Palm Beach County, Florida

Regional Hazardous Materials Response Teams

Standard Operating Guidelines

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A. PREFACE

This manual is a compilation of a collaborative initiative utilizing subject matter experts currently working in Palm Beach County and throughout the state of Florida. The intent is to implement a common approach to addressing and mitigating hazardous material emergency incidents among all fire service providers throughout Palm Beach County. The information within this manual is based on a review of documents and publications from the following (the hyperlinked documents are included for ease of reference and not intended to define all referenced material):

Federal

- National Incident Management System (NIMS)
  - NIMS Manual (2017)
  - NIMS Incident Complexity Guide (2021)
- Federal Emergency Management Agency (FEMA)
  - Field Operations Guide (2016)
- Occupational Safety and Health Administration (OSHA)
  - 29 CFR 1910.120 – Hazardous Waste Operations and Emergency Response
  - 40 CFR 300 – National Oil and Hazardous Substances Pollution Contingency Plan
  - 40 CFR 310 – Reimbursement to Local Governments for Emergency Response to Hazardous Substance Releases
- International Association of Fire Fighters (IAFF)
  - Training for Hazardous Materials Response: Technician Training Modules
- National Fire Protection Association (NFPA)
  - NFPA 400 – Hazardous Materials Code (2019)
  - NFPA 471 – Recommended Practice for Responding to Hazardous Material Incidents (2002)
  - NFPA 472 – Standard for Competence of Responders to Hazardous Materials/ Weapons of Mass Destruction Incidents (2018)
  - NFPA 473 – Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents (2018)
  - NFPA 475 – Recommended Practice for Organizing, Managing, and Sustaining a Hazardous Materials/Weapons of Mass Destruction Response Program (2017)
  - NFPA 1072 – Standard for Hazardous Materials/Weapons of Mass Destruction Emergency Response Personnel Professional Qualifications (2017)
- International Association of Fire Chiefs (IAFC)
- Department of Transportation (DOT)
  - Emergency Response Guide (ERG) (2016)
- Chemical Transportation Emergency Center
  - CHEMTREC
- Wireless Information System for Emergency Responders
  - WISER
- AskRail by the Railinc Corp. and the Association of American Railroads.
  - AskRail

State

- Florida Department of Transportation
  - Florida D.O.T.
- Florida Fire Chiefs Association (FFCA)
- Florida State Emergency Response Commission (SERC) for Hazardous Materials
  - SERC Guidelines, competency assessment and refresher
  - SERC Field Operations Guide (2016)
- Florida Statute, Rule and Guides
  - Chapter 252 – Emergency Management
  - 62-730 Hazardous Waste
  - 62-731 County and Regional Hazardous Waste Management Programs
  - 62-777 Contamination Cleanup Target Levels
  - 62-780 Contamination Site Cleanup Criteria
  - Florida Field Operations Guide (FFOG) (2012)

Local

- Palm Beach County Laws and Ordinances
  - Chapter 11 Article VI – Hazardous Substance Reporting
  - Chapter 11 Article VII – Regional Hazardous Material Response
  - Chapter 11 Article XII – Petroleum Contamination Cleanup Criteria
  - Ordinance 2017–043 – Palm Beach County Local Amendments to the Florida Fire Prevention Code Chapter 69A-60, Florida Administrative Code
- Palm Beach County Comprehensive Emergency Management Plan (CEMP)
  - PBC CEMP (2020)
- Palm Beach County Fire Rescue Incident Management Manual (2018)
- West Palm Beach Incident Management SOG

This regional hazardous materials response manual is an overview of best practices, procedures, governances, planning, and post incident actions that are intended to guide regional hazardous material responses teams in Palm Beach County.

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B. **DEFINITIONS**

1. **EPA definitions**, as stated in 29 CFR 1910.120 (a) (3):

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

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

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

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

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

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

g. *Hazardous substance* means any substance designated or listed under (1) through (4) of this definition, exposure to which results or may result in adverse effects on the health or safety of employees:
   i. Any substance defined under section 103(14) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (42 U.S.C. 9601).
   ii. Any biologic agent and other disease causing agent which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring.
   iii. Any substance listed by the U.S. Department of Transportation as hazardous materials under 49 CFR 172.101 and appendices; and
   iv. Hazardous waste as herein defined.

h. *Hazardous waste* means –
   i. A waste or combination of wastes as defined in 40 CFR 261.3, or
   ii. Those substances defined as hazardous wastes in 49 CFR 171.8.

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

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

k. *Health hazard* means a chemical or a pathogen where acute or chronic health effects may occur in exposed employees. It also includes stress due to temperature extremes. The term health hazard includes chemicals that are classified in accordance with the Hazard Communication Standard, 29 CFR 1910.1200, as posing one of the following hazardous effects: Acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); aspiration toxicity or simple asphyxiant. (See Appendix A to § 1910.1200—Health Hazard Criteria (Mandatory) for the criteria for determining whether a chemical is classified as a health hazard.)

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

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

n. *Permissible exposure limit* means the exposure, inhalation or dermal permissible exposure limit specified in 29 CFR Part 1910, Subparts G and Z.

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

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

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

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

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

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

2. **PBC ordinance definitions**, as stated in Article VII RHMR Sec. 11-129. - Definitions

a. *Cost*. Any and all necessary and reasonable expense incurred by a regional hazardous materials response team in connection with investigating, minimizing, removing or abating the release of a hazardous substance and/or hazardous waste. Such reasonable cost shall include, but not be limited to: The cost of expendable supplies such as firefighting foam, chemical extinguishing agent, absorbent materials, recovery drums, protective clothing

and testing equipment; cost of equipment operation and/or rental; and actual labor costs of emergency response personnel.

b. *Discharge*. Any intentional or unintentional action or omission resulting in the release, spilling, pumping, pouring, emitting, emptying or dumping of hazardous substance upon public or private property located within the county.

c. *Hazardous material response team*. Organized response team of emergency response personnel, specially trained to recognize, respond to and mitigate hazardous materials emergencies, in accordance with the county comprehensive emergency management plan, and the standards established by the county regional hazardous materials oversight committee.

d. *Hazardous substance*. Any substance or material in a quantity or form, which poses an unreasonable and imminent risk to life, health, safety or welfare of persons or property within the county including, but not limited to, those substances listed in the National Fire Protection Association's "Guide on Hazardous Materials," the EPA's list of extremely hazardous substances, as contained in 40 CFR 355 or the "Florida Substance List", promulgated by State Department of Labor and Security, or by CERCLA in 40 CFR 300.6.

e. *The oversight committee*. The county regional hazardous materials oversight committee.

f. *Response actions*. Any activity which is carried out in response to any discharge/release or threatened discharge/release of any hazardous substance, including but not limited to: Investigating, monitoring, assessing, containing, cleaning up or disposing of hazardous substances.

g. *Responsible party*. One (1) or more person, persons, partnership, corporation, joint ventures, association or other entities or any combination thereof found, upon investigation by a regional hazardous materials response team, to have caused or contributed to the discharge or release of a hazardous substance.

h. *Technical review team*. A three-person review team, to be appointed by the oversight committee comprised of chief fire officers from fire-rescue departments within the county.

C. **ABBREVIATIONS**

The following is a list of acronyms and abbreviations that are used in the Emergency Response Plan and Standard Operating Guidelines.

ACGIH	American Congress of Governmental Industrial Hygienist
AHJ	Authority Having Jurisdiction
ALOHA	Area Location of Hazardous Atmosphere
ALS	Advanced Life Support
APR	Air Purifying Respirator
ASR	Area of Safe Refuge
BLS	Basic Life Support
CAMEO	Computer Aided Management of Emergency Operations
CANUTEC	Canadian Transport Emergency Center
CBC	Complete Blood Count
CBRNE	Chemical, Biological, Radiological, Nuclear, Explosive
CFR	Code of Federal Regulations
CHEMTREC	Chemical Transportation Emergency Center
CRZ	Contamination Reduction Zone
CWP	County Warning Point
DOT	Department of Transportation
ECG	Electrocardiogram
EMS	Emergency Medical Service
EOD	Explosive Ordinance Disposal
EPA	U.S. Environmental Protection Agency
ER	Emergency Room
ERG	Emergency Response Guidebook
FBI	Federal Bureau of Investigation
FL	Florida
FRO	First Responder Operations level trained personnel
HME	Homemade Explosive
HMSO	Assistant Safety Officer - Hazardous Materials
IAP	Incident Action Plan
IC	Incident Commander
ICS	Incident Command System
IDLH	Immediately Dangerous to Life and Health
IED	Improvised Explosive Device
IMS	Incident Management System
IV	Intravenous
LEL	Lower Explosive Limit
Med Grp Sup	Medical Group Supervisor
MSDS	Material Safety Data Sheet
NFA	National Fire Academy
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health

OSHA	Occupational Safety and Health Administration
PAPR	Powered Air Purifying Respirator
PASS	Personal Alarm Signaling System
PBC DEM	Palm Beach County Division of Emergency Management
PPE	Personal Protective Equipment
RHMRT	Regional Hazardous Materials Response Team
RHMRT SOG's	Regional Hazardous Materials Response Team Standard Operating Guidelines
PEL	Permissible Exposure Limit
PIO	Public Information Officer
PPE	Personal Protective Equipment
RA	Refuge Area
RBC	Red Blood Cell Count
RDD	Radiological Dispersion Device
SAR	Supplied Air Respirator with escape bottle
SCBA	Self Contained Breathing Apparatus
SDS	Safety Data Sheet
SETIQ	Sistema de Emergencia para la Transportaction de la Industria Quimca
SOG	Standard Operating Guideline
Spec	Specialist
STCC	Standard Transportation Commodity Code
SWP	Florida Division of Emergency Management State Warning Point
Tech	Technician
TLV	Threshold Limit Value
Tox-Medic	Paramedic trained to provide toxicological assistance
TWA	Time Weighted Average
UN #	United Nations Identification Numbers
VOC	Volatile Organic Compounds
WMD	Weapons of Mass Destruction

D. GOVERNANCE

1. **Authority**
    a. It is the intent of this RHMRT SOG to enhance existing systems and provide a consistent level of hazardous materials response capability throughout Palm Beach County. This RHMRT SOG should complement existing SOG's and is not intended to supplant or usurp existing emergency response plans of any agency.
    b. The authority for each RHMRT to operate is granted by Palm Beach County Code of Ordinances Chapter 11, Article VII Regional Hazardous Materials Response, Florida State Statue Chapter 252 (Emergency Management), additional Florida State Statutes, 40 CFR 300 (National Oil and Hazardous Substances Pollution Contingency Plan), and 40 CFR 310 (Reimbursement to Local Governments for Emergency Response to Hazardous Substance Releases). The RHMRT shall respond to ensure the health, safety, and welfare of residents and visitors of Palm Beach County at the request of the responsible agency within the requesting jurisdiction. The RHMRT shall respond with personnel and equipment as defined in this document.
    c. This RHMRT SOG is intended to comply with the minimum requirement of 29 CFR 1910.120(q)(1) for the RHMRT. This RHMRT SOG in combination with the Site Safety and Control Plan (ICS 208 HM) are intended to comply with all the elements of 29 CFR 1910.120(q)(2).

2. **Roles and Responsibilities**
    a. The activation of the RHMRT in no way releases the requesting jurisdiction of its role and responsibility in the mitigation of a hazardous materials release.
    b. The RHMRT role in response to a hazardous materials incident is one of confinement and containment, with incident priorities of life safety, incident stabilization, property conservation, environmental protection, and evidence preservation. The jurisdiction receiving services from the RHMRT will be responsive to the technical input and ensure personnel safety in accordance with RHMRT Standard Operating Guidelines (SOG's).
    c. The Hazardous Materials Group Supervisor, Incident Safety Officer, and Assistant Safety Officer – Hazardous Materials (HMSO) shall have the authority to alter, suspend, or terminate any strategy, tactic or action considered unsafe and shall immediately notify the Incident Commander (IC).
    d. Once the emergency has been stabilized and the threat to life safety has been concluded, the RHMRT shall release the site to the responsible agency. The RHMRT assumes no responsibility in the cleanup of materials. Oversight of cleanup operations shall be handled by the appropriate agency unless there is a specific reason for the RHMRT to remain involved. The RHMRT shall not enter into contracts, or make commitments to contractors for the cleanup of an incident site.
    e. RHMRTs shall be able to perform, provide and establish:
        i. Hazard and Risk Assessments
        ii. Technical information and guidance to the Incident Commander with regard to actions relating to hazardous materials and incident safety
        iii. Public protective action options
        iv. Documentation

v. Site safety recommendations
vi. Resource considerations
vii. Control zones
viii. Decontamination
ix. Monitoring requirements
x. Appropriate levels of Personal Protective Equipment (PPE) protection
xi. Hazardous Materials Control strategies and tactics. These mitigation tactics include, but are not limited to:
    1. Confinement
        a. Absorption
        b. Adsorption
        c. Blank
        d. Damming
        e. Diking
        f. Dilution
        g. Dispersion
        h. Diversion
        i. Neutralization
        j. Retention
        k. Vapor dispersion
        l. Vapor suppression
    2. Containment
        a. Patching
        b. Plugging
        c. Repositioning
        d. Sealing
        e. Remote valve shutoff
        f. Auxiliary closure devices (i.e., Dome Cover clamps, etc…)
        g. Overpacking
        h. Product flaring
        i. Product transfer

f. The media is considered a valuable asset, and it is important to keep the public competently informed about the threat and progression of a hazardous materials incident. The requesting jurisdiction's Incident Commander or Incident Commanders designated Public Information Officer (PIO) is responsible for dissemination of information to the public. Should the situation and resources allow, a RHMRT member, selected by the Hazardous Materials Group Supervisor, may be designated to provide technical details to the IC or PIO.

