1-6. **Staffing**

Type I task forces are staffed with 70 members, 10 of whom are Hazmat Specialists, in accordance with National Incident Management System (NIMS) typing. This organizational structure includes two Hazmat Team Managers, as illustrated in the Task Force Organizational Chart on the following page of this manual.

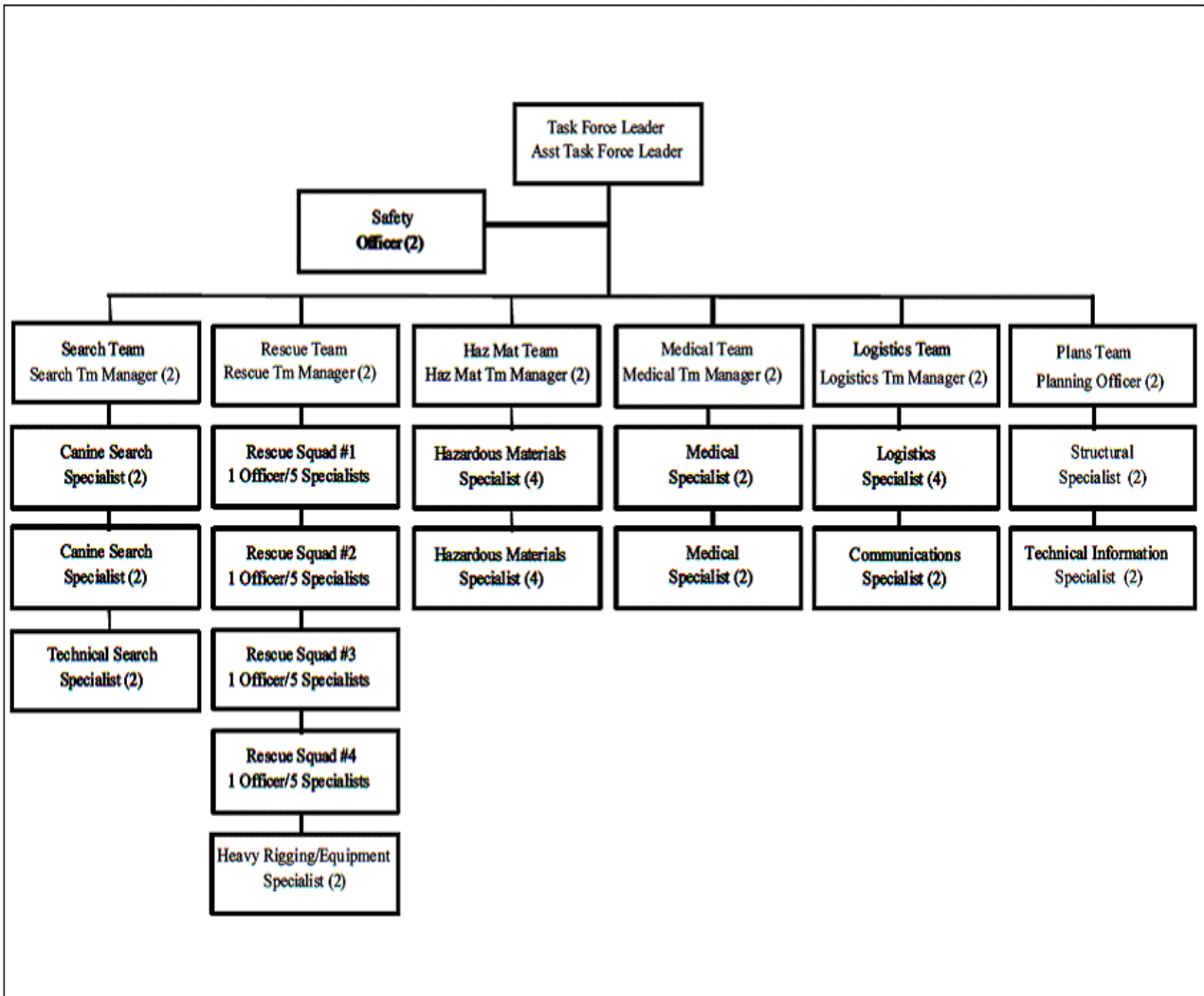
Each task force will use its complement of Hazmat personnel in the way that best suits their operational needs at the time. A typical deployment model may be configured as follows:

- **Hazmat Team Managers x 2** to ensure the safety and coordination of the SAR operation in a contaminated environment
- **Hazmat Specialists x 2** assigned to the protection of Reconnaissance and Structural Triage Teams, as well as providing continuous site characterization
- **Hazmat Specialists x 4** assigned to the Rescue Squads—one for each of the four squads

- **Hazmat Specialists x 2** assigned to coordinate decontamination operations

The task force is organized according to the requirements of the mission and situation. The Task Force Leader (TFL) may revise or change the organization of the task force before or during an incident. All task force personnel must be flexible and able to adapt to unconventional and dynamic situations.

**TYPE I Task Force  
 Organizational Chart**



All task force members receive basic training regarding response to hazardous materials incidents, Hazmat recognition, use of equipment, and decontamination procedures. The Medical Specialists and Hazmat Specialists also receive advanced training in their disciplines, relative to specific Hazmat situations.

## 1-7. Current Operational Capabilities

Using a combination of protective clothing and detection equipment, US&R task forces are appropriately equipped, trained, and organized to accomplish the following assignments within contaminated environments:

### I. Task Force Capabilities

US&R task forces are trained and equipped to perform the following operations:

- Presumptively characterize a contaminated rescue site
- Decontaminate task force personnel and a limited number of survivors
- Perform limited debris pile tunneling\*
- Perform limited breaching\*
- Perform limited shoring\*
- Perform limited search\*
- Perform limited survivor rescue/extraction\*
- Perform limited survivor and US&R personnel medical treatment
- Shut off working valves
- Perform other US&R functions in which engineered controls can be used to manage the environment or limit the risk of protective equipment failure

**\* Note: Limiting factors are determined by the capability and availability of the Personal Protective Equipment (PPE) for the environmental conditions.**

### II. Operations Outside of Task Force Capabilities

US&R task forces are not equipped, nor intended to operate, as a Hazmat team. The following operations are **not** conducted by US&R task forces, due to personnel staffing and equipment limitations:

- Bonding and grounding operations
- Plugging and patching operations
- Off-loading
- Capping
- Flaring
- Definitive chemical agent identification (beyond presumptive determination)

- Absorbing or removing materials (The use of dirt or other onsite materials to absorb small amounts of liquids is possible.)
- Site mitigation
- Mass decontamination
- Containment for more than 1000 gallons of contaminated decontamination water

### **III. Hazmat Equipment Push Packages (HEPP)**

FEMA US&R has established seven (7) Hazmat equipment caches to supplement task force operations when operating in contaminated environments. These caches are referred to as Hazmat Equipment Push Packages, or HEPP.

One HEPP will provide enough additional PPE to allow one task force to extend operations in a contaminated environment from one 12-hour period to one 36-hour period. (See Chapter 4 for detailed information)



## CHAPTER 2: EXECUTION

### 2-1. Expectation

The National US&R Response System was established to provide the capability to perform search and rescue operations. Consistent with FEMA’s “All Hazards” approach, and as an integral part of the response to incidents caused by man or nature, US&R teams are expected to be equipped, trained, and prepared to operate in a contaminated environment.

A contaminated environment may include, but is not limited to, incidents involving the intentional or accidental release of any hazardous materials, such as Chemical, Biological, Radiological, Nuclear, or High Explosive (CBRNE) materials. US&R task forces are expected to have the requisite knowledge, skills, and abilities to develop a risk management plan that provides the highest level of SAR services without putting members at unreasonable risk.

### 2-2. Concept of Operation

#### I. Preparedness Phase

To identify threat conditions, the U.S. Department of Homeland Security has developed the National Terrorism Alert System (NTAS). The NTAS assists responders in preparing for response to an incident involving terrorist acts committed against facilities and the citizens who occupy them. In the event of such an incident, the Federal government will take specific actions, which are synchronized to each threat level, to ensure that all Federal agencies are operating with jointly and consistently executed plans. The following paragraphs describe the DHS threat conditions matrix and recommended US&R Hazmat preparedness actions.

#### A. Elevated Condition

An elevated condition warns of a credible terrorist threat against the United States and is declared when a significant risk of terrorist attacks exists. Although protective measures may have been taken under previous threat conditions, Federal departments and agencies should consider the following general measures in addition to the protective measures that they will develop and implement:

- Assume normal task force Hazmat operations.
- Expedite Hazmat equipment repairs, maintenance, and return to service.
- Take the following actions if placed on Alert Status:
  - Ensure readiness of Hazmat equipment.

- Package Hazmat equipment for easy deployment. (Consider preparation of rapid-deployment Hazmat kits for immediate operations upon arrival.)

## B. Imminent Threat

An imminent threat warns of a credible, specific, and impending terrorist threat against the United States. Under most circumstances, the protective measures taken in response to an imminent threat are not intended to be sustained for substantial periods of time.

Federal departments and agencies should consider executing the following general measures in addition to the agency-specific protective measures that they will develop and implement:

- Increase or redirect personnel to address critical emergency needs.
- Perform “just-in-time” refresher/mission-specific training for appropriate personnel.
- Ensure readiness of Hazmat equipment.
- Package Hazmat equipment for easy deployment. (Consider preparation of rapid-deployment Hazmat kits for immediate operations upon arrival.)

## II. Deployment Phase

Upon receipt of a FEMA US&R Activation Order, task forces should implement the following pre-deployment procedures:

### A. At Point-of-Assembly

- Medical
  - Initiate pre-deployment medical surveillance of task force members.
  - Initiate or review medical site intelligence.
  - Address the issue of prophylactic medications.
  - Evaluate the need for issuing antidote kits (3 DuoDotes™, 1 Convulsive Anti Nerve Agent (CANA) packaged in a Pelican case).
- Initiate Radiological Legal Dose of Record procedure. (Refer to Appendix E US&R Standard Radiological Response Operating Guidelines.)
- Logistics



- Package Hazmat equipment for easy access during deployment.
- Ensure that personnel have immediate access to issued respiratory protection and remind personnel to keep respiratory protection on their person in emergency donning mode at all times.
- Consider issuing detection equipment to Hazmat personnel assigned to recon function.
- Operational Security
  - Gather and analyze Hazmat intelligence.
  - Provide task force Hazmat briefing.

#### B. In-Transit

- Maintain heightened level of situational awareness.
- Attempt to gather additional intelligence using open-source documents, reach-back capability, news broadcasts, etc.
- Ensure that at least one HEPP is being deployed to the incident.

#### C. Base of Operations (BoO)

- Perform site safety inspections in conjunction with Safety Officer, Structural Specialist, and Hazmat Manager.
- Provide contamination reduction measures for all personnel and equipment entering the Base of Operations.
- Continuously monitor for hazardous conditions within the BoO.

#### D. Defensive vs. Offensive Operations

US&R TFLs, in consultation with appropriate team specialists, will determine whether offensive or defensive operations are appropriate based on a site assessment, the level of training of personnel, and equipment capability.

**Defensive Operations** are defined as the precautionary and emergency measures taken to prevent, avoid, or minimize possible exposure to the release of a chemical, biological material, incendiary device/compound, radiological material, and/or detonation of an explosive device. When conducting defensive operations, task forces shall implement the following procedures:

- Perform reconnaissance for site characterization and to identify control zones.

- Maintain immediate access to appropriate PPE, including National Fire Protection Association (NFPA) (NFPA 1994 [2007]) compliant ensembles and antidotes (DuoDote™ and CANA) for self or buddy administration.
- Establish an emergency decontamination capability.
- Establish escape routes and safe refuge areas.

Defensive actions may be required when circumstances outside the scope of existing training, equipment, and/or support capability exist and adequate protection of personnel is not possible.

**Offensive Operations** are defined as any operation in which personnel are committed to a known or probable contaminated environment. When conducting offensive operations, task forces may take the following actions:

- Perform reconnaissance, search, and rescue of survivors.
- Attempt to manage existing hazards in order to maintain an acceptable level of risk.

Offensive actions may be possible in situations where protective equipment is adequate and available. Again, specific task assignments may or may not be possible depending on the equipment needs and personnel performance limitations imposed by protective equipment.

#### E. On-Site Operations

Once on-site, task force personnel may be required to interface with the US&R IST, Federal, state, and local officials/responders, as well as authorities responsible for intelligence, site security, and the development of evidence preservation guidelines. SAR operations in a contaminated environment will require the Task Force Leader to accomplish the following objectives:

- Confirm the delivery of the HEPP with the IST Logistics Section Chief or Task Force Logistics Team Manager.
- Ensure the establishment of an initial capability to provide emergency decontamination, Rapid Intervention Team (RIT), and medical treatment.
- Conduct structural triage, and reconnaissance operations:
  - Assign a Hazmat Specialist to each Recon Team to provide direct monitoring and hazard evaluation.
  - Ensure that an initial site characterization is conducted by the Hazmat Specialists prior to deployment of any advance teams (if available intelligence indicates known contamination).