3. **Notifications**
    a. All notifications should be done as outlined below in order to provide a reliable and consistent method of notification and dispatch for the governmental jurisdictions within Palm Beach County.

b. The complaint-receiving agency shall notify the RHMRT of any hazardous material incident within their jurisdictional boundaries that exceeds the capability of the local responders. The requesting agency shall provide:
    i. The location of the incident.
    ii. The Name and location of Command.
    iii. A resource status report of units on the scene.
    iv. A situation status report of the current situation.
    v. The type and quantity of hazardous material involved (if known).
    vi. The communication and TAC channel utilized.
c. For all RHMRT response requests, one (1) RHMRT shall respond as the initial response. The requesting agency shall respond one (1) ALS transport capable EMS unit for the purpose of providing medical surveillance and treatment to RMHRT members.
d. When the situation is identified as involving extremely hazardous substances, and an Immediately Dangerous to Life and Health (IDLH) environment exist, the RHMRT will advise the IC of the need for a Toxicological Paramedic (Tox-Medic). Tox-Medic shall mean any Paramedic trained to provide toxicological assistance in accordance with RHMRT SOG's as outlined in Toxicology Protocols.
e. The requesting agency will also ensure that sufficient resources are on-site to facilitate decontamination of RHMRT members. This usually includes four (4) hazardous materials First Responder Operational (FRO) level trained personnel as a minimum, performing decontamination under the direction of one (1) RHMRT member.
f. All RHMRTs should be capable of having the ability to respond within five (5) minutes of request for assistance. If a RHMRT is unable to respond within five (5) minutes of request, the RHMRT shall notify the Palm Beach County Fire Rescue (PBCFR) Communications Center to implement notification procedures for the next available RHMRT as outlined in Dispatching.
g. If the scope, location, or profile of an incident requires an additional RHMRT, the Hazardous Materials Group Supervisor, IC or RHMRT Coordinator may initiate the request.
h. Support responders shall be requested through the ICS at the direction of the Hazardous Materials Group Supervisor with the concurrence of the IC. A list of support responders shall be maintained with 24-hour contact numbers by the Palm Beach County Division of Emergency Management (PBCDEM).
i. The PBCDEM County Warning Point (CWP) shall be notified of all responses of a RHMRT and shall notify the Florida Division of Emergency Management State Warning Point (SWP). The PBCFR Communications Center shall notify the PBCDEM and CWP of all responses of a RHMRT. The PBCDEM shall then notify the SWP. If a RHMRT is working on a hazardous material incident in their primary response area, they shall notify the PBCFR Communications Center for documentation and operational purposes.

4. **Review and Revision**
    a. This RHMRT SOG shall be reviewed at least annually for effectiveness and best practices. The annual review shall consist of at a minimum:
        i. Equipment changes
        ii. Contact information updates

iii. Federal, State and Local Regulations.

b. This RHMRT SOG shall be revised every five (5) years, at a minimum.

c. This RHMRT SOG must be consistent with the:

i. Palm Beach County Comprehensive Emergency Management Plan

ii. District 10 Local Emergency Planning Committee Plan

iii. State Emergency Response Commission Plan

iv. Florida Department of Emergency Management Comprehensive Emergency Management Plan

v. National Contingency Plan for Oil and Hazardous Substance Releases

5. **Competencies**

a. RHMRTs shall maintain written SOG's for the various tasks they may perform. RHMRTs shall have a written policy for response. RHMRTs shall maintain all appropriate documents. In addition to the certificates of competency that are maintained by the employer for each RHMRT member, the employer shall maintain records of initial and refresher training as required by 29 CFR 1910.120(q)(6).

b. There are five (5) levels of Hazardous Materials training:

i. First Responder Awareness level

ii. First Responder Operations level

iii. Hazardous Materials Technicians

iv. Hazardous Materials Specialist

v. Hazardous Materials Incident Commander

c. Hazardous Materials training levels responsibilities:

i. First Responder Awareness level have four goals or responsibilities: Recognition and Identification, Isolation, Protection and Notification

ii. First Responder Operations (FRO) level, in addition to the First Responder Awareness level, take defensive control measure.

iii. Hazardous Materials Technicians and Specialists, in addition to the FRO level, take offensive control measures.

iv. Hazardous Materials Incident Commanders must be trained to at least the FRO level and be able to implement and run a Hazardous Materials Incident Command System.

d. All RHMRT members shall:

i. have completed, as a minimum, a curriculum in compliance with:

1. the Florida State Emergency Response Commission's (SERC) Guidelines for Public Sector Hazardous Materials Training
2. Hazardous Materials Technician
3. OSHA 29 CFR 1910.120(q)(6)

ii. be certified competent by their employer and possess documentation of certification.

iii. receive annual refresher training and re-certification by their employer in accordance with 29 CFR 1910.120(q)(6).

iv. be, at a minimum, Florida State Certified Emergency Medical Technicians

e. In addition to the RHMRT member requirements, all Hazardous Materials Group Supervisors shall have completed a curriculum in compliance with NFPA 472 Chapter 10, which states the Hazardous Materials Group Supervisor shall be trained to meet all competencies:
    i. at the awareness level
    ii. at the operations level
    iii. at the technician level
    iv. and of chapter 10 (Competencies for Hazardous Materials Officers).
        1. "when responding to HM/WMD incidents, the Hazardous Materials Group Supervisor shall be able to perform the following tasks:
            a. Analyze a HM/WMD incident…;
            b. Plan a response…;
            c. Implement a response…;
            d. Evaluate the progress…;
            e. Terminate the incident…"
f. All RHMRT members shall be able to function in any role within the RHMRT with the exception of the Hazardous Materials Group Supervisor.
g. Emergency responders, that are not Hazardous Material Technicians, are most likely to be the first to arrive on the scene of a CBRNE incident. Emergency responders within Palm Beach County should train all emergency responders to at least a First Responder Operations (FRO) level.

6. **Oversight Committee**
    a. The board of county commissioners appointed a five-member oversight committee to establish the standards and review the effectiveness of delivering hazardous materials emergency response services on a regional basis. More information is available in the Palm Beach County Code of Ordinances Chapter 11, Article VII, Section 11-130 Oversight committee.

E. PLANNING

1. Identifying Hazardous Materials/WMD within a Jurisdiction

a. The objectives of pre-incident planning are to prevent and prepare for incidents. Both are important and both save lives. Hazards can be identified and plans can be prepared before life threatening situations occur.
b. Facilities should be analyzed to determine if there are trends or predictable events, or if there is a particular class of hazardous material that poses an unusual or grave threat. On the federal level, the Superfund Amendments and Re-Authorization Act (SARA), Title III, Emergency Planning and Community Right-to-Know requires owners to provide information about hazardous materials, emergency response plans, and notification regarding unexpected chemical releases.
c. The requesting agency should have a pre-incident plan for all facilities that store, handle, process, or transport hazardous materials. The appropriate first due RHMRT may be consulted to assist with developing that pre-incident plan. RHMRTs are encouraged to frequently conduct site visits to high consequence 302 facilities.
d. More information is available in the Palm Beach County Code of Ordinances Chapter 11, Article VI Hazardous Substance Reporting (specifically Sec 11-107 Investigations and Site Inspections).

2. Levels of response

a. Palm Beach County will utilize a Uniform Classification for Categorizing Hazardous Materials Incidents as outlined in the NIMS Incident Complexity Guide (see Appendix G).
b. Level V (Five)
    i. Least severe
    ii. *Resistance to Stabilization or mitigation*: **None**
c. Level IV (Four)
    i. *Resistance to Stabilization or mitigation*: **Low**
d. Level III (Three)
    i. *Resistance to Stabilization or mitigation*: **MODERATE**
e. Level II (Two)
    i. *Resistance to Stabilization or mitigation*: **High**
f. Level I (One)
    i. Most severe
    ii. *Resistance to Stabilization or mitigation*: **High**
g. All levels may involve evacuation from a very limited to large scale over considerable periods of time. The resources required at the different levels will depend on the urbanized area and the size (resources) of the response agency.
h. Each jurisdiction within Palm Beach County shall respond to and stabilize all Level V incidents within their response area. The capability and therefore the definition of a Level V incident will vary from jurisdiction to jurisdiction. In all cases the Incident Commander should ensure that appropriate measures, complying with all applicable regulations are followed.

i. On Level IV and above incidents it shall be the policy of the RHMRT to contain or secure hazardous materials only to the extent that there is no longer an immediate threat to life, property or the environment outside of the emergency site.

3. **Staffing**
   a. Each RHMRT shall be a group of at least seven (7) hazardous materials technicians, designated by the participating organization. These RHMRT members are expected to perform work to reduce or eliminate any hazards to people, property, or the environment from an actual or potential hazardous substance release.

4. **Medical Surveillance Program**
   a. All RHMRT Members must be enrolled in a medical surveillance program complying with 29 CFR 1910.120(f) and as further defined in this RHMRT manual.
   b. The medical surveillance program shall be preventative in nature and used to establish a baseline for future reference.
   c. The medical surveillance program shall be in compliance with 29 CFR 1910.120 (Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, see Appendix D ref. #10), NFPA 473 and any other applicable documents. An occupational physician shall conduct the medical exams. The physician shall be provided copies of the above documents. Furthermore, the medical surveillance program should be conducted with input from an industrial hygienist.
   d. Medical exams shall be conducted on the following schedule:
      i. Prior to assignment on the RHMRT.
      ii. At least every 12 months.
      iii. Prior to separation from the RHMRT.
      iv. As deemed necessary by attending physician.
      v. Upon appearance or complaint of signs or symptoms of an exposure.
      vi. In cases of exposure or suspected exposure above the PEL.
   e. Medical exams shall consist of the following:
      i. A complete medical history or update thereto.
      ii. A complete occupational history or update thereto.
      iii. Physical exam to include but not necessarily limited to:
         1. Blood chemistry profile
         2. CBC
         3. Urinalysis
         4. RBC Cholinesterase (exposure to Organophosphates)
         5. Heavy Metal screening.
         6. ECG (12 lead)
         7. Vision, hearing and pulmonary function tests.
         8. Chest x-ray (may be done every two years.)
         9. Stress test.
         10. Comprehensive physical exam.

f. Medical Records
   i. The physician shall maintain copies of all medical exams, with a copy given to the RHMRT member.
   ii. The employer shall make arrangements to provide the medical records immediately upon emergency notice.
   iii. It is the responsibility of the employer (with approval from each RHMRT member) to ensure that records are updated after each exposure or medical exam.
   iv. The employer shall be furnished written notice relating only to each member's ability to perform or restrictions in performance.
   v. The attending physician shall review records annually for the purpose of identifying and correcting abnormal trends.

5. **Equipment**
   a. Selection
      i. All members of the RHMRT shall been trained in the proper use and selection of specialized protective equipment.
      ii. More information can be found at NFPA 1989, 1991, 1992, 1994, Florida Hazardous Materials FOG section 1.5, IAFF Training for Hazardous Materials Technician Module 7 and OSHA/NIOSH Interim Guide for CBRN PPE Selection Matrix.
      iii. **Chemical protective clothing**
         1. Chemical protective clothing shall be selected based upon the:
            a. Physical hazards present in the work area (i.e., sharp metals, confined spaces, fire, dangerous noise levels, etc…).
            b. Chemical hazards of the material (if known).
            c. Physical state of the material (solid, liquid, gas).
            d. Potential routes of exposure (i.e., inhalation, contact, absorption, etc…).
            e. Anticipated job function.
            f. Proximity to and contact with the material (i.e., incidental contact, repeated contact, immersion, etc…).
            g. Published exposure limits.
            h. Possibility of an Immediately Dangerous to Life and Health (IDLH) existing.
            i. Anticipated oxygen concentrations.
            j. Chemical compatibility.
         2. Chemical compatibility of protective garments shall be based upon manufacturer test data, including ASTM chemical test battery, when available.
      iv. **Respiratory protection**
         1. Standard risk analysis and OSHA regulations shall be used to determine whether respiratory protection is needed.
         2. OSHA requirement 1910.120 (q) (3) (iv) states that:
            a. Employees engaged in emergency response and exposed to hazardous substances presenting an inhalation hazard or potential inhalation hazard shall wear positive pressure SCBA … Until such time as the person

in charge of the ICS determines through the use of air monitoring that a decreased level of respiratory protection will not result in hazardous exposure to employees.

b. In other words, positive pressure SCBA is assumed necessary unless it can be definitively proven that no airborne hazards exist.

3. There is no provision for deviation from the use of a positive pressure SCBA to an air purifying respirator during initial entry at an emergency situation. The availability and maximum level of protection afforded by the positive pressure SCBA dictates it's use to ensure personnel safety during initial emergency operations at a hazardous materials incident.
4. Supplied air respirators shall not be utilized in Hot Zone activities while IDLH conditions exist or are expected.

b. <u>Chemical Protective Clothing</u>

i. The following types of Chemical Protective Clothing should be considered when selecting protection from hazards:

1. Level A NFPA 1991 Vapor Protective
2. Level A Non-NFPA 1991 Vapor Protective
3. Level B Encapsulating
4. Level B Non-Encapsulating
5. Level C
6. Level D

ii. **Level A**

1. Level A is vapor tight chemical protective clothing and is the maximum level of protection for chemical environments. This level of protection shall be selected when the highest level of dermal, respiratory, and eye protection is required.
2. Level A chemical protective ensembles are comprised of the following parts:
   a. Vapor tight fully encapsulating limited use NFPA 1991 compliant protective garment (chemically compatible and as applicable).
   b. One hour rated, positive pressure SCBA (NFPA compliant).
      i. Supplied air respirators may only be utilized during decontamination and shall not be used during entry.

c. Communications device.
d. Flame Resistant Jumpsuit and hood (as applicable).
e. Head Protection.
f. Boots (chemically compatible).
g. Gloves (chemically compatible).
h. Inner gloves.
i. Marking to identify personnel (recommended).

3. When the situation dictates the use of Level 'A' ensembles:
    a. Personnel shall be monitored for signs and symptoms of heat stress.
    b. And the ambient temperatures are above 70ºF:
        i. A maximum of 20 minutes of work time shall be allowed.
        ii. Active cooling shall be provided.
    c. A minimum of 60 minutes of rest shall be allowed prior to reentry.
    d. Vital signs and hydration shall be monitored prior to donning and after doffing.
    e. RHMRT entry team personnel shall not make more than two (2) work cycles in a 24-hour period.
    f. It is recommended that personnel performing two (2) work cycles are relieved from duty and the position be back filled and documented in accordance with the cost recovery guidelines.

iii. **Level B**

1. Level B is chemical protection from liquid splash and particulate. It is not intended to protect the wearer from gases and hazardous vapors that are absorbable by the skin.
2. Level B chemical protective ensembles are comprised of the following parts:
    a. Fully encapsulating or hooded chemical protective garment (chemically compatible).
    b. One hour rated SCBA (may be inside or outside the suit) NFPA compliant.
    c. Communication Device.
    d. Flame Resistant Jumpsuit and hood (as applicable).
    e. Head Protection.
    f. Boots (chemically compatible).

g. Gloves (chemically compatible).
h. Inner gloves.
i. Marking to identify personnel (recommended).

3. Level B chemical protective garments are not vapor tight.
4. When the hooded Level B chemical protective garment is used, the SCBA is worn on the outside of the garment and subsequently exposed to the hazardous environment.
5. When the encapsulating Level B chemical protective garment is used, the SCBA is worn on the inside of the garment. The same precautions with personnel usage and medical monitoring shall be in-place as for Level 'A' protection.

iv. **Level C**



1. Level C chemical protective garments may be used by the RHMRT with the proper precautions.
2. Level C chemical protective garments are utilized when the atmosphere is known and quantified. There is no IDLH condition, and conditions are not expected to deteriorate as identified in the site assessment.
3. Level C chemical protective ensembles are comprised of the following parts:
    a. Hooded chemical protective garment (chemically compatible).
    b. Air Purifying Respirator with a full face piece, as a minimum.
    c. Communication Device.
    d. Flame Resistant Jumpsuit and hood (as applicable).
    e. Head Protection.
    f. Boots (chemically compatible).
    g. Gloves (chemically compatible).
    h. Inner gloves.
    i. Marking to identify personnel (recommended).
4. The atmosphere shall be monitored constantly when using Level C chemical protective ensembles.

v. **Level D**



1. Level D protective ensembles are work uniform affording minimal protection: used for nuisance contamination only. This includes station wear, structural firefighting protective ensembles, and normal (non-emergency) workplace protections.
2. Structural firefighting protective ensembles provide limited chemical and excellent thermal protection.
3. Level D protective ensembles are comprised of the following parts:
    a. Coveralls or structural firefighting protective ensembles.
    b. Escape mask, as a minimum.
    c. Face shield, as a minimum.
    d. Safety glasses or chemical splash goggles, as a minimum
    e. Normal Work Uniform.
    f. Communication Device.
    g. Head protection.
    h. Boots (chemically compatible).
    i. Gloves (chemically compatible).
    j. Inner gloves.
4. When Level D protective ensembles are used:
    a. Instrumentation and air monitoring must be in place to detect any dangerous or changing conditions.
    b. Normal rehabilitation and personnel monitoring shall be accomplished as per Fire Operations SOG.
5. It is important to remember that the components of structural firefighting protective ensembles (i.e., leather belts, radio straps, bailout kits, etc…) cannot be decontaminated from many chemical products.

vi. **Multi-threat ensembles**

1. Multi-threat ensembles are ensembles in accordance with NFPA 1994 - Standard on Protective Ensembles for First Responders to Hazardous Materials Emergencies & CBRN Terrorism Incidents which are characterized as Class I, 2, 3, or 4.
2. Multi-threat ensembles are comprised of the following parts:
    a. Hooded chemical protective garment (chemically compatible).
    b. Air Purifying Respirator or SCBA with a full face piece, as a minimum.
    c. Communication Device.
    d. Head Protection.
    e. Boots (chemically compatible).
    f. Gloves (chemically compatible).
    g. Inner gloves.
    h. Marking to identify personnel (recommended).
3. Class 1 ensembles should be used when:
    a. Unknown substance, unknown concentration
    b. Involving chemical vapor or liquid chemical hazards
    c. Concentrations are at/above IDLH
    d. Require the use of SCBA
4. Class 2 ensembles should be used when:
    a. Involving chemical vapor or liquid chemical hazards
    b. Concentrations are at/above IDLH
    c. Require the use of SCBA
5. Class 3 ensembles should be used when:
    a. Involving low levels of chemical vapor or liquid hazards
    b. Concentrations are below IDLH
    c. Use of APR or PAPR is permissible
6. Class 4 ensembles should be used when:
    a. Biological or radiological particulate hazards
    b. Concentrations are below IDLH
    c. Use of APR or PAPR is permissible

vii. **Maintenance, Use, Storage and Testing**

1. Personal protective equipment shall be used, stored, and maintained in accordance with manufacturer's recommendations, and applicable policies and Guidelines.
2. Annual testing of Level A chemical protective ensembles shall be accomplished in accordance with 29 CFR 1910.120 appendix "A" and the manufacturer's recommendations.
3. Each Level A chemical protective ensemble shall have its own individual log.
4. All usage, testing, decontamination and exposure information shall be recorded from acceptance to disposal.

c. Respiratory Protective Equipment

i. All Respiratory equipment shall meet appropriate OSHA and NIOSH approvals in accordance with 29 CFR 1910.120 and 29 CFR 1910.134.

ii. RHMRT members shall be trained and fit tested in the use of all respiratory protective equipment utilized by that RHMRT.

iii. The following types of Respiratory Protection should be considered when selecting protection from hazards:

1. Positive Pressure Self-Contained Breathing Apparatus (SCBA)
2. Closed Circuit SCBA (Rebreathers)
3. Positive Pressure Supplied Air Respirator (SAR)
4. Air Purifying Respirator (APR)

iv. **Positive Pressure Self-Contained Breathing Apparatus (SCBA)**

1. Positive pressure SCBAs are also known as open-circuit SCBAs, where air is exhaled directly into the ambient atmosphere.
2. Positive Pressure SCBAs provide the highest level of respiratory protection and is the most widely used respiratory protection for fire service responders.
3. The most acceptable respiratory equipment for emergency response into IDLH conditions is a positive pressure Self-Contained Breathing Apparatus meeting the requirements of NFPA 1981 and 29 CFR 1910.134.
4. Positive pressure air prevents contaminants from leaking into a rescuer's mask should a leak in the mask seal occur.
5. The positive pressure SCBA is not dependent on a remote supply of air or filtering harmful toxins from an atmosphere.

6. The duration of the air supply is an important planning factor in positive pressure SCBA use. This is limited by the amount of air carried and its rate of consumption.
7. Positive pressure SCBAs are bulky and heavy, thus they increase the likelihood of heat stress and may impair movement in confined spaces.

v. **Closed Circuit SCBA (Rebreathers)**

1. In a closed-circuit SCBA, exhaled air is recycled by removing the carbon dioxide with an alkaline scrubber and by replenishing the consumed oxygen with oxygen from a solid, liquid, or gaseous source.
2. As required by 30 CFR Part 11.80, all compressed breathing gas cylinders must meet minimum U.S. Department of Transportation requirements for interstate shipment.
3. One of the problems of closed circuit SCBAs is the heat generated within the units. Some require a cooling pack to be inserted into the unit before use. The cooling pack, which is stored in a freezer, cools the exhaled air. Sixty-minute closed circuit SCBAs typically use a special salt as a cooling mechanism to remove heat from the exhaled air.

vi. **Supplied-Air Respirator (SAR)**

1. A Supplied-Air Respirator (SAR) are also known as a Supplied-Air Breathing Apparatus (SABA).
2. Supplied-Air Respirators are breathing systems that use a long high-pressure hose connected to a cart that carries two or more cylinders that provide air to the rescuer.
3. Supplied-Air Respirators are designed for longer duration use than SCBA.
4. Supplied-Air Respirators effectively eliminate the risk of air depletion associated with the of SCBA, further ensuring complete and thorough decontamination of personnel.
5. Supplied-Air Respirators eliminate the weight and bulk of SCBA air cylinders.
6. Emergency escape air cylinders mounted to the harness should be used in conjunction with Supplied-Air Respirators.

7. Supplied-Air Respirators may be utilized in confined space operations where the situation dictates.
8. Supplied-Air Respirators shall meet or exceed the requirements of OSHA 29 CFR 1910.134 and have appropriate regulatory approvals.
9. Air Lines for Supplied-Air Respirators shall not exceed 300 feet from the air source.

vii. **Air-purifying Respirators (APR)**

Full Face APR

Half Face APR

Positive Pressure APR

1. Air-purifying Respirators are filter type masks. Some Air-purifying Respirators may be powered with a battery powered fan to ensure positive pressure on the face, these are called Powered-Air Purifying Respirators (PAPRs).
2. A chemical or biological incident may last as long as 12 hours or more, creating a respiratory protection requirement that exceeds the practicability of compressed breathing air protection.
3. Air-purifying Respirators (APR) may be utilized when all of the following are meet:
    a. The air contaminants have been identified and measured.
    b. The oxygen content is between 19.5 and 23.5 %.
    c. A canister is available that can remove the contaminant.
    d. The atmospheric contaminants, liquid splashes or other direct skin contact will not adversely affect any exposed skin.
    e. The personnel utilizing the APR have completed fit testing for the facepiece.
4. A precaution of the PAPR system is the potential for heat stress as a result of extended-duration duty.

d. Technology

i. Regulatory compliance will be ensured during all monitoring and sampling activities. Monitoring and sampling activities will be carried out in compliance with OSHA CFR 1910.120, 40 CFR Part 311 and NFPA 471, and any other applicable standards.

ii. A general and very brief overview of equipment available to RHMRTs:

1. Multi Gas Meters (Oxygen, HCN, CO, H_2S, Combustible Gas Indicators, etc…).
    a. These meters are able to detect a variety of gases or vapors by allowing air to diffuse into a sensor or by drawing a sample of air through its hose.
2. Detector Tubes

a. Detector tubes respond to a specific chemical or group of chemicals and only indicate if they are present.

3. Radiation Survey Meters
    a. Radiation survey meters are used to determine the type of radiation present (alpha, beta, gamma) and its level.
4. Personal Dosimeters
    a. Personal dosimeters monitor the accumulated dose of radiation received.
5. Photoionization Detectors
    a. Photoionization detectors (PIDs) are general survey instruments designed to detect organic vapors and gases in the low ppm range.
6. Flame Ionization Detectors
    a. Flame ionization detectors (FIDs) can be used for general surveys, or as a qualitative instrument that can detect organic vapors and gases in the low ppm range.
7. Infrared Spectrometer
    a. An infrared spectrophotometer is an analytical instrument used to identify materials including organic polymers by determining the functional groups in molecules.
8. GS/MS (Gas chromatography/Mass Spectrometry)
    a. GC/MS is an instrumental technique, comprising a gas chromatograph (GC) coupled to a mass spectrometer (MS), by which complex mixtures of chemicals may be separated, identified and quantified
9. Raman Spectrometer
    a. Raman spectroscopy measures the scattering of light by matter. The light source used in Raman spectroscopy is a laser.
10. Bio-Sampling kits
    a. Bio-Sampling kits may be used as the initial step to investigate suspicious powders which may contain bioterrorism agents.

e. See Appendix B – Hazmat Detection Equipment

6. **Training**
    a. As outlined in Competencies, annual refresher training and re-certification shall be in accordance with 29 CFR 1910.120(q)(6), which states:
        i. "Training shall be based on the duties and function to be performed by each responder of an emergency response organization. The skill and knowledge levels required for all new responders, those hired after the effective date of this standard, shall be conveyed to them through training before they are permitted to take part in actual emergency operations on an incident. Employees who participate, or are expected to participate, in emergency response, shall be given training in accordance with … Hazardous Materials Technician …"
    b. RHMRTs shall receive annual refresher training of sufficient content and duration to maintain their competencies, or shall demonstrate competency in those areas at least yearly. At a

minimum RHMRT shall utilize the Florida SERC Competency Refresher Check-Off. The Competency Refresher Check-Off was developed directly from the NFPA 472, Competency of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents, 2015 Edition and incorporated components from the Florida Field Operations Guide (FOG). The following subjects are covered in the Florida SERC Competency Refresher Check-Off:

i. Section 1: – Analyzing the Incident
   1. 7.2.1 Surveying Hazardous Materials/WMD Incidents
   2. 7.2.2 Collecting and Interpreting Hazard and Response Information
   3. 7.2.3 Describe the Condition of the Container Involved in the Incident
   4. 7.2.4 Predicting Likely Behavior of Materials and Their Container Where Multiple Materials are Involved.
   5. 7.2.5 Estimating the Likely Size of an Endangered Area

ii. Section 2: – Planning the Response
   1. 7.3.1 Identifying Response Objectives
   2. 7.3.2 Identifying the Potential Response Options
   3. 7.3.3 Selecting Personal Protective Equipment
   4. 7.3.4 Selecting Decontamination Procedures
   5. 7.3.5 Developing a plan of Action
   6. 7.3.6 EOD/HazMat Team Interface

iii. Section 3: – Implementing a Planned Response
   1. 7.4.1 Performing Incident Command Duties
   2. 7.4.2 Using Protective Clothing and Respiratory Protection
   3. 7.4.3 Performing Control Functions Identified in Incident Action Plan (IAP)
   4. 7.4.4 Cargo Tanks
   5. 7.4.5 Performing Decontamination Operations Identified in the IAP

iv. Section 4: – Evaluating Progress
   1. 7.5.1 Evaluating the Effectiveness of the Control Functions
   2. 7.5.2 Evaluating the Effectiveness of the Decontamination Process

v. Section 5: – Terminating the Incident
   1. 7.6.1 Assisting in the Debriefing
   2. 7.6.2 Assisting in the Incident Critique
   3. 7.6.3 Reporting and Documenting the Incident

vi. ***Note*** The SERC notations of NFPA 472 are not always accurately referenced (i.e., in the 2018 version of NFPA 472, 7.3.2 is Selecting PPE not 7.3.3). The SERC numerical values are still referring to the previous (2015) version of NFPA 472. When there is a discrepancy, the title name should be used over the numerical values.