- Use detection/monitoring equipment appropriate to potential hazards.
- Determine PPE requirements.
- Establish control zones and access control points.
- Identify rescue opportunities (determine complexity).
- Pre-Plan appropriate equipment and PPE for “emergency decon operations”.
- Conduct search operations:
  - Perform search operations within the limits of PPE requirements and restrictions.
  - Deploy canines with the understanding that their mission or capabilities may be limited due to the contaminated environment.
- Perform rescue operations:
  - Assign a Hazmat Specialist to each Rescue Squad to provide direct monitoring and hazard evaluation.
  - Organize the rescue site with the establishment of control zones and a decontamination capability.
  - Perform rescue operations within the limits of PPE requirements and restrictions.
  - Consider using more compressed work cycles.
- Execute decontamination operations:
  - Implement task force decontamination capabilities, which are intended for task force personnel and a limited number of survivors rescued by the task force(s).
  - Pre-Plan contamination reduction procedures for all phases of offensive and defensive US&R operations.
  - Staff the decontamination corridor under the supervision of Hazmat Specialists. Any task force member may be required to assist with decontamination.
  - Assign appropriate monitoring equipment to the decontamination corridor.
  - Secure support from local jurisdictions, the National or Regional Response Coordination Center (NRCC or RRCC), the HEPP, or other

agencies for water supply, contaminated water removal, and self-contained breathing apparatus (SCBA) refill.

- Record all suspected exposure and related decontamination on the proper forms as per Sponsoring Agency.
- Conduct Medical Operations
  - Continue medical monitoring of patients during rescue, decontamination, and treatment while under the care of the task force.
  - Use on-going medical site and personnel surveillance to evaluate factors that may affect health and safety of personnel and canines.
  - Maintain medical surveillance of task force members including the following:
    - Short term – during deployment
    - Intermediate term – up to 30 days post-demobilization
    - Long term – beyond the Intermediate term
  - Perform follow-up treatment based on site assessments, contaminant analysis, and updated information.

### **III. Demobilization Phase**

- US&R task forces will decontaminate all equipment used in the contaminated environment prior to demobilization.
- Based on recommendations from the IST, task forces may be requested to collect equipment, PPE, and uniforms prior to leaving the site, for disposal coordinated by the IST.
- Vehicle safety inspection and decontamination shall be completed prior to task force departure.
- Coordinate with Logistics and Medical Managers for the collection and shipment of the RadWatches back to the manufacturer for reading. (Refer to Appendix E US&R Standard Radiological Response Operating Guidelines.)
- Coordinate with the IST LSC or the Logistics Manager for the return of the HEPP, if deployed.

#### IV. Return-to-Readiness Phase

- US&R task forces will complete and collect all Federal Traumatic Injury forms (CA-1) and Notice of Occupational Disease and Claim for Compensation forms (CA-2), and all other associated Worker's Compensation forms that are used for employee injury and exposures .
- Post-Mission Medical Screening will be accomplished according to mission specifics outlined by the IST Medical Manager and/or National US&R Branch. US&R Program Directive 2005-008, Task Force Medical Screening, may be used as a guide to determine the extent of Post-Mission Medical Screening.
- US&R task forces will rehab and reconstitute the complete cache to a state of readiness as soon as possible upon return to their home base.
- US&R Program Managers, in coordination with their Logistics Managers, shall ensure that RadWatches are read by the manufacturer and badges and certificates are returned to the task force.
- Upon return of the RadWatches and certificates, each deployed task force member will coordinate with his/her own agency's occupational health services coordinator to properly record or file an exposure report. Personnel should maintain a copy of this record in their personal files for future reference as needed. (Refer to Appendix E, US&R Standard Radiological Response Operating Guidelines.)



## CHAPTER 3: ADMINISTRATION

### 3-1. **Objective**

The primary concern of task force management is the safety of its members. To achieve this objective, specific preparedness and readiness actions must be in place.

### 3-2. **Medical Baseline Requirements**

Refer to US&R Program Directive 2005-008, Task Force Medical Screening (or subsequent directive) to determine baseline medical requirements.

### 3-3. **Training**

#### I. **General Training Requirements**

All members of a task force shall meet the following general training requirements prior to deployment:

- Hazardous Materials First Responder Operations, per 29 CFR 1910.120 (q) (6) (ii)
- Respiratory protection training and annual quantitative fit testing per 29 CFR 1910.134
- Duties of the Entrant, per 29 CFR 1910.146 (Per US&R Program Directive 2009-003 or subsequent directive)
- FEMA US&R Enhanced Operations in a Contaminated Environment course
- WMD or Terrorism Awareness for Emergency Responders training (such as AWR 160)

#### II. **Position-Specific Training Requirements**

Task force members shall meet additional position-specific training as required, including the following:

- FEMA US&R WMD Considerations for Hazmat Specialists (developed in 2003) or the new US&R Hazmat Specialists course for all task force Hazmat personnel (under development for delivery in 2014)
- FEMA US&R WMD Considerations for Medical Specialists or the subsequently modified Medical Specialist course that includes the CBRNE training for all US&R Medical personnel

### **3-4. Equipment Maintenance**

All US&R equipment shall be maintained and calibrated according to the manufacturer's recommendations.

### **3-5. Task Force Position Considerations**

Task force personnel must consider the extraordinary circumstances of performing structural collapse search and rescue operations in a contaminated environment. Operational decisions will be strongly influenced by data collected through atmospheric monitoring and continuous site characterization, PPE requirements, compressed work cycles, decontamination requirements, and the threat of secondary devices.

In addition to their regular duties and responsibilities, personnel holding the following positions must also assume position-specific responsibilities and possess additional knowledge, skills, and training.

#### **I. Safety Officer**

- Be knowledgeable regarding operations implemented at the emergency response site, able to recognize and identify hazards, and prepared to provide direction regarding the safety of operations being conducted.
- Assess site safety needs, coordinate with the Hazmat Manager to ensure site and Base of Operations (BoO) safety, and make recommendations to the TFL for implementing a site safety plan.
- If possible, be trained as a Hazmat Technician (recommended, but not required).

#### **II. Medical Team Manager**

- Demonstrate knowledge of the signs, symptoms, and effects of exposure to industrial and military grade agents, toxins, and contaminants.
- Maintain an awareness of hazardous materials exposure-related health issues, including prophylaxis and acute and chronic care and effects of exposure to radiation.
- Remain in contact with the TFL and Safety Officer for situational updates.
- Monitor the health of all task force members and canines.

#### **III. Hazmat Team Manager**

- Meet all requirements of the Hazmat Specialist.
- Interface with the on-scene Incident Support Team (IST) Hazmat Specialist, and Hazmat/environmental agencies at all levels of government.



- Evaluate the impact of current and future weather conditions.
- Provide safety briefings to personnel before commencing operations.
- Ensure that control zones have been established and enforced to protect the site and task force members. This includes establishing the following:
  - Hazard zones
  - Decontamination corridors and methods
  - Operational work areas
  - Refuge areas
- Begin the overall assessment of operational areas to determine the following:
  - Functional requirements and immediate needs
  - Work schedules for extended operations, including rest and rotation periods for personnel
  - Task force stay times of personnel working in a radiation environment (Refer to Appendix E US&R Standard Radiological Response Operating Guidelines.)
  - Adequacy and availability of external agencies to provide support services (e.g., decontamination of water supply, SCBA refill source, decontamination waste water removal, and analytical laboratory resources)
- Ensure that ongoing site hazard and risk assessments are performed.
- Develop the Site Safety Plan (ICS 208HM Site Safety Plan), in coordination with the Safety Officer, other task forces, and Hazmat/environmental agencies at all levels of government, which includes the following:
  - Identifying emergency signaling procedures
  - Planning contingencies for the rescue of task force personnel
  - Establishing escape routes and safety zones
  - Providing input to the Safety Officer to ensure that the health and welfare needs of task force members are addressed
  - Coordinating with the Safety Officer to establish a plan of continuous air monitoring of work sites and the BoO
- Determine the proper level of PPE for initial reconnaissance and subsequent operations.

- Ensure that medical and decontamination functions are operational prior to entry into exclusion zones.
- Assign Hazmat Specialists as needed.
- Document Hazmat group findings, actions, and activities.

#### **IV. Hazmat Specialist**

- Conduct continuous detection and monitoring operations and maintain equipment.
- Assist with recon and site characterization.
- Conduct product research and monitor environmental/weather conditions.
- Deny entry to the contaminated area, if any of the following conditions exist (unless appropriate protective action is taken):
  - Flammable gas, vapor, or mist in excess of 10% of its LEL. Personnel must exercise extreme caution in the presence of any flammable gas reading, as it may increase rapidly. Therefore, the cause of vapors should be investigated and, if possible, eliminated prior to entry.
  - Oxygen levels below 19.5% or above 22%
  - Any toxic material readings within 10% of its IDLH level
  - Obvious or perceptible fumes, odors, smoke, or vapor from a confined space or where vision is obscured within five-foot levels
  - Asbestos hazards

(Refer to the decision algorithms located in Appendix B for further details.)

- Conduct radiation monitoring and establish a control zone at 5 mr/h including administrative entry control (time, distance, and shielding) records. A second control zone will be established at 1000 mr/h (1 rem). All meter readings should be verified with a second meter with different technologies and different operators. The Department of Homeland Security (DHS), per Federal Register Volume 71-Number 1 on January 3, 2006, has set exposure limits as stipulated in “Radiation Response Worker Guidelines” and “Electronic Dosimeter Alarm Set Points” (See Appendix A.)
- Conduct hazardous materials control and/or mitigation operations, if deemed appropriate.
- Supervise or perform decontamination operations.
- Coordinate medical monitoring and patient hand-off with the medical team located at the decontamination site.

- Coordinate the disposal of solid and liquid waste from the decontamination process.

## V. All Task Force Members

- Wear specialized PPE.
- Set-up and/or staff the decontamination corridor.
- Assist Hazmat Specialists as needed.
- Operate within a contaminated SAR environment.

## 3-6. Specialized Plans

### I. The Site Safety Plan

In addition to the necessary components of the Operational Action Plan and Tactical Action Plan, **the Site Safety Plan should encompass all health and safety aspects of conducting SAR operations in or near a contaminated environment.** This goal is typically accomplished by adding the ICS-208HM to the Site Safety Plan. Some of the areas that should be addressed in the Site Safety Plan follow:

- Location and size of control zones and access control points
- Proper level of PPE in each zone
- Development of a decontamination plan to include the following:
  - Decontamination site locations, including access and egress for the decontamination corridor
  - Decontamination methods
  - Proper setup of the decontamination corridor
  - Safe refuge areas
- Establishment of a Rapid Intervention Team (RIT) outfitted with chemical protective clothing
- Medical monitoring of responders operating in chemical protective clothing
- Emergency signaling procedures, escape routes, and safety zones
- Responder accountability
- Establishment of a Responder Medical Treatment Team
- Work cycles and entry time parameters

## II. The Medical Safety Plan

The Medical Safety Plan shall address the following:

- Personnel awareness of the health hazards in the operational environment
- Effects of PPE use
- Symptoms of known or suspected agents and/or hazardous materials
- Issuance and use of antidote kits
- Coordination of medical surveillance program with the IST Medical Officer

## CHAPTER 4: HAZARDOUS EQUIPMENT PUSH PACKAGE (HEPP)

### 4-1. Purpose

The National Urban Search and Rescue (US&R) Response System (the System) has implemented an initiative referred to as the Hazardous Materials Equipment Push Package (HEPP) Program, which is now operational. The primary intent of this initiative is to ensure that the System maintains a fully deployable “all hazards” response capability for the contaminated environment, while reducing the financial burdens on each task force that have occurred due to changing technology and competing needs. Secondary benefits of this initiative include a reduction of the overall cube and weight associated with the current US&R equipment cache and a decrease of the overall cost of a task force Hazardous Materials (Hazmat) equipment cache.

The basic objective of the HEPP is to strategically locate specific Hazmat-related equipment caches throughout the nation. The HEPPs are maintained and deployed by an assigned System task force to support the deployment of US&R resources that may involve a known or potential Hazmat, a Chemical, Biological, Radiological, Nuclear, Explosive (CBRNE), or other related event. Hazmat and Logistics Work Groups continue to work on this initiative with support from the US&R Branch and System members.

The HEPP Program is intended to be activated when one or more task forces are deployed to a suspected or known Hazmat or contaminated environment. **This determination is made by the US&R Branch Chief or his/her designee, and no HEPP Cache will be deployed as a Federal resource without an Activation Order from the US&R Branch.**

Each US&R task force is expected to be able to perform operations in a Hazmat or contaminated environment for up to 12 hours, based on the current US&R equipment cache requirements. Each HEPP contains enough equipment and supplies to extend the operational capability for one task force to perform operations in a contaminated environment for 24 additional hours. Therefore, one HEPP should allow one task force to perform operations in a contaminated environment for a total of 36 hours. Operations after 36 hours will be contingent upon the availability of equipment needed to support mission requirements. The HEPP capability does not reduce the requirement for each task force to be self-sufficient for 72 hours regarding equipment and supplies.