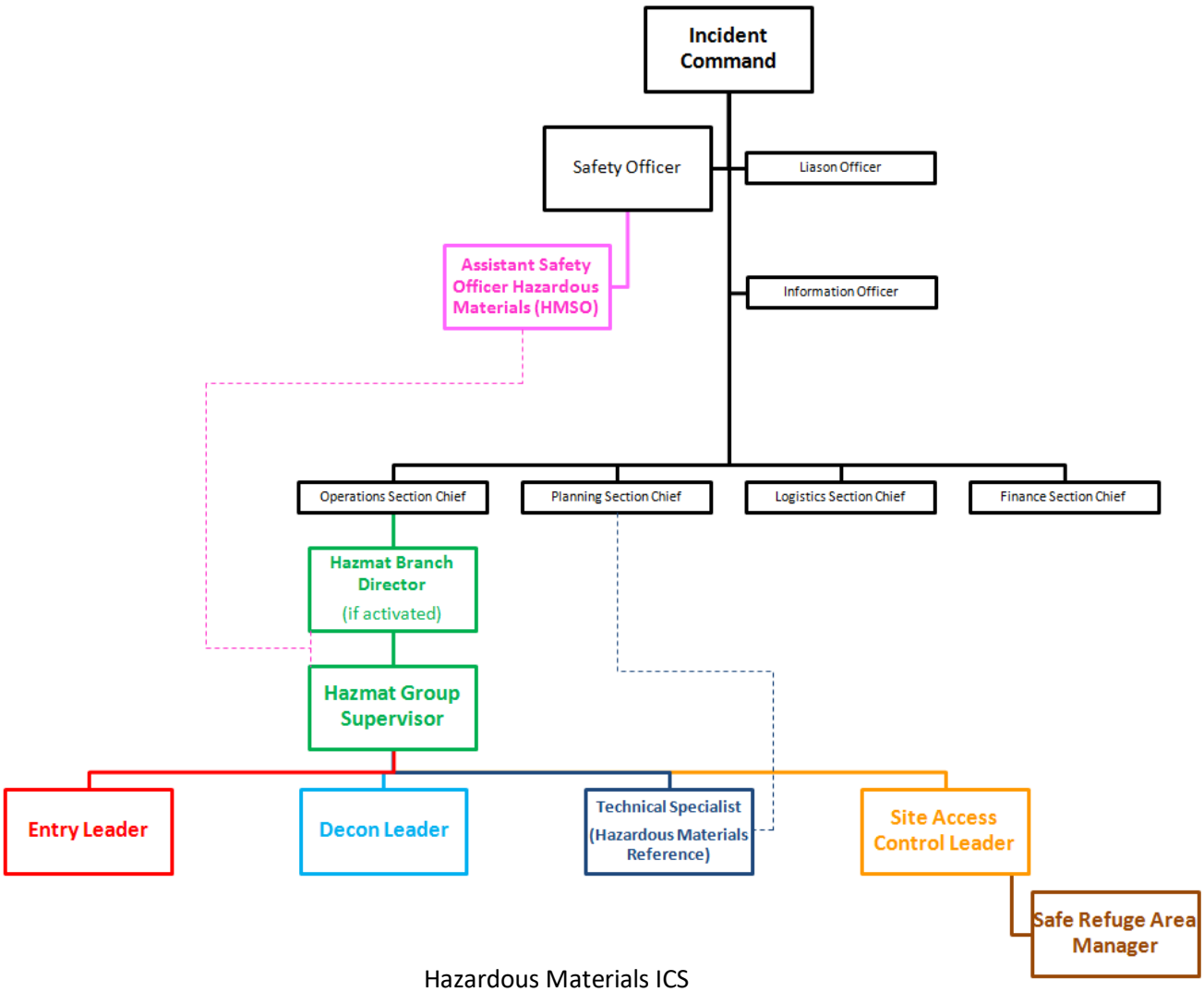
7. **Response Zones**
   a. Palm Beach County has been divided into four (4) geographical areas in order to provide equitable services countywide. Each geographical area is assigned a RHMRT for its primary response. The geographical areas associated with each zone are defined in Appendix H.
   b. There will be four (4) geographic zones in Palm Beach County, with each zone being served by a RHMRT consisting of at least seven (7) Hazardous Material Technicians. These RHMRTs will

provide first due response for Level I, II, and III incidents in their assigned zone, and backup response for other zones. Each zone will have one (1) designated access point that will be used to dispatch the appropriate RHMRT.

8. **Dispatching**
    a. When an incident requires the response of a RHMRT, the IC shall request their respective Communications Center contact the PBCFR Communications Center to dispatch the appropriate RHMRT. The PBCFR Communications Center shall notify the appropriate RHMRT by one of the following methods:
        i. For incidents in Zones 1, 2 and 3, the PBCFR Communications Center shall dispatch the appropriate RHMRT through the station/unit alerting system.
        ii. For incidents in Zone 4, the PBCFR Communications Center shall contact the Boca Raton Communications Center by direct telephone line and pager. The PBCFR Communications Center shall contact the Delray Beach. These centers shall then dispatch their RHMRT to the incident.
    b. The individual responding units shall acknowledge their response with their respective Communications Center. Units operating on PBCFR Tactical Channels shall notify the PBCFR Communications Center when they are:
        i. Enroute to the incident.
        ii. Arrival at the incident.
        iii. Injury of a RHMRT member.
        iv. Transporting any patient to a hospital.
        v. Commencing extended operations.
            1. Extended Operations are incidents that are four (4) hours or greater in duration.
        vi. Completed and Available from the incident.

F. INCIDENT MANAGEMENT

1. **ICS General**
   a. Both the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 and the Environmental Protection Agency (EPA) 40 CFR Part 311 state: The senior emergency response official responding to a (chemical) emergency shall become the individual in charge of the site specific Incident Command System. This means that all hazardous materials responders must operate using an Incident Command System (ICS).
   b. Organizational Structure
      i. The ICS organizational structure develops in a modular fashion from the top down at any incident; the specific ICS organizational structure for a hazardous materials emergency is based on the incident needs. Only the module components necessary to execute tactical objectives should be implemented.
      ii. The Incident Commander and Incident Safety Officer are always appointed. If other positions of responsibility are not appointed, the Incident Commander assumes those duties.



Hazardous Materials ICS
(Diagram 1)

iii. The establishment and operation of an Incident Management System at a Hazardous Materials Incident shall in no way conflict with the Incident Management System presently utilized by Fire and Emergency agencies within Palm Beach County.
iv. All requesting agencies shall utilize the Incident Command System as adopted by the Palm Beach County Fire Chief's Association.
v. RHMRTs are to function in a "support" role for all incidents regardless of the level of response. The RHMRT function is to operate as the Hazardous Materials Group within the Incident Management System, not to take command of the incident or to replace the responders who are functioning in other areas of the IMS structure being utilized by the on scene Incident Commander.

c. IC Responsibilities
   i. The Incident Commander (IC) has the authority and responsibility to ensure the health and safety of personnel and the public throughout a hazardous materials incident emergency.
   ii. The IC at a hazardous materials incident shall direct the overall management, strategies and coordination of the incident. The IC is responsible for the identification, procurement and coordination of resources to protect life, stabilize the incident, conserve property and the environment, and preserve evidence.
   iii. The IC is not responsible for detailed direction of specialized procedures, but shall ensure that procedures are being implemented that will accomplish the strategies. Scene management decisions shall be made with input from the RHMRT and Technical Specialist. Concurrence on strategies, tactics, and implementation is an absolute necessity.
   iv. All hazardous materials responses in Palm Beach County that utilize the RHMRTs shall have two (2) groups of personnel that are operating at the scene.
      1. The first group are those personnel that are utilized for the purpose of functions outside the scope of the Hazardous Materials Group, and shall be First Responder Operational (FRO) level personnel (29 CFR 1910.120 q.6.ii). These personnel will usually be from the local jurisdiction or mutual aid response units requested by the authority having jurisdiction.
      2. The second group are those personnel that are directly involved in the Hazardous Materials Group and shall be properly trained Hazardous Materials Technicians (29 CFR 1910.120 q.6.iii). These personnel will usually be members of one or more of the RHMRTs. Some FRO level personnel may be called upon to perform certain functions, within the Hazardous Materials Group, under the direction of a Hazardous Materials Technician.
   v. In order to avoid mistakes or confusion the IC and Hazardous Materials Group Supervisor should communicate with each other and others directly by email, cell phone, or face to face.

d. Establishment of Command
   i. The first arriving unit at a Hazardous Materials incident shall establish Command and utilize the county wide personnel accountability system.

ii. All personnel and units shall be accounted for at all times.
iii. Command shall be established utilizing a unique identification for the designated command name.
iv. The RHMRT shall work within the requesting agency's Incident Command System (ICS) to take such actions as maybe necessary to safely mitigate, remove or abate the effects of a hazardous materials release or threat of release.
v. In the absence of an ICS or IC the Hazardous Materials Group Supervisor shall:
    1. Establish Command and request additional supervisory personnel for an ICS.
    2. Conference with the most senior official from the requesting jurisdiction and determine if it is appropriate to establish a Unified Command.
vi. Should the Hazardous Materials Group Supervisor become committed to a Unified Command position, another qualified Hazardous Materials Group Supervisor shall be appointed (even if that means requesting an additional RHMRT).

2. **Operational Periods**
    a. The RHMRT shall utilize four (4) hour operational planning periods initially on all hazardous materials incidents necessitating an entry mission.
    b. When an incident is projected to extend past a single entry mission, an additional team may be called. Any operation that extends beyond the first operational period (4 hours), the next due RHMRT team shall be notified, for notification purposes (i.e., if one RHMRT team is on scene - a second team shall be notified of an active incident, if two RHMRTs teams are on scene - a third team shall be notified of the active incident, etc…).
    c. When the incident is or is projected to be four (4) hours or greater in duration, the Hazardous Materials Group Supervisor shall notify the IC and the County Warning Point. The PBC Communications Center shall notify each RHMRT coordinator with a situation report.
    d. The IC shall ensure addition logistical needs are obtained as necessary, these may include but not be limited to sanitary facilities, food and liquids. The four (4) hour planning period also allows for recall of off-duty personnel.
    e. Extended Operations is any hazardous materials incident that are four (4) hours or greater in duration.
    f. Extended operations mandate the need for rotating of personnel, thereby needing additional personnel resources as well as establishing a logistics function to ensure adequate availability of material resources.
    g. It would be prudent of the IC to establish a finance function to track incident associated cost whenever extended operations are encountered.
    h. Expanding incidents shall follow NIMS guidelines with notification to the County Warning Point. At minimum, situation reports (Sit Reps) shall be provided to the County Warning Point every 4 hours that are suitable for public consumption.

3. **Hazardous Materials Group Supervisor**
    a. When the RHMRT arrives, a briefing shall occur between the IC and the Hazardous Materials Group Supervisor. The Hazardous Materials Group Supervisor shall assume responsibility for tasks designated by the IC.

b. The Hazardous Materials Group Supervisor may be designated as the Hazardous Materials Branch Director if the event is of sufficient size or complexity.
c. The Hazardous Materials Group Supervisor shall designate an Assistant Safety Officer – Hazardous Materials (HMSO). The HMSO position must be appointed and present during all operations at a hazardous materials incident.
d. The Hazardous Materials Group Supervisor shall have ultimate authority and responsibility over the RHMRT members. Hazardous Materials Group Supervisors have the authority to transfer their responsibilities to another Hazardous Materials Group Supervisor or the RHMRT Coordinator with the concurrence of the IC. The Hazardous Materials Group Supervisor shall not challenge or usurp the IC's decisions unless it jeopardizes life safety.
e. The Hazardous Materials Group Supervisor should insure that the RHMRT vehicles are located in the proper place to facilitate the work of the RHMRT. This does not necessarily need to be in close proximity to the Incident Command post.
f. Although the Incident Commander retains overall control and authority at the incident, the RHMRT shall be allowed to work in a safe and uncompromising environment. If a conflict arises regarding the aforementioned, the Incident Commander and the Hazardous Materials Group Supervisor shall meet and resolve any issues. Any decision not to execute an order shall be documented in writing by the Hazardous Materials Group Supervisor referencing the appropriate Standard Operating Guidelines or safety issues.
g. Hazardous Materials Group Supervisor responsibilities
    i. Reports directly to the Operations Section Chief, or the Hazardous Materials Branch Director (if established).
    ii. Directs the overall operations of the Hazardous Materials Group.
    iii. Implements the hazardous materials element of the incident action plan.
    iv. Assigns resources within the Hazardous Material Group.
    v. Reports the progress of operations and status of resources within the group.
    vi. Oversees the primary functions provided by the Hazardous Material Group.
    vii. Oversees entry into the Hot Zone as supervised by the Entry Leader.
    viii. Oversees decontamination as supervised by the Decontamination Leader.
    ix. Oversees site access control as supervised by the Site Access Control Leader.
    x. Coordinates with the Assistant Safety Officer - Hazardous Materials.
    xi. Coordinates with technical specialists.
    xii. Checklist of activities:
        1. Check in and obtain briefing.
        2. Ensure the development of control zones and access control points and placement of appropriate control lines.
        3. Evaluate and recommend public protection action options to Operations Section Chief or Branch Director (if activated).
        4. Ensure that current weather data and future weather predictions are obtained.
        5. Establish environmental monitoring of the hazard site for contaminants.
        6. Ensure that a Site Safety and Control Plan (ICS 208 HM) is developed and implemented.
        7. Conduct safety meetings with the Hazardous Materials Group.
        8. Participate in development of incident action plan.