### 4-2. Locations

The following locations have been selected as HEPP host sites:

- Maryland Task Force One (MD-TF1)

- Florida Task Force Two (FL-TF2)
- Indiana Task Force One (IN-TF1)
- Texas Task Force One (TX-TF1)
- Colorado Task Force One (CO-TF1)
- Nevada Task Force One (NV-TF1)
- California Task Force Seven (CA-TF7)

#### **4-3. Funding**

The placement of a HEPP cache with a System Sponsoring Agency is intended to be cost neutral to the Sponsoring Agency. Subject to the availability of funds, the US&R Branch is anticipated to allocate monies each year to the host Sponsoring Agencies to store, exercise, and maintain, a HEPP cache that is ready for deployment through their Readiness Cooperative Agreements.

By October 30<sup>th</sup> of each year (or as otherwise requested by the US&R Branch), the HEPP Sponsoring Agencies shall provide the US&R Branch Program Management Section Chief with an estimate of expected costs to assist with the budgeting for future cooperative agreements. This cost estimate shall be based on actual expenses incurred from the preceding year and any additional costs anticipated for the following year(s), as funding allows. The estimate shall be submitted on the electronic form provided by the US&R Branch.

All appropriate, allowable costs incurred for the alert or activation of HEPP cache(s) shall be reimbursed through a HEPP Sponsoring Agency's Response Cooperative Agreement.

#### **4-4. Storage**

The HEPP caches are delivered to the host Sponsoring Agency in a FEMA-owned 53' foot over-the-road (OTR) trailer that is licensed, tagged, and insured by DHS. The equipment in the trailer is packaged in ROPAK shipping containers in a standardized manner to ensure that the same item will be located in the same ROPAK container across all seven HEPP caches. HEPP Sponsoring Agencies do not have the authority to add, remove, or relocate equipment from one container to another unless authorized by the US&R Branch. When authorized, equipment shall be added or deleted in all seven caches to maintain consistency across the System.

The assigned HEPP OTR trailer may be stored outdoors. However, the equipment packaged in the ROPAK shipping containers and the air trailer must be stored indoors

and not subjected to extreme temperatures. Storing specialized electronic equipment that is sensitive to heat or cold in a climate-controlled room is recommended.

The HEPP caches are color coded and assigned a series of numbers to easily identify which shipping container is assigned to which cache and to which HEPP Sponsoring Agency. Currently, 23 ROPAKS comprise each HEPP. However, this number may fluctuate as changes are made. (e. g., ROPAKS with red labeling and numbers 100-122 would be assigned to MD-TF1; ROPAKS with purple labeling and numbers 600-622 would be assigned to NV-TF1).

The following list identifies the HEPP ROPAK number and color by assigned task force:

<b><u>Number Series</u></b>	<b><u>Label Color</u></b>	<b><u>Host Agency</u></b>
100	Orange	MD-TF1
200	Blue	FL-TF2
300	Green	IN-TF1
400	Yellow	TX-TF1
500	Red	CO-TF1
600	Purple	NV-TF1
700	White	CA-TF7

#### **4-5. Maintenance**

A HEPP Maintenance and Inventory Log shall be maintained for each HEPP equipment cache. At least three primary categories shall be tracked as part of maintaining the HEPP caches—HEPP equipment, the 53' OTR trailer, and the breathing air trailer.

The maintenance log should also include sub-categories, such as the following:

- Date that an item has been inspected and/or inventoried
- Record of maintenance performed (including the changing of batteries, filters, and sensors)
- Condition of equipment and issues revealed during inspections

Any unusual maintenance or equipment replacement issues shall be coordinated with the US&R Branch Logistics Section. The following paragraphs identify specific requirements for maintaining the HEPP cache.

## **I. HEPP Equipment**

The HEPP cache equipment shall be maintained according to the manufacturer's recommendations. At a minimum, equipment shall be removed from storage containers, inspected, set up, and tested once a year. Monitors, radiological devices, and other devices requiring calibration and maintenance shall be maintained at full readiness per manufacturer's specifications. Battery operated equipment shall be charged monthly or kept on charge as recommended by the manufacturer. Batteries that may leak shall be removed from any devices when not in use and should be stored in plastic bags with the device.

## **II. 53' OTR Trailer**

The FEMA-owned OTR trailer shall be exercised and maintained according to state and local guidelines. The driver shall inspect the trailer, as required, prior to any movement. Tires and brakes shall be checked according to accepted transportation practices, and the check shall be recorded in the maintenance log. HEPP equipment shall not be preloaded on the trailer unless the trailer is stored inside a task force warehouse.

## **III. Breathing Air Trailer**

The Scott Liberty II breathing air trailer and air compressor shall be inspected and maintained according to the manufacturer's recommendation and Federal, state and local regulations. Air quality must be certified according to Federal, state and local regulations on a quarterly basis at a minimum and results recorded in the maintenance log. The HEPP cache air trailer is Federal equipment that will need exercise on a regular basis. The breathing air trailer shall be road exercised at least quarterly and documented in the maintenance log to include the length of travel and time exercised. Additionally, road tire pressures shall be checked on a monthly basis and recorded in the maintenance log. Details concerning the red-colored Scott Liberty II air trailer are as follows:

- Fully-enclosed tandem-axle air trailer, suited for mobile applications
- Equipped with four ASME storage cylinders, a 20 horsepower air compressor (25.5 cfm) / (722 lpm), 6,000 psi/413 bar
- Capable of being towed by any vehicle rated for 7,000 lbs. or more
- Includes a 7.2 kw auxiliary generator, cold weather package, surge brakes, high and low pressure reels, and the Scott Smart Fill Auto Cascade Systems
- Weighs 6,200 lbs.
- Measures 193" x 75" x 91"
- Considered Federal property
- Licensed, tagged, and insured by DHS



The HEPP Maintenance and Inventory Log shall be submitted to the US&R Branch by June 1st of each year. The log shall be submitted electronically to the US&R Branch Property Management Officer at the US&R Warehouse in a PDF format with a summary cover memorandum detailing any issues regarding the assigned HEPP cache. The Property Management Officer shall report any deficiencies to the US&R Operations Section Chief. This information can be submitted with the equipment database CD, which is required of all task forces annually. The deadline for this requirement is also June 1<sup>st</sup>, as outlined in the current US&R Readiness Cooperative Agreement Statement of Work.

#### **4-6. Inventory**

The HEPP equipment is considered Federal property and will be maintained according to 44 CFR 13.32—Federal property and accountability standards. High value and accountable property is barcoded with a FEMA barcode and recorded on the inventory sheet.

The HEPP cache shall be inventoried at least annually, and a report shall be submitted to the Property Management Officer at the US&R Warehouse no later than June 1<sup>st</sup> of each year. The report should include any need for repair or replacement of equipment, and the completion of the inventory shall be noted in the HEPP Maintenance and Inventory Log.

The HEPP Sponsoring Agencies will safeguard the HEPP equipment in accordance with 44 CFR 13.32(d) (3) and take all reasonable actions necessary to protect the HEPP equipment and prevent loss, damage, destruction, or theft. Lost, damaged, or stolen equipment shall be reported immediately to the US&R Branch Property Management Officer and copied to the US&R Branch Operations Section Chief on the appropriate FEMA forms. In the case of stolen equipment, a police report shall be filed. The HEPP Sponsoring Agency shall then provide an incident report to the US&R Branch Property Management Officer. As previously noted, any discrepancies shall be documented in the HEPP Maintenance and Inventory Log and then reported to the US&R Branch Property Management Officer.

#### **4-7. Transportation**

The HEPP cache OTR trailer shall be moved using either a HEPP Sponsoring Agency owned, or rental contracted, prime mover tractor. The HEPP cache breathing air trailer shall be moved using a HEPP Sponsoring Agency owned, or rental contracted, prime mover. If a HEPP Sponsoring Agency expects to deploy a task force while simultaneously deploying a HEPP cache, the HEPP Sponsoring Agency may be required to place a rental vehicle on standby or under contract in order to provide a prime mover for either the HEPP cache trailer or a task force trailer. If a task force and a HEPP cache are simultaneously deployed, and the HEPP Sponsoring Agency does not have spare prime movers and is not able to rent vehicles, the HEPP Sponsoring Agency shall coordinate

with the US&R Branch to have the trailer picked up by contract carrier and delivered. Based on operational requirements, the US&R Branch, in coordination with the HEPP Sponsoring Agency, will determine the best transportation method for timely deployment of a HEPP cache.

#### **4-8. Readiness**

A HEPP Sponsoring Agency shall ensure that the assigned HEPP cache is ready for immediate deployment at all times. A plan shall be in place to staff the driver positions and to provide a prime mover tractor and/or tow vehicle so that the HEPP cache can be on the road within four hours of notification. A HEPP Sponsoring Agency is expected to accept all System Activation Orders. If a HEPP Sponsoring Agency cannot accept an Activation Order, the agency shall immediately notify the US&R Branch of the situation, and the US&R Branch and HEPP Sponsoring Agency will develop an alternative method to deploy the HEPP cache.

The HEPP Sponsoring Agency will develop and maintain the appropriate HEPP cache movement documentation, which will include ground and air load plans, weight and cube size, and Hazmat declaration information for air transport. Copies of these documents will accompany the HEPP cache on any deployment.

If a HEPP Sponsoring Agency cannot maintain full readiness of a HEPP cache, the US&R Branch may take the following action(s):

- Temporarily reassign the HEPP cache to another task force
- Permanently reassign the HEPP cache to another task force
- Arrange to move the HEPP cache to a FEMA Regional Logistics Center or the FEMA US&R warehouse in Herndon, Virginia

If a HEPP Sponsoring Agency is temporarily unable to meet the requirements to readily deploy a HEPP cache, the Task Force Representative shall immediately notify the US&R Branch Operations Section Chief.

#### **4-9. Alert Order**

An Alert Order may be issued to allow a HEPP Sponsoring Agency to prepare a HEPP cache for deployment. If issued, the Alert Order will be funded at \$3,000 to cover allowable personnel and prime mover rental costs. Before incurring any costs that exceed the preauthorized \$3,000 amount, additional funding must be approved by the US&R Branch in writing.

#### **4-10. Activation Order**

The HEPP Sponsoring Agency's authorization to deploy a HEPP cache shall be done through an Activation Order prepared and issued by the US&R Branch using standard

System activation notification practices. A HEPP cache may be authorized to deploy by a verbal order from the US&R Branch Chief or designee, followed by an immediate email authorization. A formal, written Activation Order from the US&R Branch should follow the verbal and email authorizations as soon as possible.

**Note: HEPP caches SHALL NOT be deployed as a National US&R Response System resource without an Activation Order from the US&R Branch. HEPP Sponsoring Agencies SHALL NOT self-deploy and/or move a HEPP cache without appropriate authorization. Failure to follow this standard may cause the HEPP Sponsoring Agency to absorb any costs associated with an unauthorized HEPP cache deployment.**

#### **4-11. Staffing**

Each HEPP cache vehicle deployed by ground transportation shall be staffed by two task force logistics personnel or other task force members qualified to drive commercially-rated vehicles. All personnel responsible for the delivery of a HEPP cache shall hold the proper level of licensure with proper certifications and documentation. The lead individual assigned to manage the cache shall hold the title of HEPP Cache Manager. Ideally, the two drivers assigned to an air trailer tow vehicle will be properly trained in the use of the air trailer itself. However, due to the operational requirements specified in the HEPP Activation Order (e.g., deployment of either the 53' OTR trailer or the air trailer individually) or personnel availability, the number of personnel delivering a HEPP cache, and their level of training in its use, may vary. At a minimum, the personnel requirements when deploying a HEPP cache are as follows:

- Two qualified drivers should always be deployed with each HEPP cache vehicle to facilitate safe movement and meet the potential for 24-hour operations.
- The drivers assigned to the HEPP cache will remain with the cache until it is demobilized and returned to the HEPP Sponsoring Agency.
- The drivers assigned to the HEPP cache are responsible for maintaining inventory control of the cache.
- HEPP-assigned personnel shall accompany HEPP caches being moved by air, when possible.

#### **4-12. Assignment**

The US&R Branch will initially assign HEPP cache(s) and/or air trailer(s) to an operational IST. Once a HEPP cache or air trailer has transitioned to an IST, the IST may

further assign a HEPP cache to a task force. Upon arrival of a HEPP cache, the IST Logistics Section Chief or a specific Task Force Logistics Manager, when directly assigned, will receive, control, and maintain the inventory of the cache until released by the IST, and the HEPP is returned to its home location. This individual will also manage HEPP personnel during this time period.