9. Ensure that recommended safe operational guidelines are followed.
10. Ensure that proper PPE is selected and used.
11. Ensure that appropriate agencies are notified through the Incident Commander.
12. Maintain unit log (ICS Form 214).

4. **Assistant Safety Officer – Hazardous Materials**
   a. Position required on all Hazardous Materials incidents by 29 CFR 1910.120 (q) [3][vii].
   b. In a multi activity incident, the Assistant Safety Officer- Hazardous Materials does not act as Incident Safety Officer for the overall incident.
   c. Has the authority to stop or prevent unsafe acts.
   d. Assistant Safety Officer – Hazardous Materials responsibilities
      i. Reports to the Incident Safety Officer.
      ii. Coordinates with the Hazardous Materials Group Supervisor or Hazardous Materials Branch Director (if activated).
      iii. Coordinates safety related activities directly relating to operations of the Hazardous Materials Group, as mandated by 29 CFR part 1910.120 and applicable State and local laws.
      iv. Advises the Hazardous Materials Group Supervisor or Hazardous Materials Branch Director (if activated) on all aspects of health and safety.
      v. Checklist of activities:
         1. Obtains a briefing from the Hazardous Materials Group Supervisor.
         2. Participates in preparation and implementation of the Site Safety and Control Plan (ICS 208 HM).
         3. Advises the Hazardous Materials Group Supervisor or Hazardous Materials Branch Director (if activated) of any dangerous situations or deviations from the Site Safety and Control Plan (ICS 208 HM).
         4. **Has the authority to alter, suspend, or terminate any activity that may be judged to be unsafe, and must communicate that intent or action to the Hazardous Materials Group Supervisor.**
         5. Ensures the protection of Hazardous Materials Group personnel from physical, environmental, and chemical hazards or exposures.
         6. Ensures the provision of required emergency medical services for assigned personnel.
         7. Coordinates with the Medical Unit Leader or Medical Group Supervisor.
         8. Ensures that medical related records for the Hazardous Materials Group personnel are maintained.
         9. Maintains unit log (ICS Form 214).

5. **Entry Leader**
   a. Reports to the Hazardous Materials Group Supervisor.
   b. Responsible for overall entry operations within the Hot Zone.
   c. Training to the Hazardous Materials Technician level, at a minimum.
   d. Checklist of activities:

i. Supervises Entry operations.
ii. Recommends actions to mitigate the situation within the Hot Zone.
iii. Carries out actions, as directed by the Hazardous Materials Group Supervisor, to mitigate hazardous materials release or threatened release.
iv. Maintain communications and coordinates operations with the Decontamination Leader.
v. Maintains communications and coordinates operations with the Site Access Control Leader and Safe Refuge Area Manager (if activated).
vi. Maintain communications coordinates operations with the Technical Specialists – Hazardous Material Reference.
vii. Maintains control of the movement of people and equipment within the Hot Zone, including contaminated victims.
viii. Directs rescues operations as needed in the Hot Zone.
ix. Maintains unit log (ICS Form 214).

6. **Decontamination Leader**
   a. Reports to the Hazardous Materials Group Supervisor.
   b. Responsible for decontamination operations.
   c. Provides decontamination as required by incident action plan (IAP).
   d. Training to the Hazardous Materials Technician level, at a minimum.
   e. Checklist of activities:
      i. Establishes Contamination Reduction Corridor(s).
      ii. Identifies contaminated people and equipment.
      iii. Supervises the operations of the decontamination element in the process of decontaminating people and equipment.
      iv. Maintain control of movement of people and equipment within the Contamination Reduction Zone (CRZ).
      v. Maintains communications and coordinates operations with the Entry Leader.
      vi. Maintains communications and coordinates operations with the Site Access Control Leader and Safe Refuge Area Manager (if activated).
      vii. Coordinates the transfer of contaminated patients requiring medical attention (after decontamination) to the Medical Unit Leader or Medical Group Supervisor.
      viii. Coordinate handling, storage, and transfer of contaminants within the Contamination Reduction Zone.
      ix. Maintains unit log (ICS Form 214).

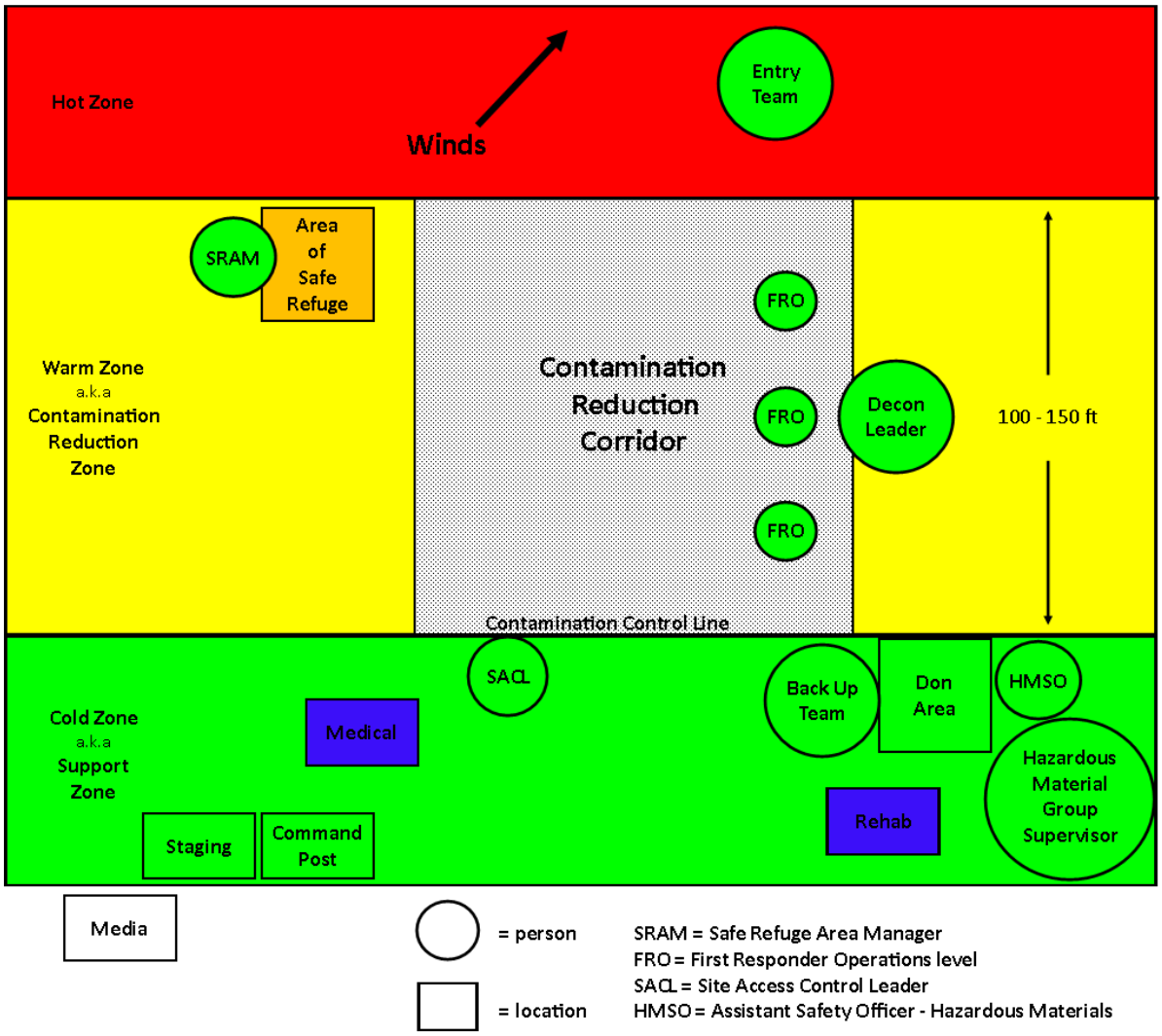
7. **Technical Specialist – Hazardous Material Reference**
   a. Reports to the Hazardous Materials Group Supervisor or Hazardous Materials Branch Director (if activated).
   b. Provides technical information and assistance to the Hazardous Materials Group.
   c. Uses various reference sources available.
   d. Provides product identification methods to categorize or identify unknown materials.
   e. Obtains briefing from the Planning Section Chief (if activated).

f. Provides technical support to the Hazardous Materials Group Supervisor.
g. Maintains communications and coordinates operations with the Entry Leader.
h. Provides and interprets environmental monitoring information.
i. Provides analysis of hazardous materials samples.
j. Determines PPE compatibility to hazardous materials.
k. Provides technical information of incident for documentation.
l. Provides technical information management with public and private agencies.
m. Assists the Planning Section Chief in projecting potential environmental effects of release.
n. Maintains unit log (ICS Form 214).

8. **Site Access Control Leader**
    a. Reports to the Hazardous Materials Group Supervisor.
    b. Responsible for control of movement of all people and equipment through appropriate access routes at hazard site.
    c. Ensures that contaminants are controlled and records are maintained.
    d. Training to the hazardous materials technician level, at a minimum, and is highly desirable.
    e. Checklist of activities:
        i. Organizes and supervises assigned personnel to control access to hazard site.
        ii. Oversees placement of the Hot Zone Control Line and Contamination Control line.
        iii. Ensures appropriate action is taken to prevent spread of contamination.
        iv. Establishes an Area of Safe Refuge within the Contamination Reduction Zone adjacent to the Contamination Reduction Corridor and the Hot Zone Control Line.
        v. Appoints the Safe Refuge Area Manager (as needed).
        vi. Ensures that injured or exposed individuals are decontaminated prior to leaving the hazard site.
        vii. Tracks the movement of persons passing through the Contamination Control Line to ensure that long term observation is provided.
        viii. Coordinates with the Medical Unit Leader or Medical Group Supervisor for proper separation and tracking of potentially contaminated people needing medical attention.
        ix. Maintains observations of any changes in climatic conditions or other circumstances external to hazard site.
        x. Maintains communications and coordinates operations with the Entry Leader.
        xi. Maintains communications and coordinates operations with the Decontamination Leader.
        xii. Maintains unit log (ICS Form 214).

9. **Safe Refuge Area Manager**
    a. Reports to the Site Access Control Leader.
    b. Coordinates with the Decontamination Leader.
    c. Coordinates with the Entry Leader.
    d. Evaluates and prioritizes victims for treatment.
    e. Collects information from the victims.
    f. Prevents the spread of contamination by victims.

g. If the Safe Refuge Area Manager must enter the Contamination Reduction Zone in order to fulfill assigned responsibilities, then the appropriate level of PPE shall be worn.
h. Checklist of activities:
    i. Establishes an Area of Safe Refuge within the Contamination Reduction Zone adjacent to the Contamination Reduction Corridor and the Hot Zone Control Line if not already established by the Site Access Control Leader.
    ii. Monitors the atmospheric conditions of the Area of Safe Refuge to ensure it is not subject to any hazardous condition.
    iii. Assists the Site Access Control Leader by ensuring victims are evaluated for contamination.
    iv. Manages the Area of Safe Refuge for holding and evaluates victims who may have information about the incident, or if suspected of being contaminated.
    v. Maintains communications with the Entry Leader to coordinate the movement of victims from any Refuge Area(s) in the Hot Zone to the Area of Safe Refuge.
    vi. Maintains communications with the Decontamination Leader to coordinate the movement of victims from the Area of Safe Refuge into the Contamination Reduction Corridor.
    vii. Maintains unit log (ICS Form 214).



G. **HAZARD MITIGATION**

1. **Response**
    a. The overall success of the hazardous materials incident will depend largely on the initial operations as set up by the first response agency. These first responders are often placed in the position of arriving at the scene of a hazardous materials release with little or no information about the product(s), and are lacking the proper personal protective equipment to operate near the release.
    b. With responder safety in mind, the below items should be considered as a minimum for a safe and effective response.
    c. The first arriving unit shall communicate safe response routes.
    d. Approach the incident from an uphill and upwind position (if possible).
    e. Position all vehicles far enough away from the release to allow for a safe retreat should it become necessary. This should include facing the vehicles away from the scene.
    f. Avoid any contact with the product being released. Personnel should remember that many hazardous materials are colorless and odorless vapors.
    g. Make sure that the initial size up includes the type of situation found and proper response routes for incoming units.
    h. Consider all drums, containers, cylinders, and tanks as being full, and the materials in them to be hazardous materials, until proven otherwise.
    i. Pertinent information gathered as the incident unfolds shall be relayed to the Communications Center and responding units.