#### **4-13. Operations**

##### **I. HEPP Cache Operational Policies or Procedures**

- The US&R Branch may deploy one or more HEPP caches during a response that involves environments known or suspected to be Hazmat/CBRNE contaminated.
- The US&R Branch shall make the final determination regarding which and how many caches shall be deployed. HEPP caches shall generally be deployed in order from those that are geographically closest to the incident to those that are geographically farthest, based on the US&R Event Run Order developed for that response.
- The US&R Branch, in coordination with the HEPP Sponsoring Agency, will determine the best method by which a HEPP cache shall be delivered.
- The US&R Branch may deploy a HEPP cache with or without air trailer support, based on incident requirements.
- The US&R Branch may deploy an air trailer, with or without the HEPP cache, based on incident requirements.
- Response requirements will dictate the number of air trailers deployed. The deployment of more than two air trailers to a single location is not anticipated. However, multiple trailers can be deployed to multiple sites.
- Supplies and equipment in the HEPP cache that are not considered high value, **and are not barcoded**, shall be considered expendable equipment. Expendable equipment or supplies that are issued and used during operations, are not expected to be returned to the HEPP cache. Expendable items consumed during a response shall be replaced according to FEMA policy.

## II. Readiness

At all times, the HEPP cache shall be deployable within four hours, by ground or air (with exceptions noted in sections 4-18, “Training & Exercise”, and 4-19, “Local Use”, of this manual).

### A. Deployment by ground

When deployed by ground, the HEPP Sponsoring Agency Activation Order will specify the following:

- That the HEPP cache and/or air trailer will be transported by ground
- The reporting location
- The no-later-than arrival time
- A point of contact

The guidelines listed below shall also be followed:

- When deployed, a HEPP cache(s) will generally be assigned to a specific IST.
- A HEPP cache may be directly assigned to a task force at the direction of the US&R Branch or the assigned IST Logistics Chief through a request to the IST Operations Chief.
- While the cache is in transit, the HEPP Cache Manager shall maintain communication with the National Response Coordination Center (NRCC) Emergency Support Function (ESF) #9 (Search and Rescue) desk and report in every two hours.
- The HEPP Cache Manager shall report to the assigned IST Logistics Chief upon arrival at the assignment; or if assigned to a task force, he/she will report to the task force’s Logistics Team Manager.
- The IST Logistics Chief or Task Force Logistics Team Manager will report the HEPP cache arrival to the IST Operations Chief via the chain of command.
- If a HEPP cache is directed to a staging area, the HEPP Cache Manager and HEPP cache will remain under the supervision of the US&R Branch.

### B. Deployment by air

On the direction of the US&R Branch, a HEPP cache may be deployed by air. When deployed by air, the HEPP Sponsoring Agency Activation Order will specify the following:

- That the HEPP cache and/or air trailer will be transported by air
- The Aerial Port of Embarkation

- The no-later-than arrival time
- A point of contact

The guidelines below shall also be followed:

- When possible, HEPP personnel shall accompany the HEPP cache and/or air trailer being transported by air.
- When not traveling with the cache, assigned HEPP cache personnel will return to their home location after the HEPP cache is received by the cargo facility.
- The US&R Branch shall direct the IST Logistics Chief and/or Task Force Logistics Manager as to where and when the cache will be delivered. Either the assigned receiving IST or the task force will be responsible for recovering, transporting, tracking, and maintaining control of the HEPP cache until it is demobilized.
- Additional HEPP Sponsoring Agency personnel may be required to assist with pallet build up and aircraft loading.

#### **4-14. Demobilization**

A HEPP cache and/or air trailer shall be demobilized according to the same procedures used to demobilize task forces and IST personnel. HEPP personnel will check out from an assignment or incident through their assigned IST or task force as follows:

- If assigned to a task force, prior to demobilizing, the HEPP Cache Manager shall provide the IST Logistics Chief, via the Task Force Logistics Team Manager, a complete list of all equipment and supplies used and/or consumed during the deployment on the appropriate FEMA form.
- If assigned to an IST, prior to demobilizing, the HEPP Cache Manager shall provide the IST Logistics Chief a complete list of all equipment and supplies used and/or consumed during the deployment.
  - The IST shall order replacement equipment and supplies that were consumed and have replacements delivered directly to the HEPP Sponsoring Agency.
  - If the IST is unable to place the order, the US&R Branch Property Management Officer and/or the HEPP Sponsoring Agency will be responsible for coordinating the re-supply.
- A HEPP Cache Manager shall receive a written Demobilization Order to return the cache back to its home location.

- HEPP Cache Managers shall maintain contact with NRCC ESF #9 desk every two hours while in transit to their home location and report their arrival to their Program Manager and to the NRCC ESF #9 desk.

#### **4-15. Return to Readiness**

When a HEPP cache is demobilized and returned to the HEPP Sponsoring Agency, the cache should be returned to service as quickly as possible. The HEPP Sponsoring Agency shall coordinate with the US&R Branch Logistics Manager to determine which procedures are necessary to return the cache to its operational status.

#### **4-16. Reimbursement**

Reimbursement of allowable expenses for personnel and equipment, as well as other miscellaneous approved costs, shall be managed in accordance with the HEPP Sponsoring Agency's Response Cooperative Agreement and the current US&R Branch reimbursement policy. Equipment for resupply of the HEPP cache shall be coordinated through the assigned IST or the US&R Branch Logistics Manager.

#### **4-17. Reporting**

The HEPP Sponsoring Agency must submit the four following reports to the US&R Branch:

- Annual HEPP Cost Estimate – due by October 30<sup>th</sup> of each year
- Annual Maintenance and Inventory Log – due by June 1<sup>st</sup> of each year, submitted electronically to the US&R Branch Operations Section Chief
- Lost, damaged, or stolen equipment reports – required to be reported immediately to the US&R Branch Operations Section Chief
- After-Action Report – due no later than thirty (30) days after an exercise or deployment, to be submitted electronically to the US&R Operations Section Chief

These reporting requirements do not preclude a HEPP Sponsoring Agency from reporting any deficiencies or relevant issues regarding a HEPP cache when they occur. Any normal day-to-day communications concerning HEPP caches should be directed to the US&R Branch Logistics Manager or US&R Branch Hazmat Program Manager.

#### **4-18. Training and Exercise**

The HEPP cache and/or air trailer (or components thereof) may be used for US&R training by a HEPP Sponsoring Agency or other System Sponsoring Agency. Any related personnel costs or those associated with shipping, use, equipment, and consumables of a HEPP cache and/or air trailer shall be the sole responsibility of the System Sponsoring Agency requesting the use of a HEPP cache and/or air trailer. A request to use a HEPP

cache and/or air trailer for an exercise shall be submitted to the US&R Operations Section Chief by email at least 45 days prior to the exercise start date, so that it can be approved at least 30 days prior to the exercise.

**Note: No items shall be consumed from the HEPP cache during an exercise that will place the HEPP cache out of service for National US&R Response System activation for a period of more than 24 hours.**

#### **4-19. Local Use**

A HEPP Sponsoring Agency, or other System Sponsoring Agency in close proximity, may use the HEPP breathing air trailer during local emergencies or as a backup to a local air program in the event the Agency's primary method of air refill capability is temporarily out of service. Any costs associated with the use by an Agency's local air program shall be the responsibility of the System Sponsoring Agency using the HEPP breathing air trailer. The protocols described below must be followed:

- **Local EMERGENCY use of a HEPP cache breathing air trailer by a System Sponsoring Agency shall be reported to the US&R Branch Operations Section Chief as soon as possible and shall not place the unit out of service for National US&R Response System activation for a period of more than 24 hours.**
- **Local NON-EMERGENCY use of a HEPP cache breathing air trailer by a System Sponsoring Agency shall be approved in advance by the US&R Branch Operations Section Chief and shall not place the unit out of service for National US&R Response System activation.**



## Appendix A – Response Worker Guidelines

TABLE 1B.—RESPONSE WORKER GUIDELINES

Total effective dose equivalent (TEDE) guideline	Activity	Condition
5 rems .....	All occupational exposures .....	All reasonably achievable actions have been taken to minimize dose.
10 rems* .....	Protecting valuable property necessary for public welfare (e.g., a power plant).	Exceeding 5 rems unavoidable and all appropriate actions taken to reduce dose. Monitoring available to project or measure dose.
25 rems** .....	Lifesaving or protection of large populations .....	Exceeding 5 rems unavoidable and all appropriate actions taken to reduce dose. Monitoring available to project or measure dose.

\* For potential doses >10 rems, special medical monitoring programs should be employed, and exposure should be tracked in terms of the unit of absorbed dose (rad) rather than TEDE (rem).

\*\* In the case of a very large incident such as an IND, incident commanders may need to consider raising the property and lifesaving response worker guidelines in order to prevent further loss of life and massive spread of destruction.

Electronic Dosimeter Alarm Point Guidance			
Alarm Set Point Type	Reading <sup>3</sup>	Comments <sup>1,2</sup>	Responder Actions
1 <sup>st</sup> Dose Rate	5 mrem/hr	This is a generally accepted value to be used to establish the hot zone (exclusion area) for a response to a transportation accident involving radiation. 10 CFR 20.1003 defines 5 mrem/hr as a radiation area.	Continue rescue and investigation activities.  Establish exclusion zone.
2 <sup>nd</sup> Dose Rate	1000 mrem/hr		Leave the area unless rescue of known victims can be accomplished efficiently and within guidance values for accumulated dose alarms to responders.
1 <sup>st</sup> Accumulated Dose	2500 mrem (2.5 rem)	This is one-half of the 5,000 mrem annual regulatory exposure limit for occupationally exposed radiation workers. Overall intention is to stay below the EPA 5 rem per year. If personnel receive 2.5 "going in" they may likely receive additional 2.5 during exit the radiation	Accumulated doses greater than 10 rem must be carefully considered.
2 <sup>nd</sup> Accumulated Dose	10000 mrem (10 rem)	This is less than one-half the 25,000 mrem dose value listed in EPA 400-R-92-001 for lifesaving or protection of large populations. Recommended value listed in National Council on Radiation Protection and Measurements Report Number 138.	Seek expert advice.

1. REM refers to all exposure pathways. If proper respiratory protection is being used, the internal pathways contributions to dose are minimal.
2. Basis of the value used is taken from the document indicated.
3. At the listed values, no immediate health effects from the radiation exposure would be observed in the responder.

**Task Forces shall calibrate their electronic radiation detection equipment to reflect the alarm set points identified in the above alarm point guidance.**

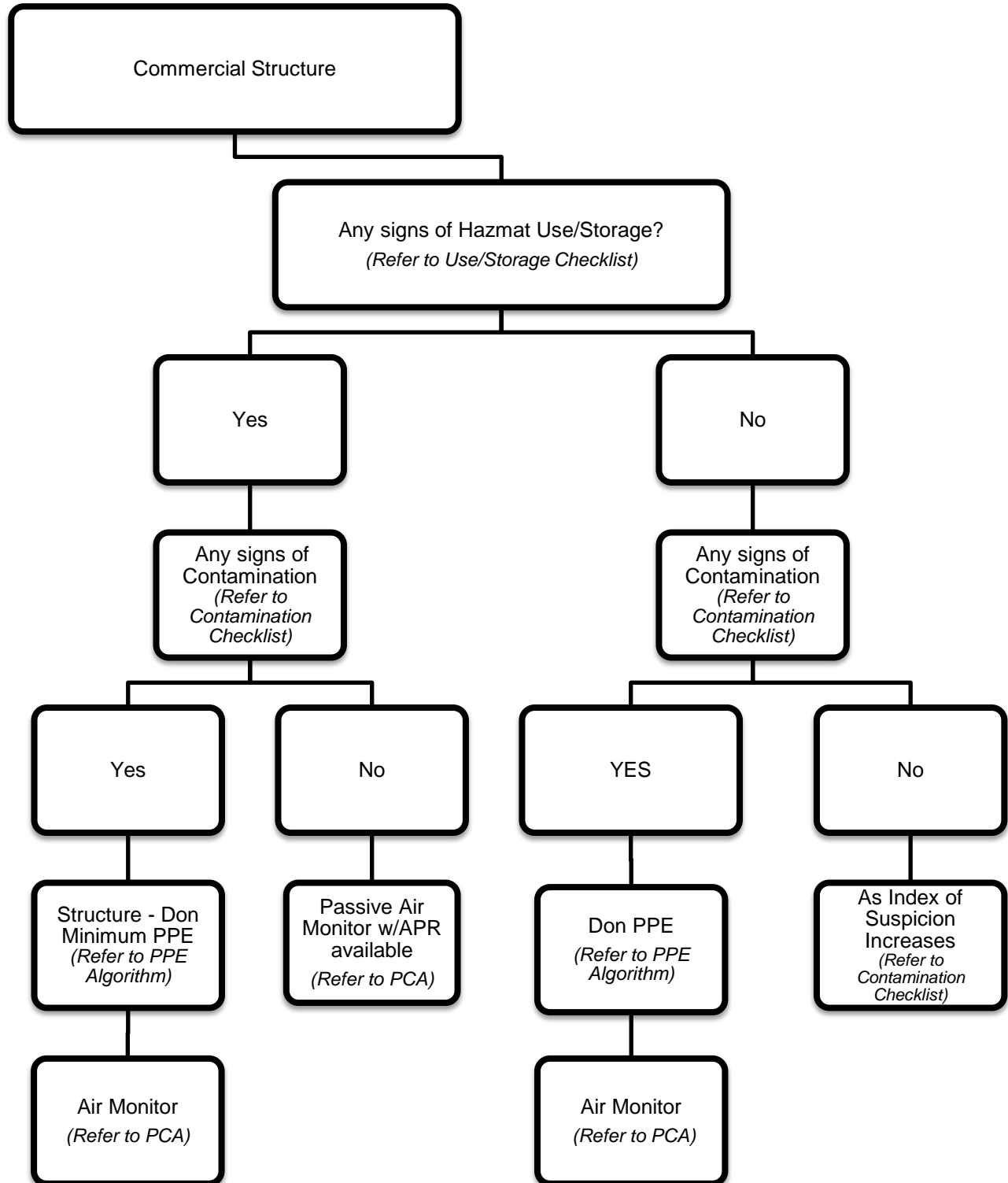


## Appendix B - US&R Hazmat Site Characterization Decision Algorithms

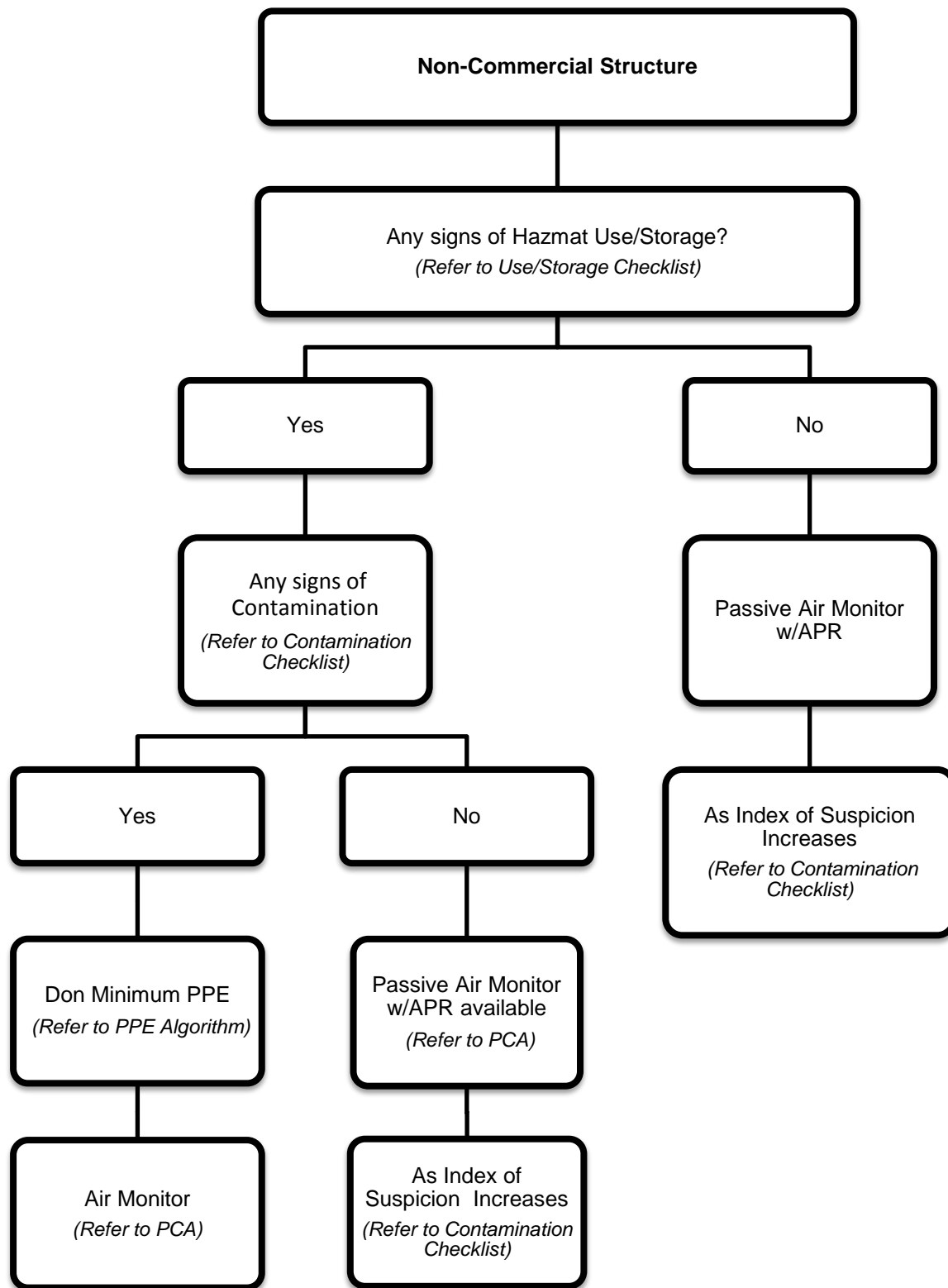
### OPERATIONAL ASSUMPTIONS

- Task force members are expected to have completed system-required training and have met all requirements of their assigned position.
- Data collected in the field using task force detection methods are used to support the assumption that search and rescue sites are highly likely to be contaminated.
- Any time air monitoring is actively being performed, the minimum respiratory protection used will be an Air Purifying Respirator (APR).
- When faced with questionable or inconclusive data, a defensive posture should be established.
- Personnel are expected to use common sense to avoid exposure.
- Task force monitoring capabilities are NOT all-inclusive and do not replace the use of good judgment.
- A search and rescue site may be contaminated beyond the capabilities of personal protective equipment used by the FEMA National Urban Search and Rescue System.
- “Active monitoring” is the term used when task force detection equipment is used to characterize or quantify chemical hazards in a contaminated environment.
- “Passive monitoring” is the term used when task force detection equipment is used to warn of the possibility of an Immediate Danger to Life and Health (IDLH) environment.

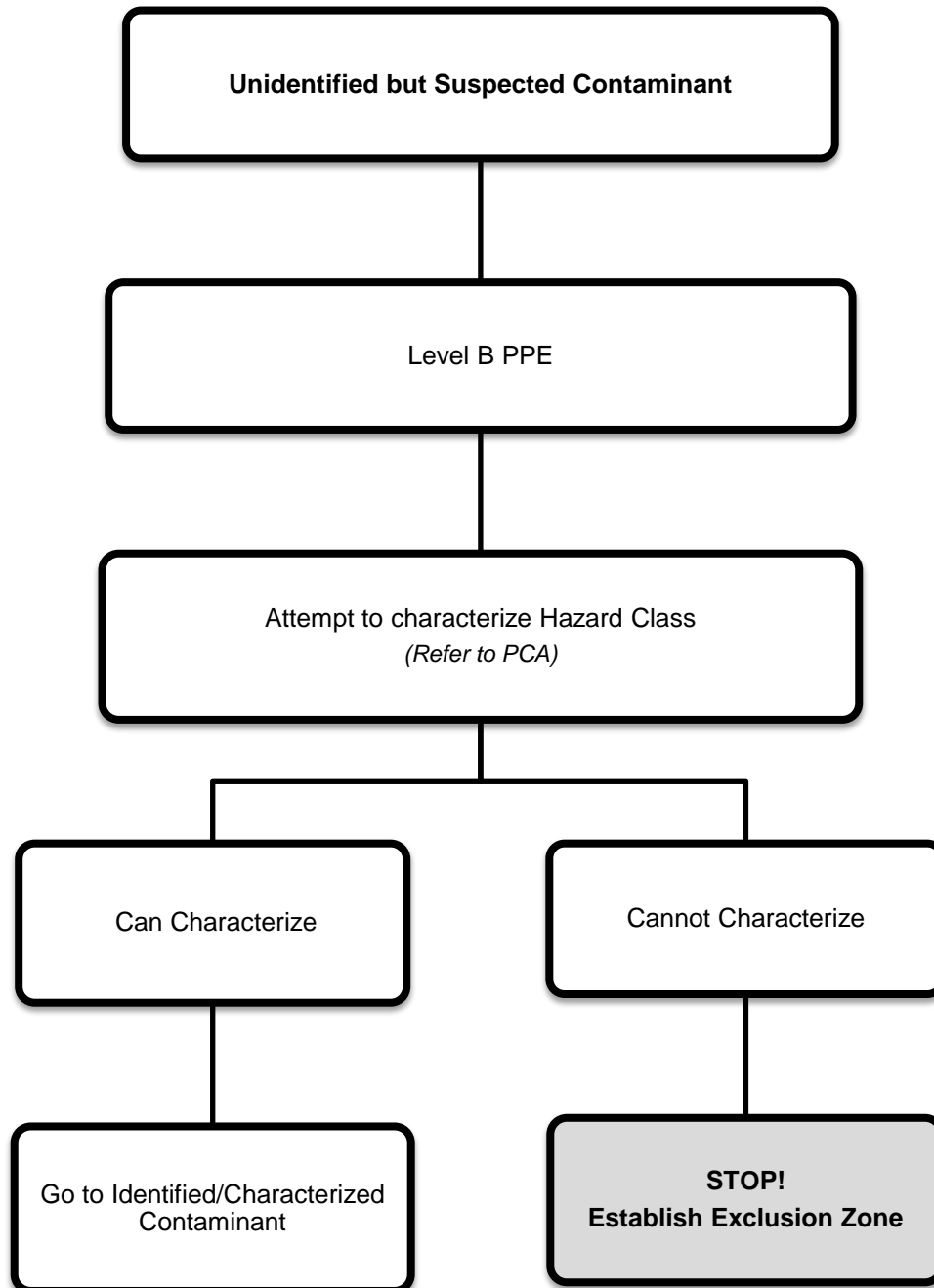
## Commercial Structure Evaluation with No Known Contaminant



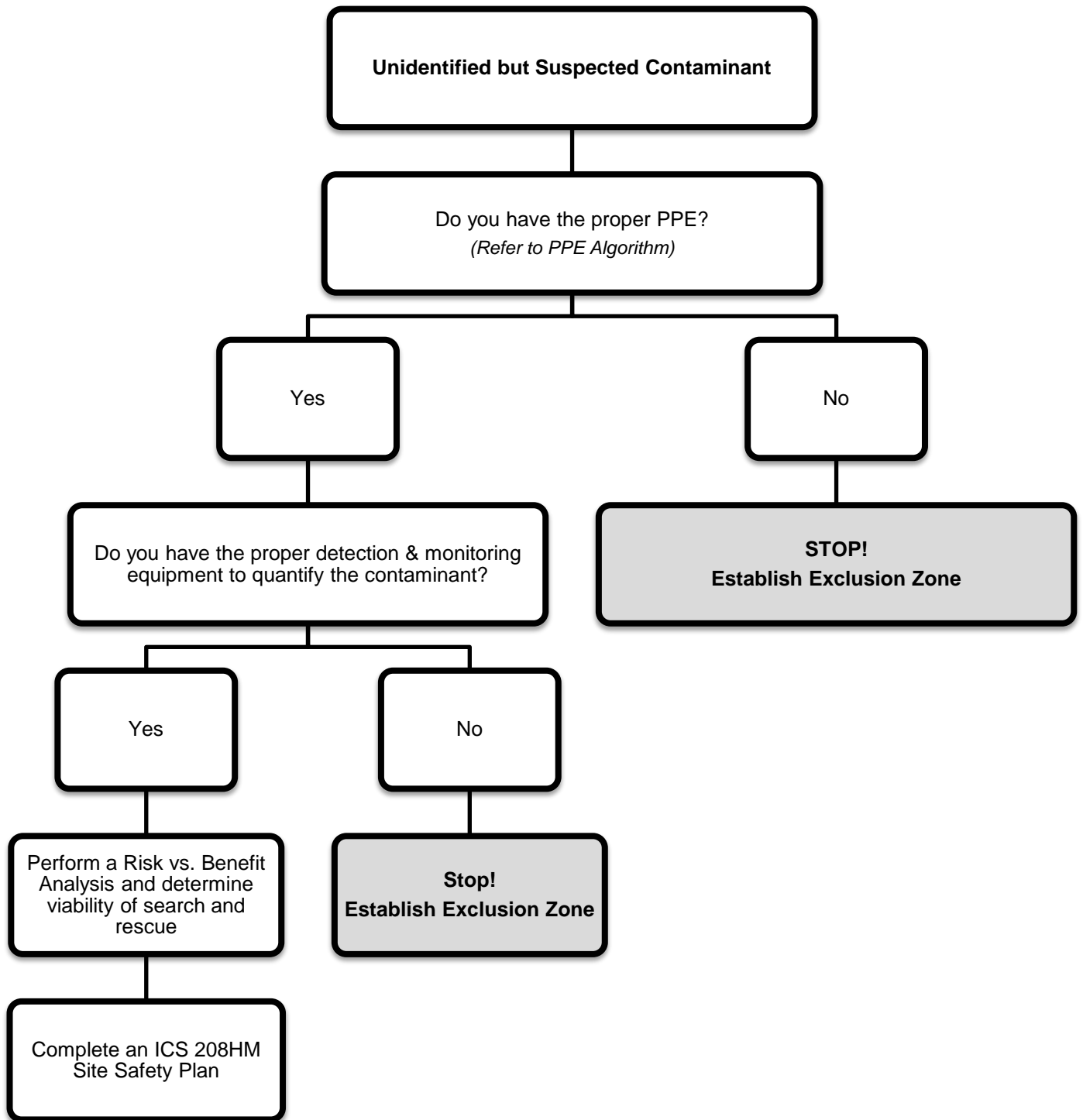
## Non - Commercial Structure Evaluation with No Known Contaminant