2. **Mode of Operations**
    a. All first responders should remember that quick, aggressive action has no place at hazardous materials incidents. Many times, no action may be the only safe action due to the lack of PPE.
    b. Risk management practices should be considered throughout the incident. Do NOT risk life for property or the environment.
    c. FRO level response personnel should remember to address the strategic goals of **Recognition, Isolation, Protection, and Notification** (R.I.P.Not). These are all strategies that can be addressed while operating in a Defensive mode.
    d. There shall be a minimum of seven (7) Hazardous Materials Technicians on-scene prior to any offensive actions by the RHMRT.
    e. Spill control is also an initial strategy which may be considered, but must be accomplished without coming in contact with the product or its vapors. The exception to this is when dealing with certain flammable liquids and flammable gases, which are considered firefighter operations and should be dealt with aggressively and offensively while wearing proper personal protective equipment and having completed the proper training.
    f. FRO level personnel may only take **DEFENSIVE** actions to include:
        i. Diking
        ii. Damning
        iii. Diverting
        iv. Vapor suppression or diversion

v. Fire suppression or exposure protection
vi. Emergency Decontamination
vii. Technical Decontamination (only when supervised by a Hazardous Materials Technician)
viii. Remote valve shutoff activations, only:
    1. If the remote valve shutoff is clearly marked and the FRO knows what will occur, (i.e., at a Gasoline fill station, etc…)
    2. With assistance and direction from plant or facilities personnel.
ix. Moving or relocating **uninvolved** and **stable** containers

g. All DEFENSIVE actions must be accomplished without the FRO level personnel becoming contaminated.

3. **RHMRT Arrival**
    a. Upon the RHMRTs arrival, RHMRT members should prepare to interface with any Hazardous Materials Technicians who are already on the scene as part of the first response agency. The first response agency Hazardous Materials Technicians should be able to gather specific information about the hazardous material, the container, and the environment where the release has occurred. This information will greatly enhance the ability of the regional response team to develop an effective plan of action as well as a Site Safety and Control Plan (ICS 208 HM).
    b. The first response agency Hazardous Materials Technicians may be utilized to enhance and compliment the RHMRT operations at the direction of the Hazardous Materials Group Supervisor. First response agency Hazardous Materials Technicians may be utilized in any position within the Hazardous Materials Group other than Entry Team, the Hazardous Materials Group Supervisor, or any other position that require direct contact with the product.
    c. All jurisdictions within Palm Beach County who presently have Hazardous Materials Technicians should continue to maintain those personnel at that level of certification, with the intent to utilize them to assist and direct those operations that will be handled as Level I incidents, by the local jurisdiction. They should also be utilized to do much of the information gathering and lead in work for the RHMRT on incidents that are elevated to Level II or higher.

4. **Recognition and Identification**
    a. One of the primary objectives during a Hazardous Materials Incident is the identification of the materials and hazards presented by the materials involved and subsequent confirmation of the properties and hazards of these materials.
    b. From a safe distance, first responders should attempt to recognize and identify critical information. Recognition and identification of critical information shall include the following (when available):
        i. Preincident Plans
        ii. Building type
        iii. Occupancy type
        iv. Product information:
            1. Hazard Classification
            2. ERG Guide number
            3. Product Name or CAS (Chemical Abstracts Service) Number

4. Quantity

v. Container information:
   1. Type
   2. Shape
   3. Size

vi. Markings:
   1. UN Numbers
   2. DOT placards

vii. Paperwork:
   1. Shipping papers
   2. Material Safety Data Sheet (MSDS)
   3. Bill of lading
   4. Waybills
   5. Consist

viii. Subject Matter Experts
   1. Drivers
   2. Engineers
   3. Facility Managers

c. Waybills are shipping papers that provide phone numbers, addresses, description of materials, emergency contact and other valuable information.

d. Reference material
   i. The ERG is a good first responder's guide but may be a poor reference because of its generality. Use other sources for detailed information on chemicals and for Hazardous Materials Technician level research.
   ii. On Level II, III, IV incidents, a Hazardous Materials Technician shall be assigned to research the chemical(s) involved. Fire Department members not assigned to the RHMRT shall not be used for this purpose unless that member has specific in-depth knowledge of the product, facility, process or product.
   iii. The member assigned to research shall record all physical properties, incompatibilities, recommended PPE, first aid and antidotal information, decontamination guidelines and any other information that is relevant.
   iv. At least two (2), preferably three (3) sources of reference shall be researched for each chemical involved. This should include books, databases, CHEMTREC, poison control, or other similar material.
   v. Conflicting information shall be interpreted by assuming that the worst case scenario is present, highest or lowest extremes, highest toxicity or reactivity.

e. If the RHMRT is unable to identify the hazardous material, its properties, severity, or the proper stabilization methods, then the IC shall immediately have the Hazardous Materials Group Supervisor seek technical assistance. Technical assistance includes:
   i. Agencies and resources listed in the RHMRT resource list.
   ii. Chemtrec / National Response Center
   iii. Industry technical representatives and hotlines
   iv. Manufacturer and product institutes.
   v. Governmental or environmental resources

f. Railroad Responses

i. During railroad responses the Hazardous Materials Group shall make all attempts to locate the train's crew and conductor. They should have access to the following items:
   1. A special instructions list, which lists the STCC number for each hazardous material on the train and relative position of car from engine.
   2. The trains consist, which displays the relative order of each car on the train, starting with the engine. Hazardous materials on railcars are marked with the word DANGEROUS on the lower portion of the railcar. Paying particular attention to language containing explosives or poisons.
   3. The emergency handling precautions, which shall be provided for each hazardous material on the train.

ii. The AskRail application (www.AskRail.us), which launched in 2014, is a collaborative effort among the emergency response community and all North American Class I railroads. The app provides more first responders with immediate access to accurate, timely data about what type of hazardous materials a railcar is carrying so they can make an informed decision about how to respond to a rail emergency. The AskRail application can be used to access train consists and is updated as train cars are added or taken off of the rail.

g. Acts of Terrorism and WMD
   i. Acts of terror utilizing Weapons of Mass Destruction are essentially a CBRNE incidents with a willful intent to cause harm.
   ii. Responders may not initially realize they are at the scene of a terror attack. Once recognized, responders should:
      1. Be mindful for secondary devices
      2. Be alert for actions against responders
      3. Implement PPE measures (including SCBA use)
      4. Use extreme caution prior to initiating any tactical actions
      5. Preserve evidence
   iii. Indicators of a terror attack, include:
      1. A target hazard or target event location is involved
      2. There is a Credible Threat
      3. CBRNE substances are involved
      4. There are multiple victims
      5. Responders are victims
      6. Responders are becoming victims

5. **Isolation**
   a. Initial Isolation Zone
      i. To begin initial actions at a CBRNE incident, the FRO level must use the below resources:
         1. DOT Emergency Response Guidebook (ERG)
         2. Wireless Information System for Emergency Responders (WISER)
      ii. The Initial Isolation Zone shall be identified and established around the hazard based on the information provided by the ERG or WISER.
      iii. WISER is an application program which includes the ERG information (and more), by the National Institutes of Health (NIH) that is available for use on smart phones.

iv. Follow the actions recommended by the ERG or WISER, remember these are general guidelines intended for use during the first 30 minutes of the incident.
v. When dealing with an unknown product the Initial Isolation Zone shall be a minimum of 330 ft. or as stated in the ERG. When unsure of a distance, first responders should overestimate the Initial Isolation Zone and allow the RHMRT to decrease the size.
vi. The Initial Isolation Zone becomes the Hot Zone when the product is confirmed and additional reference materials confirm the distances.
vii. First responders shall isolate the area without entering the immediate hazard area and ensure the safety of responders and citizens.

b. Area of Safe Refuge
   i. An Area of Safe Refuge (ASR) should be established for victims who are considered contaminated and in need of decontamination.
   ii. Victims who are considered contaminated should not be brought out of the ASR until they can be decontaminated.
   iii. The ASR should be located immediately uphill and upwind of the Hot Zone and near the entrance to the Contamination Reduction Corridor
   iv. The ASR shall be monitored to assure that further contamination of victims is not occurring.
   v. A Safe Refuge Area Manager may be established to manage the victims in the ASR.
   vi. All victims not requiring decontamination shall be directed to move away from the hazard (uphill and upwind) to a specific location or distance.

c. Control Zones
   i. Hazardous material incident zoning is a dynamic process. All personnel need to be aware of and anticipate the possibility of zoning changes based on incident progress.
   ii. The purpose of establishing control zones is to:
      1. Designate areas of specific function
      2. Limit levels of contamination
      3. Provide Areas of Safe Refuge for responders and the public.
   iii. The size and shape of the control zones are determined by the following factors:
      1. Chemical properties
      2. Natural barriers
      3. Quantity of product involved and the amount of the product leaking
      4. Size and condition of the container
      5. Physical state of the product
      6. Weather
      7. Recognized standards and information from resources (i.e., ERG, CAMEO, ALOHA, etc…)
   iv. **Hot Zone (Exclusion Zone)**
      1. The Hot Zone is the area most affected by the hazardous materials release.
      2. The Hot Zone will be distinguished utilizing banner tape, cones, or some other recognizable material.
      3. See exposure limits and action levels (below) for boundaries.
   v. **Contamination Reduction Zone (Warm Zone)**
      1. The Contamination Reduction Zone is an area safe from contamination from the ongoing hazardous materials release.

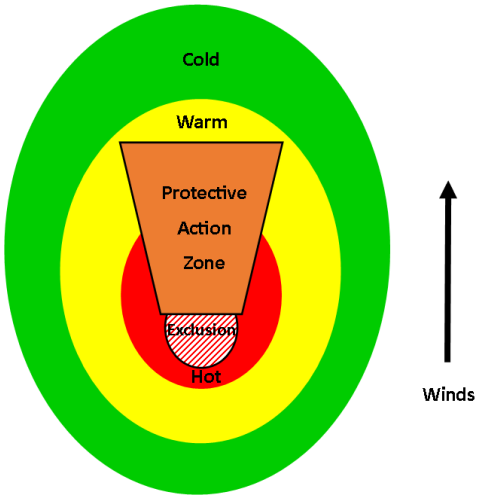
2. The Contamination Reduction Zone shall be distinguished utilizing banner tape, cones, or some other recognizable material.
3. Cross-Contamination, from exposed victims and responders is possible in this area and all personnel entering the Contamination Reduction Zone shall wear the appropriate level of chemical protective clothing.
4. The Contamination Reduction Zone includes the Contamination Reduction Corridor and Area of Safe Refuge near the Hot Zone to prevent the contamination of victims and responders that are not equipped with chemical protective clothing.
5. The Contamination Reduction Zone shall also contain access control points for the Hot Zone.

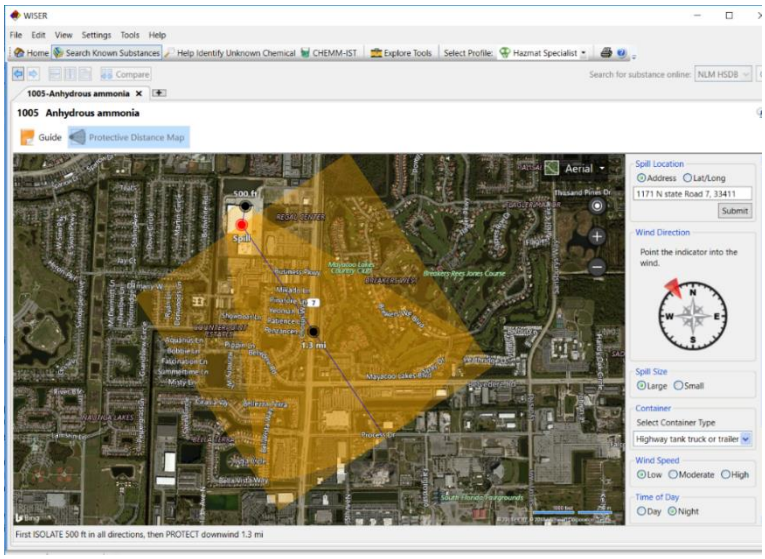
vi. **Support Zone (Cold Zone)**

1. The Support Zone is an area outside the Contamination Reduction Zone that is within the incident perimeter and is contamination free.
2. The Support Zone will be distinguished by utilizing banner tape, cones, or some other recognizable material.
3. The Support Zone is an area where command and control functions occur as well as other functions necessary to support the activities occurring in the Hot Zone and Contamination Reduction Zone.
4. The Support Zone is the functional area that treatment of decontaminated victims, interagency coordination and incident security can be expected to occur.
5. Consideration should be given to establishing an incident perimeter around the Support Zone providing an area for staging, media, and non-essential personnel.

6. **Protection**

a. Protection includes that of the responders, public, property, environment, and evidence.
b. A downwind **Protective Action Zone** shall be identified and evaluated to determine if victims within this area should be <u>evacuated</u> or <u>protected in place</u>. Law Enforcement and the reverse 911 system should be utilized to rapidly alert potential victims and secure the Protective Action Zone.





7. **Contamination and Decontamination**
    a. **Types of Contamination**
        i. There are two main types of contamination: surface contamination and permeation contamination.
        ii. Surface contamination
            1. Surface contamination occurs when product remains on the surface of a protective garment.
            2. Surface contamination is the easier type of contamination to detect and remedy.
        iii. Permeation contamination
            1. Permeation contamination occurs when a contaminant soaks into a protective garment.
            2. Once the product has begun traveling through the material, it is very difficult to detect and remove.
    b. **Methods of Contamination**
        i. There are also two methods of becoming contaminated: direct and secondary contamination.
        ii. Direct contamination
            1. Direct contamination occurs when an object or person comes into direct contact with the contaminant.
        iii. Secondary contamination
            1. Secondary contamination is also referred to as cross-contamination.
            2. Secondary contamination occurs when a clean object or person comes into contact with a contaminated object or person.
            3. Secondary contamination is usually the result of poor management of the scene, inadequate procedures, or procedures that were not followed.
        iv. Prevention of contamination can be accomplished by (where possible or permissible):
            1. Minimizing contact with hazardous substances.
            2. Protecting instruments and equipment by bagging or wrapping in plastic.
            3. Using remote sampling and proper handling techniques.
            4. Wearing disposable chemical protective clothing.
            5. Wearing appropriate chemical protective clothing and respiratory protection.
    c. **General Principles of Decontamination**
        i. Decontamination is the process used to make personnel, equipment, and the area safe by eliminating or reducing exposure to harmful substances.
        ii. Decontamination may be necessary for civilians and/or emergency responders.
        iii. Decontamination procedures can prevent the contaminant from spreading away from the initial area ("secondary contamination") and therefore reduce the chance of exposure to people in other locations.
        iv. When performing Decontamination, the following principles should be observed:
            1. Decontaminate as soon as possible.
            2. Only decontaminate what is necessary.
            3. Decontaminate as far forward as possible.
        v. Avoidance
            1. Staying clean is the best type of decontamination.
            2. The best way to protect yourself is to avoid contamination in the first place.

3. Avoidance can be as simple as reminding responders to walk around puddles or as complicated as using remote devices to accomplish objectives.

vi. The method and type of decontamination will vary, depending on the type of product or products, the physical and chemical properties of the product(s), and the level of contamination.

d. **Types of Decontamination**

i. There are two main types of decontamination: Emergency Decontamination and Technical Decontamination.

ii. Emergency Decontamination

1. Emergency Decontamination procedures are designed to quickly decontaminate a civilian or responder who cannot wait for Technical Decontamination.
2. Emergency Decontamination may be necessary for someone who is in medical distress or has unexpectedly become exposed to a highly toxic chemical.
3. The purpose of Emergency Decontamination is to remove, as quickly as possible, the contaminant from an exposed or ill person.
4. Emergency Decontamination should include stripping away any possibly contaminated clothing and a thorough washing.
5. Emergency Decontamination is usually a deluge type wash with hose line from fire apparatus.
6. Whenever possible, the runoff should be contained or at least directed to a non-sensitive holding area. Life safety takes precedence over containing runoff.

iii. Technical Decontamination

1. Technical Decontamination is the planned and systematic removal of contaminants from personnel and equipment.
2. Technical Decontamination is a formalized set of procedures and equipment that is designed to progressively clean individuals and equipment.
3. Technical Decontamination procedures also provide for the:
    a. Protection of those performing decontamination
    b. Protection of the environment
    c. Isolation of any used equipment or solutions
4. Technical Decontamination is necessary when personnel have used chemical protective clothing for entry into the Hot Zone.
5. Technical Decontamination is supervised by a Hazardous Materials Technician, staffed by First Responder Operations level.

e. **Methods of Decontamination**

i. There are many different methods of decontamination.

ii. Dilution

1. Dilution is the use of water to carry away and/or dissolve or dilute a chemical hazard (i.e., Emergency Decontamination Corridor System, etc…).
2. Dilution is generally combined with washing. Surfactants or other agents are added to water and brushes are used to scrub contaminated items (i.e., thorough decontamination of equipment Post Fire, etc…).

iii. Absorption

1. Absorption is the process of soaking up a liquid contaminant with another medium (i.e., wiping up a spill on the counter with a paper towel, Oil-Dri, etc…).

iv. Adsorption

1. Adsorption is the adherence of a chemical to the surface of another medium. The product does not soak through the medium as it does with an absorbent, but sticks only to the surface (i.e., VOC half-masks, activated charcoal, etc…).

v. Isolation
   1. Isolation is the process of segregating contaminated items from other items and personnel. Placing contaminated items in bags or specifically designated drums is an example of isolation (i.e., Decon Bag for Post Fire Gross Decon, etc…).

vi. Chemical degradation
   1. Chemical degradation is a process in which a hazardous chemical is changed or degraded into another, less hazardous compound by the addition of a non-reactive substance (i.e., using bleach, etc…).

vii. Evaporation
   1. Evaporation is a process where the liquid portion of a contaminant is allowed to evaporate or "off-gas", either completely disappearing or leaving behind solids dissolved or suspended in solution (i.e., hanging Bunker gear, etc…).

viii. Solidification
   1. Solidification is a process by which another agent is added to a hazardous liquid and combines with it physically and/or chemically to produce a solid (this is typically done by contractors, not Fire Rescue).

ix. Vacuuming/Blowing
   1. Vacuuming uses High Efficiency Particulate Filter (HEPA) vacuum systems to remove dust or other solid hazardous materials from personnel or equipment.
   2. Blowing uses compressed air to blow off or remove dust and some liquids (i.e., blowing out the apparatus bay, etc…).

f. **Determination and Priority**

i. The Incident Commander, Hazardous Materials Group Supervisor, Assistant Safety Officer-Hazardous Materials and Decontamination Leader shall determine and concur:
   1. If decontamination is required
   2. The type of decontamination
   3. The method of decontamination

ii. Decontamination should not interfere with immediate lifesaving medical aid, however if emergency aid is to be given without proper decontamination the toxicity of the product must be considered with the minimum exposure to contaminates. In these instances, Emergency Decontamination should be considered.

iii. All victims must be decontaminated that present with (any of the following):
   1. Physical signs or symptoms
   2. Clinical signs or symptoms

iv. Priority
   1. The highest priority for decontamination shall be based on medical conditions and likelihood of contamination.
   2. Factors to determine the highest priority of decontamination, for ambulatory victims are (in priority order), victims:
      a. With serious medical symptoms
      b. Closest to point of release
      c. With evidence of contaminant on clothing or skin
      d. With conventional injuries

e. Reporting an exposure

v. All personnel, equipment and supplies (including apparatus) entering the Hot Zone, or coming in contact with contaminated run off or materials should be considered contaminated and must be decontaminated.

vi. Persistent materials are materials that come in contact with permeable items and may require follow up evaluations to determine the effectiveness of the decontamination process. Ultraviolet light or reagent swipe tests may be needed.

vii. Any personal protective clothing or equipment, which is still suspected of being contaminated after undergoing decontamination, shall be isolated (i.e., placed in sealed disposal drums, etc…), until further technical assistance can be obtained or disposal can be accomplished.

viii. Decontamination of heavy equipment and vehicles may require pressure or steam cleaners, specialized decontamination processes and possibly special retention arrangements.

ix. Any bunker gear or clothing, which may be sent to a commercial laundry or cleaned by an outside vendor, must be accompanied by information about the product or chemical and handling precautions including SDS sheets if applicable.

x. All personnel involved in the decontamination process and that may have been exposed to the possibility of cross contamination shall undergo decontamination.

xi. All decontamination of radioactive contaminated patients or responders should involve consultation with a Florida Department of Health Bureau of Radiation Control.

g. **Decontamination logistics**

i. Decontamination activities take place in the Warm Zone, also known as the Contamination Reduction Zone or CRZ.

ii. All decontamination personnel shall wear the PPE as determined by the Site Safety and Control Plan (ICS 208 HM) and Incident Action Plan.

iii. A competently trained Hazardous Materials Technician shall be assigned as the Decontamination Leader and shall consult with the Hazardous Materials Group Supervisor to determine a suitable area for decontamination.

iv. The area designated for decontamination shall be appropriately marked and defined.

v. Properly trained and protected FRO level personnel may be utilized to perform decontamination, under the direction of the Decontamination Leader.

vi. Victims clothing and effects shall be remove and double bagged if they are suspected of being contaminated. Consideration shall be given to property identification, evidence collection, and chain of custody procedures for all personal property.

vii. All run off from the decontamination process shall be contained and held pending testing and approval of final disposition from the proper authorities (if possible).

viii. Potential make-shift decontamination sites to decontaminate large numbers of victims using local resources include:

1. Public fountains
2. Swimming pools
3. Fire protection sprinkler systems (i.e., in parking garages, etc…)

ix. The Decontamination Leader shall keep accurate records of all personnel, including the agency, going through or physically involved in the decontamination process. The level of PPE worn and contaminate shall also be included in the unit log.

h. **Transport and Patient Considerations**

i. Victims contaminated by hazardous materials only become patients after they have been decontaminated.
ii. Contamination of transport vehicles and hospital facilities must be prevented.
iii. If contaminated victims may migrate to hospital facilities on their own, it is important to establish a civilian decontamination process in collaboration with the hospital facilities.
iv. Transport vehicles and patients packaging may be prepared in a number or ways:
    1. Patients may be wrapped with multiple sheets.
    2. Patients may be contained in a patient isolation chamber (i.e. IsaPod, etc…).
v. All personnel transporting patients shall be wearing appropriate PPE.
vi. The Medical Examiner or Department of Health may be able to provide transport recommendations.
vii. Only deceased persons should be placed in body bags.
viii. Hospital facilities should be communicated with early and often with the following information:
    1. Number of victims
    2. Type and amount of contamination
    3. Medical condition
    4. Time of arrival
    5. When to expect contaminated victims that may migrate to the hospital
ix. The County Warning Point shall be notified should a hospital facility refuse patients based on exposures.

i. **Emergency Decontamination Corridor System**

i. Often the fastest method to begin decontamination on large numbers of people is to construct an Emergency Decontamination Corridor System (EDCS) using two pumpers and/or an Aerial.
ii. The EDCS shall serve the additional function of controlling victim traffic.
iii. The EDCS is a separate corridor through the Warm Zone that serves as a bridge from the Hot Zone to the Cold Zone.
iv. Entry and Exit Control Officers should be in place to safely move victims through the EDCS and ensure thorough washing.
v. Multiple EDCS may be established as resources arrive.
vi. More information is available from the Department of Homeland Security on the Emergency Decontamination Corridor System.

8. **Evidence Preservation and Public Safety Sampling**

a. Evidence preservation

i. All forensically valid samples collected, shall be collected while maintaining a secure chain-of-custody for the sample from the time of collection through laboratory analysis.

The methods used should be consistent with the FBI 12-step process for managing a crime scene, including those involving a WMD.

ii. If air monitoring is conducted in conjunction with a law enforcement investigation (i.e., suspicious powder incident or other criminal investigation), all appropriate chain of custody, sample submission forms and sample container labels shall be completed.

b. Public Safety Sampling

i. All unmarked drums and abandoned containers should be considered as containing hazardous materials until proven otherwise.

ii. Drums and abandoned containers should only be handled if necessary. Contents should be classified or characterized prior to any attempt of moving. Drums that appear to be under pressure should be opened by remote means.

iii. Sealed, non-leaking containers that pose no risk to public safety shall not be opened by RHMRT personnel.

1. Sealed, non-leaking drums, unlabeled containers that pose no risk to public safety shall be secured in a manner to insure public safety with notification to the responsible agency(s).

iv. Sealed, non-leaking containers that pose a significant risk to personnel or the public may be opened by RHMRT personnel with the below precautions and considerations.

1. Opening unknown containers poses a significant risk to personnel and should only be performed under extreme conditions. The opening of sealed containers mandates the following considerations:
    a. A life safety hazard exists and it would be beneficial to open the container.
    b. The closure shall be tested with peroxide test paper.
    c. The container shall be visually inspected for signs of stress (i.e. bulging, weakened areas, cracks, crystals etc.).
    d. RHMRT personnel are wearing the maximum (appropriate) level of chemical protective clothing and respiratory protective equipment.
    e. If any manufacturer or markings are identified, the manufacturer and/or CHEMTREC shall be consulted prior to opening.
2. If the peroxide test is positive, container shows signs of stress, or crystalline formations appear around the opening, DO NOT PROCEED ANY FURTHER and consider the product unstable. In these instances, immediate notification shall occur to the BOMB SQUAD and RHMRT coordinator.

v. Closed containers, that are not suspected to be under pressure or do not pose a significant risk to personnel or the public, shall not be opened for public safety sampling.

9. **Entry Team**

a. An ALS transport unit shall be on scene prior to entry being made. This unit shall be dedicated to treatment and transport of entry personnel only. This unit should be staffed, at the minimum, by paramedics who shall be provided information relating to the products on scene (i.e., routes of entry, signs and symptoms of exposure, treatment procedures etc…).

Toxicological trained paramedics are required when RMHRT members will enter into IDLH conditions involving extremely hazardous materials.

b. Prior to making entry into a Hot Zone for the purpose of incident stabilization, the following steps shall be taken:
    i. A tactical plan shall be completed and reviewed.
    ii. A Site Safety and Control Plan (ICS 208 HM) shall be completed and reviewed.
    iii. A back-up team(s) shall be prepared and ready.
    iv. The appropriate chemical protective clothing shall be selected and verified as outline above (in section E.5.a).
    v. Decontamination shall be established with decontamination systems, solutions, and equipment in place.
    vi. Medical conditions shall be considered with pre-entry hydration performed.
    vii. A pre-entry briefing shall be completed.
c. A pre-entry briefing consists of reviewing:
    i. Preliminary site analysis
    ii. The Site Safety and Control Plan (ICS 208 HM)
    iii. Possible product characteristics.
    iv. The tactical objectives for entry
    v. Atmospheric monitoring guidelines, instruments and expected values
    vi. Communications check (Radio and Hand Signals)
    vii. Emergency evacuation signals
    viii. Locations of area(s) of safe refuge
    ix. Decontamination guidelines and location of the Contamination Reduction Corridor
    x. Estimated work-cycle duration
    xi. Other site-specific information
d. Entry Team
    i. An Entry Team is any crew that performs stabilization, rescue or any other action within the perimeter of the Hot Zone.
    ii. Entry teams shall be comprised of at least two (2) members and shall have at least one (1) back up team dressed and staged in the Contamination Reduction Zone.
    iii. All entries shall be made in pairs, utilizing the buddy system with a back-up team equal to at least the same size as the entry team.
    iv. The RHMRT will maintain sufficient resources on site to facilitate safe entry to the hazardous atmosphere as dictated by the Site Safety and Control Plan (ICS 208 HM).
e. Back Up Team
    i. A Backup Team is any crew that exists to support the Entry Team should they encounter difficulties or require rescue.
    ii. Backup Teams shall be comprised of at least two (2) members.
    iii. Backup Teams may be employed as the relief crew for an entry team at the end of their work cycle at the discretion of the Hazardous Materials Group Supervisor.
    iv. If the Backup Team is deployed for any reason, a new Backup Team shall be dressed and briefed to deploy as soon as possible.