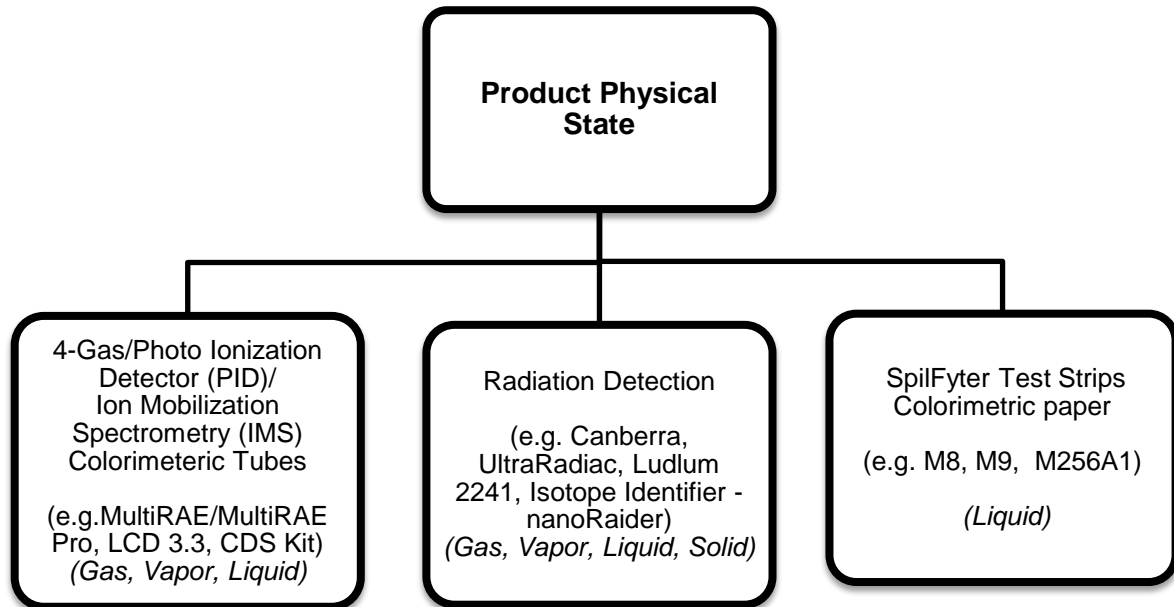
## Structure Evaluation with Unidentified but Suspected Contaminant



## Structure Evaluation with Unidentified but Suspected Contaminant

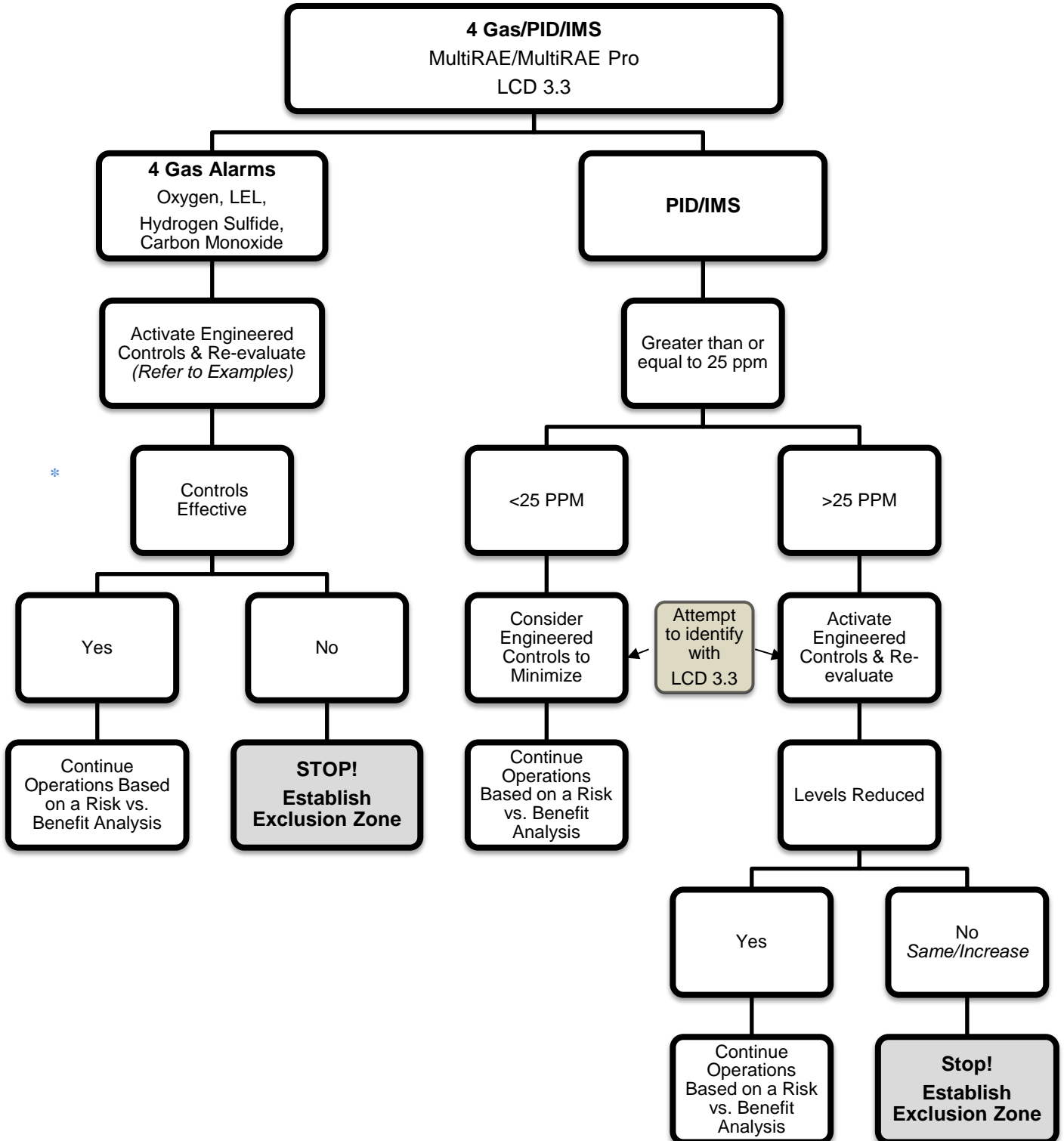


## Product Characteristic Algorithm (PCA)

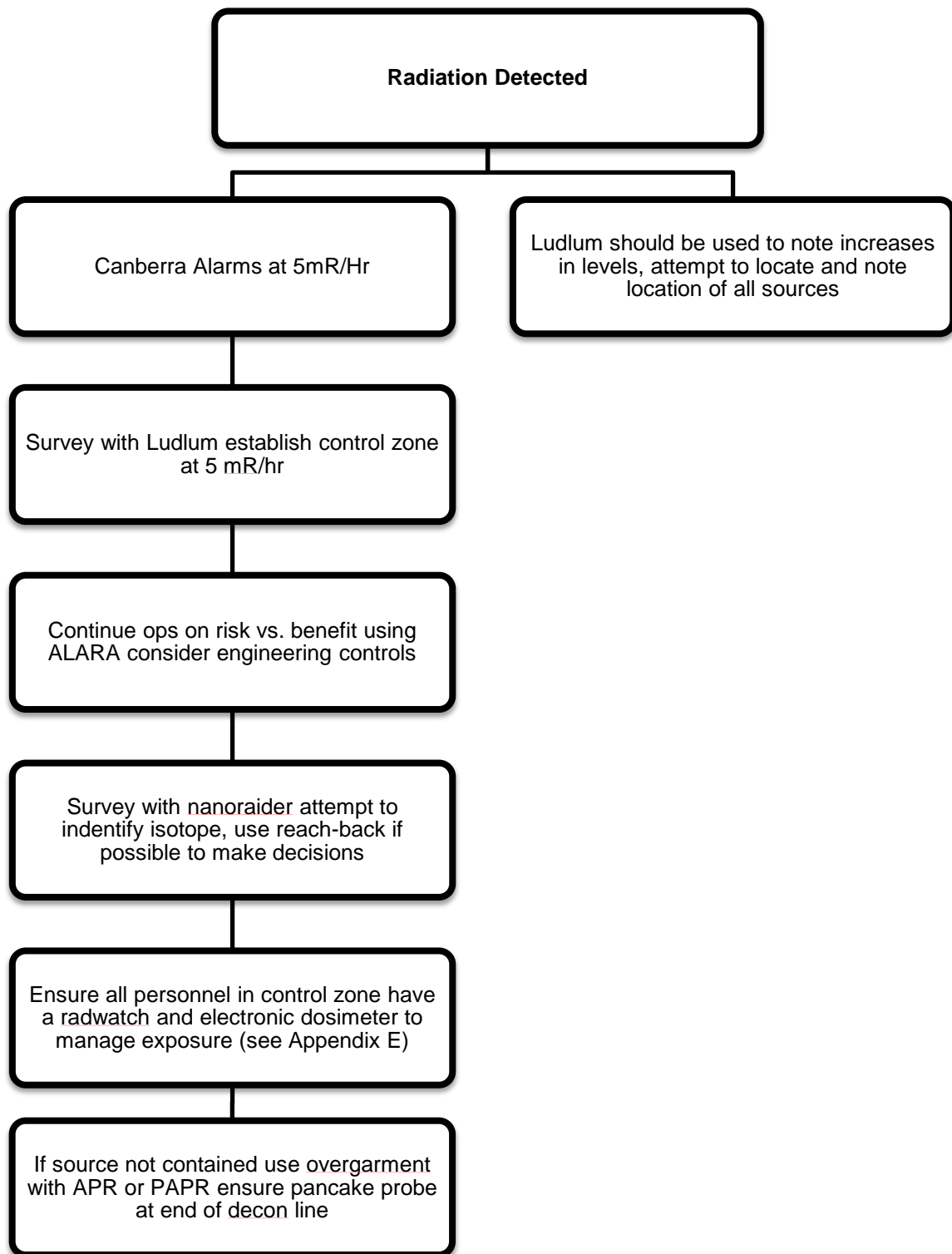




## PCA 4 GAS/ Photo Ionization Detector (PID)/ Ion Mobilization Spectrometry (IMS)

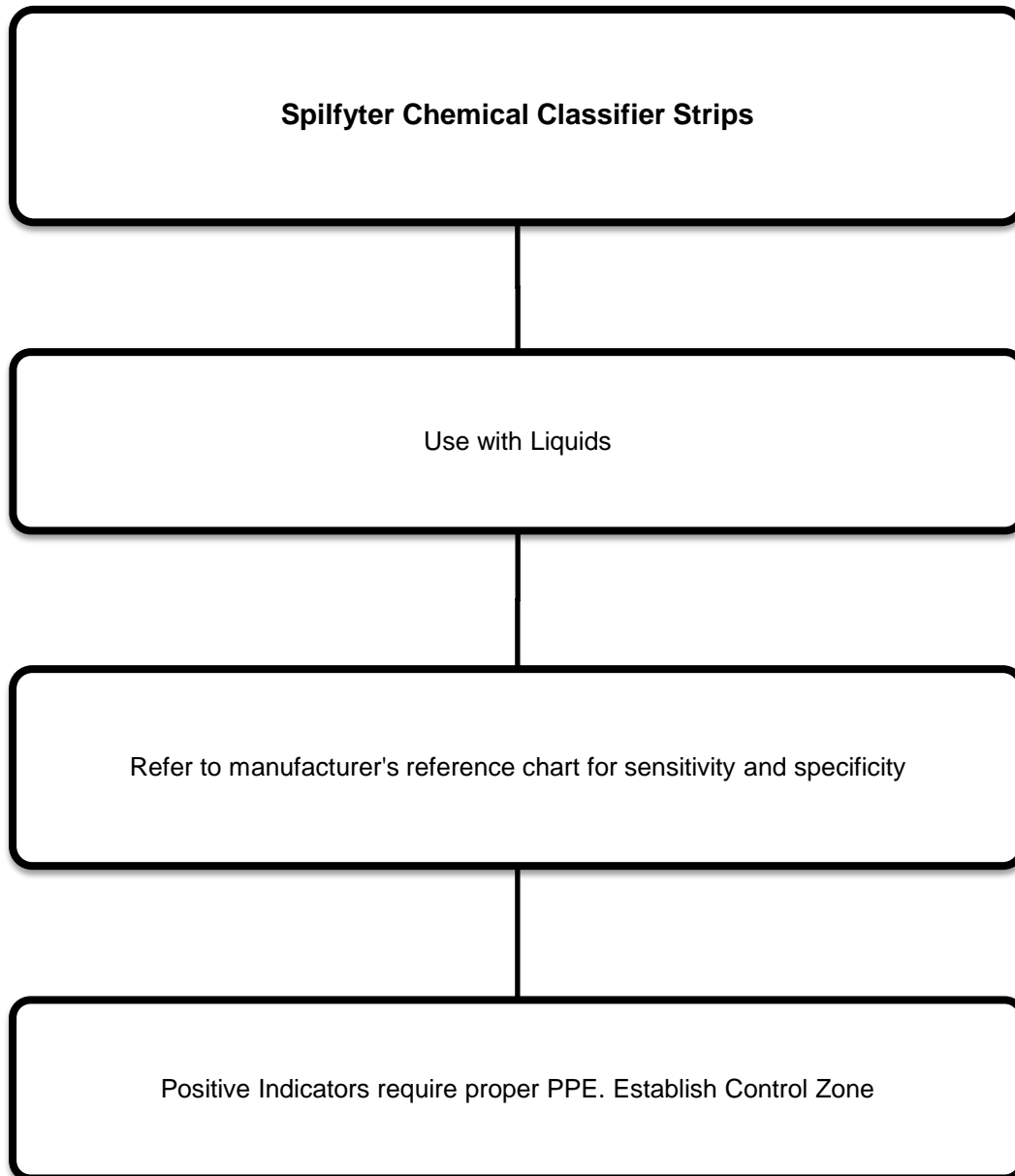


## PCA Radiation Detection

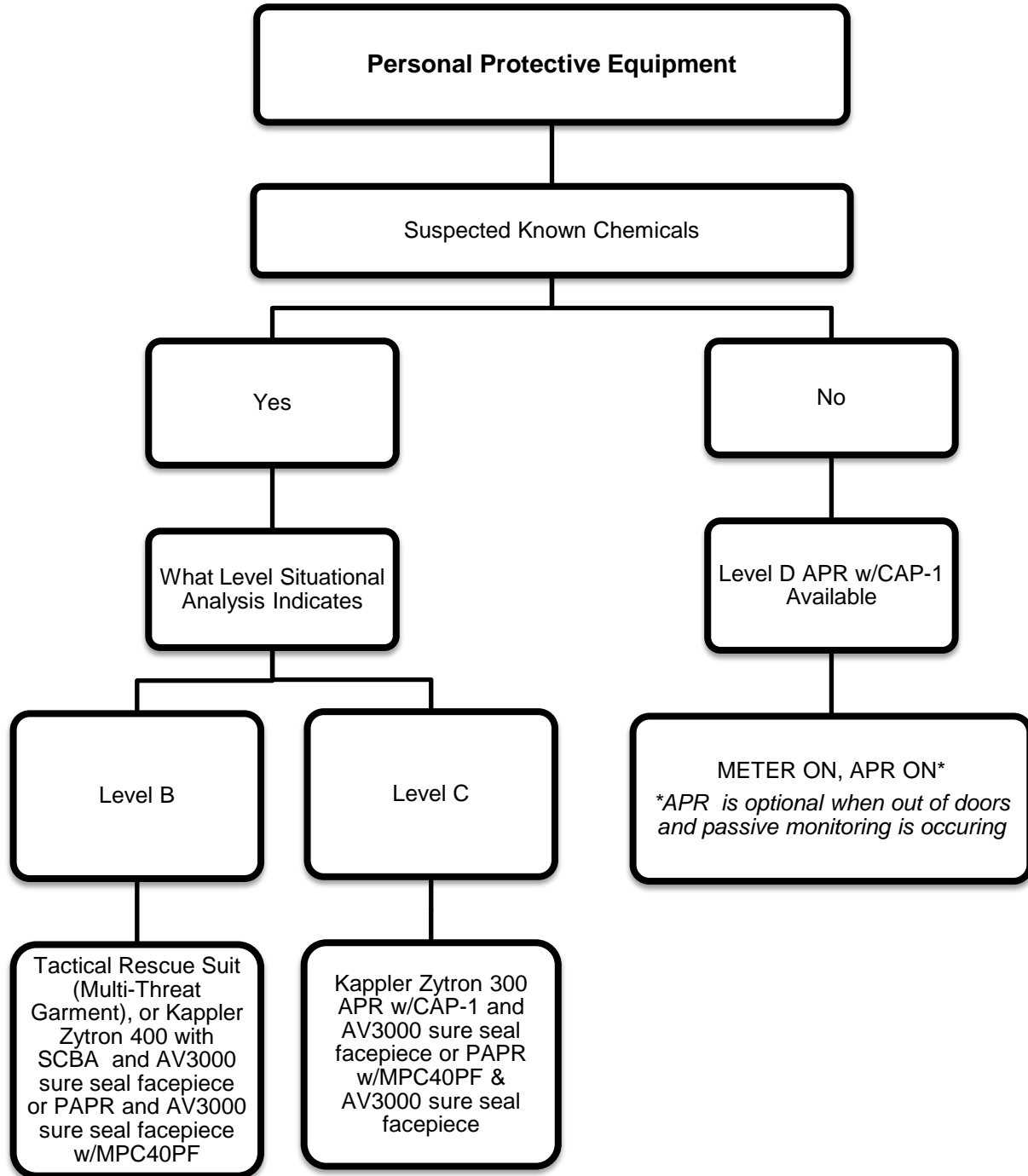


\*ALARA: "As Low As Reasonably Achievable"

## Product Characteristic Algorithm (PCA) Chemical Classifier Strips



## Personal Protective Equipment (PPE) ALGORITHM



### Use/Storage Example Checklist

<b>Occupancy</b>	<b>Rail Cars</b>
Business indicative to known Hazmat use	Pressurized
Cold Storage	Corrosive
Refinery	
Hospital	<b>Highway Tankers</b>
University (lab)	Pressurized
Water Treatment	Corrosive
Agricultural chemicals	
Research Facility	
<b>Signage</b>	<b>Bulk Storage/Fixed Facility</b>
NFPA 704	Pressurized
Pipeline markings	Non-pressurized
Placards	Cryogenic
Labels	Silos
	Palletized
<b>Pressurized Cylinders</b>	<b>Intermodal</b>
100/150 lb. cylinders	
1 ton cylinders	<b>55-Gallon Drums</b>

## Contamination Checklist

<b>Liquids</b>	<b>Gases</b>	<b>Solids</b>
Sheen/Rainbowing	Any signs of burning	Powders
Signs of death	Signs of death	Dust
Floating debris	Discoloration	
Discoloration	Staining	
Staining	Vapor clouds	
Scum	Auto-refrigeration	
Sludge	Sounds (hissing, roaring, etc.)	
Signage	Dead Vegetation	
Dead Vegetation		

## Engineering Control

TURN OFF VALVE
COVER THE PRODUCT
Puddles
Liquids
Radioactive Material
REMOVE THE PRODUCT
LOCK-OUT/TAG-OUT
SWEEP IT
PROVIDE VENTILATION
Windows
Fans
REDUCE CONTAMINANT





## Appendix C - Chemical Protective Clothing (CPC)

- (1) Hazards exist when working in any level of CPC and include the following:
  - Physiological (heat stress)
  - Reduced mobility
  - Reduced hearing
  - Limited vision (poor peripheral vision)
  - Reduced dexterity
  - The CPC may promote claustrophobia
- (2) Personnel can only wear the CPC that they have been trained and qualified to use.
- (3) Damage can occur to the CPC through the following:
  - Mechanical failure – cuts, tears, and punctures
  - Thermal failure – most do not offer fire protection
  - Chemical failure – no one suit will protect against all chemicals
  - Permeation, penetration, and degradation when exposed to chemicals. Factors affecting the extent of permeation are:
    - Contact time,
    - Concentration of the agent,
    - Temperature,
    - Size of contaminant molecules and pore space, and
    - Physical states and characteristics of the agents.
- (4) CPC is divided into four categories, based on the degree of protection afforded, as follows:
  - Level A – To be selected when the greatest level of skin, respiratory, and eye protection is required. The following constitute Level A equipment:
    - Positive pressure full face-piece SCBA, or positive pressure supplied air respirator with escape SCBA, approved by the National Institute for Occupational Safety and Health (NIOSH)
    - Totally-encapsulating gas-tight chemical-protective suit

- Coveralls or Battle Dress Uniform (BDU)
- Gloves, outer, chemical-resistant
- Gloves, inner, chemical-resistant
- Boots, chemical-resistant, steel toe and shank
- Hard hat/US&R helmet (under suit)
- Disposable protective suit, gloves, and boots (depending on suit construction, may be worn over totally-encapsulating suit)
- Level A protection should be used when:
  - The hazardous substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either the measured (or potential for) high concentration of atmospheric vapors, gases, or particulate matter; or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulate matter that is harmful to skin, or capable of being absorbed through the skin,
  - Substances with a high degree of hazard to the skin are known or suspected to be present and skin contact is possible, and/or
  - Operations must be conducted in confined, poorly ventilated areas, and the absence of conditions requiring Level A has not yet been determined.
- Level B – The highest level of respiratory protection is necessary but a lesser level of skin protection is needed. The following constitute Level B equipment:
  - Positive pressure, full face-piece SCBA, or positive pressure supplied air respirator with escape SCBA (NIOSH approved)
  - Hooded, chemical-resistant clothing (overalls and long-sleeved jacket, coveralls, one or two-piece chemical-splash suit, disposable chemical-resistant overalls, or non-gas-tight encapsulated suit)
  - Coveralls or BDUs
  - Gloves, outer, chemical-resistant
  - Gloves, inner, chemical-resistant
  - Boots, outer, chemical-resistant steel toe and shank

- Boot covers, outer, chemical-resistant (disposable)
- Hard hat/US&R helmet
- Face shield
- Level B – Level B protection should be used when:
  - The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection,
  - The atmosphere contains less than 19.5 percent oxygen, and/or
  - The presence of incompletely identified vapors or gases is indicated by a direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the skin. This involves atmospheres posing Immediate Danger to Life and Health (IDLH) concentrations of specific substances that present severe inhalation hazards and that do not represent a severe skin hazard or that do not meet the criteria for use of air-purifying respirators.
- Level C – The concentration(s) and type(s) of airborne substance(s) is known and the criteria for using air purifying respirators are met. The following constitute Level C equipment:
  - Full-face or half-mask air purifying respirators (NIOSH approved)
  - Hooded, chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls)
  - Coveralls or BDUs
  - Gloves, outer, chemical-resistant
  - Gloves, inner, chemical-resistant
  - Boots (outer), chemical-resistant steel toe and shank
  - Boot covers, outer, chemical-resistant (disposable)
  - Hard hat/US&R helmet
  - Escape mask
  - Face shield
- Level C – Level C protection should be used when:

- The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect or be absorbed through any exposed skin,
  - The types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is available that can remove the contaminants, and/or
  - All criteria for the use of air-purifying respirators are met.
- Level D – A work uniform affording minimal protection, used for nuisance contamination only. The following constitute Level D equipment:
    - Coveralls or BDUs
    - Gloves
    - Boots/shoes, chemical-resistant steel toe and shank
    - Boot covers, outer, chemical-resistant (disposable)
    - Safety glasses or chemical splash goggles
    - Hard hat/US&R helmet
    - Escape mask
    - Face shield
  - Level D – Level D protection should be used when:
    - The atmosphere contains no known hazard and
    - Work functions preclude splashes, immersion, or the potential for unexpected inhalation of, or contact with, hazardous levels of any chemicals.
- (5) The coveralls in the cache can be worn over the Level B and Level C suit for mechanical protection.
- (6) In uncharacterized and unknown environments, Level B should be used as the minimum level of initial protection.
- (7) The National Fire Protection Association (NFPA) identifies the following three Chemical Protective Clothing (CPC) categories:
- NFPA 1994 Class 2 CBRN Protective Ensemble and Ensemble Elements. A protective ensemble and ensemble elements designed to protect personnel at terrorism incidents involving vapor or liquid chemical hazards in which the concentrations are at or above Immediately Dangerous to Life and

Health (IDLH), requiring the use of self-contained breathing apparatus (SCBA).

- NFPA 1994 Class 3 CBRN Protective Ensemble and Ensemble Elements. A CBRN protective ensemble and ensemble element designated to protect personnel at terrorism incidents involving low levels of vapor or liquid chemical hazards in which concentrations are below (IDLH), permitting the use of CBRN Air-Purifying Respirators (APR), or Powered Air-Purifying Respirators (PAPR).
- NFPA 1994 Class 4 CBRN Protective Ensemble and Ensemble Elements. A CBRN protective ensemble and ensemble element designated to protect personnel at terrorism incidents involving biological hazards or radiological hazards where the concentrations are below (IDLH), permitting the use of Air-Purifying Respirators (APR), or Powered Air-Purifying Respirators (PAPR).

(8) Maintenance, Care, & Storage

- Task forces shall follow manufacturers' recommendations regarding the maintenance and care of CPC.
- Task forces shall follow manufacturers' recommendations regarding storage and shelf-life recommendations for the CPC.
- Task forces should develop a CPC rotation schedule to reduce delays that may arise from just-in-time inventories from the manufacturers.



## Appendix D - Respiratory Protection for US&R Personnel

(The following appendix is adapted from the current OSHA 29CFR1910.134 regulation.)

### (1) Permissible Practices

- In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, this shall be accomplished as far as feasible by accepted engineering control measures. When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used.
- A respirator shall be provided to each task force member when such equipment is necessary to protect the health of such task force member. The task force shall provide the respirators which are applicable and suitable for the purpose intended. The task force shall be responsible for the establishment and maintenance of a respiratory protection program. The program shall cover each task force member required to use a respirator.

### (2) Definitions

- **Air-purifying respirator:** means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.
- **Assigned protection factor (APF):** means the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to task force members when the task force implements a continuing, effective respiratory protection program as specified by this section.
- **Atmosphere-supplying respirator:** means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.
- **Canister or cartridge:** means a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.
- **Task force member exposure:** means exposure to a concentration of an airborne contaminant that would occur if the task force member were not using respiratory protection.
- **Filtering face piece (dust mask):** means a negative pressure particulate respirator with a filter as an integral part of the face piece or with the entire face piece composed of the filtering medium.

- **Fit factor:** means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.
- **Fit Test:** means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.
- **High efficiency particulate air (HEPA) filter:** means a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100 and P100 filters.
- **Maximum use concentration (MUC):** means the maximum atmospheric concentration of a hazardous substance from which a task force member can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, the task force must determine a MUC on the basis of relevant available information and informed professional judgment.
- **Powered air-purifying respirator (PAPR):** means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.
- **Self-contained breathing apparatus (SCBA):** means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.
- **Service Life:** means the period of time that a respirator, filter or sorbent or other respiratory equipment provides adequate protection to the wearer.

### (3) Respiratory Protection Program

Task forces shall establish a written respiratory protection program or “can utilize the Sponsoring Agency respiratory protection program” that includes:

- Medical evaluations of all task force personnel required to use respirators
- Fit testing procedures for tight-fitting respirators
- Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations
- Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators



- Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators
- Training of task force personnel in the respiratory hazards to which they are potentially exposed during routine and emergency situations
- Training of task force personnel in the proper use of respirators, including putting on and removing them, any limitation on their use, and their maintenance.

**(4) Selection of Respirators**

- Respirators for IDLH atmosphere
  - The task force shall provide the following respirators for task force member use in IDLH atmospheres:
    - A full face piece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes, or
    - A combination full face piece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply
  - All oxygen-deficient atmospheres shall be considered IDLH.
- Respirators for atmospheres that are not IDLH
  - The employer shall provide a respirator that is adequate to protect the health of the task force member and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.
    - Assigned Protection Factors (APFs): Task forces must use the assigned protection factors listed in Table 1 to select a respirator that meets or exceeds the required level of protection. When using a combination respirator (e.g., airline respirators with an air-purifying filter), task forces must ensure that the assigned protection factor is appropriate to the mode of operation in which the respirator is being used.

Table 1. -- Assigned Protection Factors<sup>5</sup>

Type of respirator <sup>1, 2</sup>	Quarter mask	Half mask	Full face piece	Helmet/hood	Loose-fitting face piece
1. Air-Purifying Respirator	5	<sup>3</sup> 10	50	.....	.....
2. Powered Air-Purifying Respirator (PAPR)	.....	50	1,000	<sup>4</sup> 25/1,000	25
3. Supplied-Air Respirator (SAR) or Airline Respirator					
• Demand mode	.....	10	50	.....	.....
• Continuous flow mode	.....	50	1,000	<sup>4</sup> 25/1,000	25
• Pressure-demand or other positive-pressure mode	.....	50	1,000	.....	.....
4. Self-Contained Breathing Apparatus (SCBA)					
• Demand mode	.....	10	50	50	.....
• Pressure-demand or other positive-pressure mode (e.g., open/closed circuit)	.....	.....	10,000	10,000	.....

**Notes:**

<sup>1</sup>Task forces may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required respirator use is independent of concentration.

<sup>2</sup>The assigned protection factors in Table 1 are only effective when the task force implements a continuing, effective respirator program as required by this section (29 CFR 1910.134), including training, fit testing, maintenance, and use requirements.

<sup>3</sup>This APF category includes filtering face pieces, and half masks with elastomeric face pieces.

<sup>4</sup>The task force must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. This level of performance can best be demonstrated by performing a WPF or SWPF study or equivalent testing. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting face piece respirators, and receive an APF of 25.

<sup>5</sup>These APFs do not apply to respirators used solely for escape. For escape respirators used in association with specific substances covered by 29 CFR 1910 subpart Z, employers must refer to the appropriate substance-specific standards in that subpart. Escape respirators for other IDLH atmospheres are specified by 29 CFR 1910.134 (d)(2)(ii).

- Maximum Use Concentration (MUC)
  - The task force must select a respirator for task force member use that maintains the member’s exposure to the hazardous substance, when measured outside the respirator, at or below the MUC.
  - The task force must not apply MUCs to conditions that are IDLH; instead, they must use respirators listed for IDLH conditions.

- When the calculated MUC exceeds the IDLH level for a hazardous substance, or the performance limits of the cartridge or canister, then task forces must set the maximum MUC at that lower limit.
  - The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.
  - For protection against gases and vapors, the task force shall provide an atmosphere-supplying respirator.
  - For protection against particulates, the task force shall provide an air-purifying respirator (APR). An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR part 84.
- (5) Maintenance and care of respirators. The task force is required to provide cleaning, disinfecting, storage, inspection, and repair of respirators used by task force members. Cleaning and disinfection shall be based on procedures recommended by the respirator manufacturer.
- Storage. All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the face piece and exhalation valve.
  - Inspection. All respirators used in routine situations shall be inspected before each use and during cleaning.



## Appendix E - US&R Standard Radiological Response Operating Guidelines (RadWatch™)

The following information defines the policy and procedures for a standard Radiological Response Operating Guideline to include using the Landauer RadWatch.

### I. During the Pre-Deployment Phase

The RadWatch cache shall be stored in a manner to maintain consistent background radiation levels as much as possible. This is accomplished by keeping the RadWatch cache in a cool, secure location.

### II. During the Task Force Mobilization Phase

- A. Each deploying task force member shall be issued a RadWatch on every deployment. It is recommended that the RadWatch be issued during the Medical Evaluation check-in phase and the assigned RadWatch serial number be recorded in the members medical check-in file.
- B. A master list of assigned serial numbers and team member's names shall be provided to the task force Hazmat Team Manager at the beginning of each deployment.
- C. Two RadWatches shall be randomly selected and identified as "control" RadWatches. The two control RadWatches shall remain at the Point of Assembly under normal storage conditions. The serial numbers of the control RadWatches shall be recorded on the master list of assigned serial numbers and identified as Control 1 and Control 2.
- D. The task force medical check-in staff shall discuss radiation risks with female task force members related to possible pregnancy. Any female identified as pregnant shall be issued a RadWatch and shall comply with OSHA 10 CFR 20.1208, **Dose equivalent to an embryo/fetus during the deployment**, specifically, "section (a) The licensee shall ensure that the dose equivalent to the embryo/fetus during the entire pregnancy, due to the occupational exposure of a declared pregnant woman, does not exceed 0.5 rem."
- E. As recommended by the manufacturer, members shall be instructed to wear the RadWatch **on the wrist continuously throughout the deployment**.

### III. In Transit

The Hazmat Team Manager and Safety Officer shall ensure that task force members are reminded of the importance of RadWatch accountability and the necessity of continuous wear of the RadWatch on the wearers' wrist.

#### IV. During the Deployment/Operational Phase

- A. If no radiation area is identified during the deployment, the RadWatch shall remain in place on the member throughout the deployment; however, the following procedure may be used at the discretion of the Hazmat Team Manager at any time.
- B. If a radiation area is detected (i.e., by an active dosimeter alarm), the Hazmat Team Manager shall ensure that no member enters the radiation area without a personal electronic dosimeter. At the end of each operational period, the Hazmat Specialists will use the personal electronic dosimeter to track, record, and control radiation exposure to task force members. If any abnormal readings are displayed on an electronic dosimeter, or if a member receives greater than 1 Rem, or at any time the Hazmat Team Manager deems necessary, the task force shall request the RadLight reader from the HEPP cache. RadWatches will be read using the RadLight reader as necessary to record, track, and control radiation exposure. After “reading”, the **same RadWatch** will be re-issued to the member.

**Note: This reading will NOT zero the RadWatch. If the RadWatch is read subsequent times during the deployment, the reading will represent an accumulated dose, NOT the dose since the last reading.**

#### V. During the Demobilization Phase

- A. If a radiation area is not identified during a deployment, then a final reading is not required.
- B. If a radiation area is identified, each RadWatch shall be read and the final reading will be recorded in the members’ medical record as the dose of the deployment until replaced with the “legal dose record”.
- C. On return to the task force Point of Assembly, the Hazmat Team Manager shall collect all RadWatches and the control units and coordinate with the task force Logistics Team Manager to have **all** assigned and unassigned task force RadWatches returned to the manufacturer for final reading and zeroing.

#### VI. During Cache Rehabilitation

- A. The task force Logistics Team Manager shall ensure that the RadWatches are sent to and returned from the manufacturer with the appropriate tracking numbers.
- B. The manufacturer will return the now “zeroed” RadWatches back to the task force with a certificate of **legal dose record** list according to the National Voluntary Laboratory Accreditation Process (NVLAP).

- C. The Hazmat and Medical Team Managers will coordinate the cross-referencing of the RadWatch serial numbers with the assigned team member.
- D. The Medical Team Manager shall ensure that the “legal dose record” is received and is entered in each member’s medical file.
- E. The Medical and the Hazmat Team Manager will review all members’ radiation exposure and determine necessary follow up medical monitoring. At a minimum, any member that receives 5.0 rem or greater must receive appropriate medical evaluation and follow-up.

### Appendix F - Legal Dose Record Sample Form



U.S. Department of Homeland Security  
 Washington, D.C. 20472

RECORD ORIENTATION DATE	06/26/2013
OSL SERIAL NUMBER	S00050045
TASK FORCE MEMBER NAME	DM HARDISON
TASK FORCE MEMBER ID	DMH6147
PAGE NUMBER	1 OF 1

VATF2  
 524 Viking Drive  
 Virginia Beach, VA 23452

### LEGAL DOSE RECORD

VALUES GIVEN IN WHATEVER PARAMETERS THE READER GIVES. UNSURE SO I USED uR	DATE												
	6/27/2013												
OPERATIONAL PERIODS													
0600-1200		.012uR											
1800-2200		.008uR											
MOBILIZATION DOSE VALUE		.023mR											
CONTROL DOSE VALUE		.022mR											
TOTALS		.020uR											

NOT FOR OFFICIAL USE



### Appendix G - Radiation Exposure Tracking Aide Sample Form

<b>SAMPLE FEMA US&amp;R Radiation Exposure Tracking Aide (RET-A)</b>	Task Force:	Incident Name:	Date Prepared:	Operational Period:	
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#### Section I. Site Information

Incident Location:	
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#### Section II. Organization

Task Force Leader:	HM Manager:	Technical Information Specialist:	Safety Officer:
Safety Officer:	Entry Team Leader:	Medical Team Manager:	Decon Team Leader:

#### Section III. Dosimetry Findings For Specified Work Period and Location

Name	Time In	Time Out	Total Elapsed Time	Accumulated Dose Prior to Entry	Accumulated Dose During Entry	Total Accumulated Dose To Date	Highest Dose in Control Zone	Dosimeter Used / SN
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

**Section III (cont.) Dosimetry Findings For Specified Work Period and Location**

Name	Time In	Time Out	Total Elapsed Time	Accumulated Dose Prior to Entry	Accumulated Dose During Entry	Total Accumulated Dose To Date	Highest Dose in Control Zone	Dosimeter Used / SN
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
Highest Total Accumulated Dose			Average Total Accumulated Dose			Total of Above Accumulated Doses		
Hazmat Manager			Safety Officer			Medical Manager		