10. **Detection, Monitoring, and Sampling**
    a. Exposure limits and action levels
        i. When making initial entry, the entry team shall:
            1. Monitor for IDLH conditions and exposures above the permissible exposure limits (PELs) or other published exposure levels.
            2. Approach from up-wind and up-grade positions (when possible).
            3. Ensure they are wearing appropriate PPE for the encountered hazards.
        ii. When available, the use of Threshold Limit Values (TLV) shall be used to determine the boundaries of the Hot Zone.
        iii. General Hot Zone Guidelines:
            1. Toxicity - Hot Zone shall be established based on the products monitored readings greater than the published TLV/TWA or PEL exposure values. Any readings falling within these limits shall be considered to be within the Hot Zone.
            2. Flammability - Any readings on a combustible gas indicator shall be considered to be within the Hot Zone.
            3. Oxygen - Oxygen deficient atmospheres are those with readings of 19.5% oxygen or less and oxygen enriched atmospheres are those with reading of 23.5% or greater. When evaluating oxygen deficient atmospheres, consider that the available oxygen may be influenced by the contaminants present. Any area containing oxygen enriched or deficient atmosphere shall be considered to be within the Hot Zone.
            4. Radioactivity - Any reading above background level will be confirmed for the existence of a radiation hazard and shall be considered to be within the Hot Zone.
        iv. OSHA, NIOSH, ACGIH, EPA and AIHA have all set exposure guidelines and limits. Many times the safe value for the same chemicals or hazards are different. With the health and safety of responders and the public in the highest interest, the RHMRT will use the most conservative values listed for a toxic substance.
        v. Combustible Gas Indicator
            1. Known product > 50% L.E.L- explosion hazard, indicates IDLH Condition
            2. Unknown product > 25% L.E.L-explosion hazard, indicates IDLH Condition
            3. Confined space > 10% - explosion hazard, indicates IDLH Condition
        vi. Oxygen concentration
            1. < 10%-16% most Combustible Gas Indicators will not function properly
            2. < 19.5% Monitor wearing SCBA
            3. 23.5% Fire potential for confined space
            4. 25 % Fire potential, consult specialist
        vii. Radiation survey
            1. Greater than twice the background reading requires high and/or low range dosimetry, record keeping and continuous monitoring and consult radiation authorities.
        viii. Toxicity

1. Colormetric tubes, Photoionization detectors, Flame ionization detectors, Bio-Assay, or other technologies. Usage is dependent on product or chemical. Consult reference manuals for toxicity data.

b. Monitoring
   i. The Hazardous Materials Response Team will utilize an assortment of instruments, devices and techniques to accomplish the following:
      1. Identify and quantify airborne contaminants, vapors, gases, liquids, solids, biological, radiological, and other hazardous conditions.
      2. Determine the level of worker protection needed for entry and support personnel.
      3. Assist in defining perimeters, hazard and control zones.
      4. Identify need for medical, toxicological, decontamination, evacuation and risk assessment actions or strategies.
      5. Track changes, verify remediation efforts, record monitoring chronology and determine final or termination levels of product(s).
   ii. Monitoring for unknown products will include the following, in priority order, but may be done in conjunction while considering the primary hazards:
      1. Radioactivity
      2. pH
      3. Combustibility/Flammability/Explosively and Oxygen concentration
      4. Hydrogen Sulfide (if conditions warrant)
      5. Carbon Monoxide (if conditions warrant)
      6. Organic vapor (if conditions warrant)
      7. Specific gasses (if conditions warrant)
      8. Chemical WMD agents (if conditions warrant)
      9. Biological agents (if conditions warrant)
   iii. Monitoring suspected/known products
      1. Radioactivity
      2. pH
      3. Combustibility/Flammability/Explosively and Oxygen concentration
      4. Instrument specific (appropriate for suspected product)

c. Sampling
   i. When air monitoring does not indicate product identification or level of hazard, it may become necessary to perform chemical analysis on the product(s) to determine its identity or hazards.
   ii. When chemical analysis is indicated the following sampling protocols will be implemented:
      1. Safe approach strategies, with appropriate PPE.
      2. Continuous air monitoring.
      3. Buddy system.
      4. Decontamination established before entry.
      5. Follow rules of evidence collection and preservation (if applicable).

6. Remote sampling of product using sample jars and Callowaso tubes (if appropriate).
7. Personnel will minimize contact with the product as much as possible.
8. Decontaminate personnel and the sample jar.

iii. Sampling shall be a single entry team task.
iv. When sampling and field testing is done, the container should be marked as to the main hazard identified.

11. **Victim Rescue**

a. Immediate rescue of victims should only be attempted when the rescuers are able to operate in the proper PPE and all RISK/BENEFIT considerations have been addressed and a scene assessment has been completed.
b. Only quick, line-of-sight Rescue attempts for **viable victims** may be made by FRO level personnel in the Initial Isolation Zone if **ALL** of the following are met:
   i. There is visible movement or chest rise and fall by the victim(s).
   ii. The FRO level personnel are wearing full Bunker gear with SCBA.
   iii. A pre-connected hose line is ready prior to entry.
   iv. The hazard is **NOT** fluorine.
      1. Water treatment facilities may store fluorine.
   v. The FRO level personnel can be dragged out with their Drag Rescue Device (i.e., do NOT enter a container even if it is in line of sight).
c. The FRO level personnel **SHALL NOT** remove their SCBA prior to Decontamination
   i. Do **NOT** enter a tight space
   ii. Expect the Bunker gear to be off gassing
d. In no other instance shall FRO level personnel enter an Initial Isolation Zone or Hot Zone.

12. **Toxicology Protocols**

a. Each RHMRT shall equip and maintain a toxicological drug box containing at the minimum the following: an adequate supply to treat at least (4) 100kg patients according to Palm Beach Regional Hazardous Materials Toxicology Medical Protocols.
b. The above mentioned medications should be administered by a State of Florida Certified Paramedic that has completed an NFPA 473 compliant Tox-Medic training course.
c. The above mentioned medications may be administered only upon direct orders from the receiving ER Physician or per existing Medical Protocols which have been approved by the Medical Director under whose medical license the paramedic is operating.
d. All medications shall be inspected daily by a certified paramedic. Medications and documentation shall be maintained in accordance with all applicable Federal, State and Local requirements

13. **Product Control**

a. The mission specific guidelines outlined in the Florida State Emergency Response Commission (SERC) for Hazardous Materials should be followed for the following: Corrosives, Explosives, Radiological, Tanker Rollover, Biological Incidents, Flaring, Pesticides, Abandoned Drums, Cylinders, Tar Ball Sampling, Marine, and Foam.

b. Chemical – Chemical control techniques should be in accordance with approved State of Florida hazardous materials technician training.
c. Biological – Biological control techniques should be in accordance with approved State of Florida hazardous materials technician training.
d. Radiological/Nuclear (see appendix I).
e. Explosive – An Explosive Ordnance Disposal (EOD) shall be contacted for mitigation and control of explosives.
f. Product Recovery and Disposal
    i. As soon as possible, representatives from appropriate Federal, State and or Local agencies should be summoned to the scene in order to coordinate and oversee recovery and disposal activities. Such representative may or may not be on scene but must be made aware of the situation. Such agencies may include but are not limited to:
        1. County Warning Point
        2. State Warning Point
        3. Palm Beach County Department of Emergency Management
        4. Florida Department of Environmental Protection
        5. United States Coast Guard
        6. PBC Health Department
        7. Department of Transportation.
        8. O.S.H.A.
        9. Law Enforcement Agencies
    ii. Once the product has been secured/stabilized, the responsible party (see: "P.B County, County Wide Regional Hazardous Materials Ordinance of 1998." For definition.) should be allowed reasonable time to secure an acceptable private contractor for the removal and disposal of the product. In some instances, the scene may be turned over to such contractor with the approval of the above-mentioned regulatory agency(s).
    iii. All private contractors shall meet guidelines as set forth in 29C.F.R.1910.120 and shall utilize appropriate P.P.E. and follow all safety guidelines as deemed necessary by the Incident Commander, Safety Officers or Hazardous Materials Group Supervisor.
    iv. If a contractor resists working within the above P.P.E. and safety guidelines, compliance should be coordinated through the entity to which the contractor is contracted. (for example: Department of Environmental Protection) If compliance is not achieved, that contractor's activity shall be terminated until compliance is achieved or another contractor can be procured.
    v. In the event that no responsible party can be identified and the situation warrants expedient removal, the Department of Environmental Protection (D.E.P.) may be utilized to effect recovery and removal. As soon as possible and as safety permits, the scene should be turned over to the appropriate regulatory agency for final disposition. The decision to do so is based upon such factors as the specific product and its hazards, container condition and general scene stability. As a last resort the Incident Commander may elect to contract for recovery and disposal at the expense of the authority having jurisdiction.

vi. Containers used for over packing or product off-loading and modes of transportation shall be compatible with the product.
vii. Incident Commanders that contract directly with a clean-up contractor may follow up to ensure appropriate waste site facilities are used.
viii. In all cases accurate records of employee hours, apparatus and equipment and disposable items used shall be kept so as to facilitate cost recovery efforts.
ix. If a drum or container was found to be leaking, then ground samples should be taken unless the drum/container was on a non-permeable surface.
x. No container should be left on scene unless it has been determined it is safe to leave it and that it has been secured against tampering. If it remains on scene, then it should be secured until picked up or transferred to another agency. (refer to DEP guidelines)
xi. Always notify the State Watch Office and request a call back from the Department of Environmental Protection as outlined in Section H. The DEP Office of Emergency Response can provide technical guidance or further assistance as needed.

14. **Rehabilitation and Medical Evaluations**

a. Rehabilitation of all entry personnel and decontamination personnel will begin immediately upon exit from the decontamination corridor.
b. This function includes medical monitoring as described in the medical program portion of this SOG.
c. A Rehabilitation Group shall be established at all incidents to which a RHMRT responds.
d. The Rehabilitation Group shall be staffed with personnel who are state certified paramedics, approved to perform ALS procedures by the initial response agencies medical director or the personnel's medical director.
e. The Incident Commander shall consider the circumstances of each incident and insure that adequate provisions are secured early in the incident, once it is realized that the 4-hour planning period will be exceeded.
f. Adequate rehabilitation of the responders will insure that the physical and mental condition of the crews operating at the scene will not deteriorate to the point that jeopardizes the responders' safety or the safety and integrity of the overall operation.
g. All Group and Division Supervisors, and Branch Directors should be aware of the condition of each of the crews assigned within their span of control.
h. Relief crews should be requested early in the incident when environmental conditions indicate that a heat stress index above 90º F or a wind-chill index below 10º F will be present.
i. The Rehabilitation Group shall be located in the Support Zone, near the Contamination Reduction Corridor.
j. Protection from environmental conditions should be considered when choosing the location for the Rehab Group.
k. An adequate supply of the following should be maintained in the Rehab Group:
    i. Fluids (if electrolyte solutions, mix 50/50 with water).
    ii. Food (if possible select foods which are easily converted to burnable calories).
    iii. Medical supplies and medical monitoring equipment.
    iv. Shading devices, fans, dry clothing, etc.

l. The following information shall be maintained and recorded for all personnel at the scene who are reassigned for rehabilitation:
    i. Pre-entry medical monitoring information for all entry team members entering the Hot Zone and all decon team members.
    ii. Post-entry medical monitoring information for all entry team members exiting the decon corridor and all decon team members.
    iii. Vital signs for all responders who have been reassigned for the purpose of rehabilitation.
    iv. An accurate record of time in rehabilitation, fluid and food intake, and destination of all personnel exiting rehab will be maintained.
    v. Records of all entries with accurate time in the suit and time on air will be maintained.

m. A minimum of 60 minutes of rehabilitation time should be documented for each 20-minute work mission in level "A" protective equipment.

n. Constant monitoring of entry team members should be done until vital signs have returned to pre-entry levels. Specific attention to weight loss greater than 3.0% of total body weight, elevated core temperature, altered level of consciousness, abnormal EKG tracings, signs and symptoms of exposure to the hazardous materials released, and any other medical or physiological problems deemed appropriate by the Assistant Safety Officer – Hazardous Materials (HMSO) should be treated.

o. All personnel expected to utilize CPC will be medically monitored, as defined elsewhere in the RHMRT SOG's.

p. Pre entry evaluation
    i. Conducted prior to entry in level A or B chemical protective clothing.
    ii. Shall include blood pressure, pulse, respirations, oral temperature (prior to member drinking/eating hot or cold items).
    iii. The following findings shall exclude a member from entry:
        1. Blood pressure greater than 160 systolic or 100 diastolic.
        2. Pulse greater than 120
        3. Respiration's greater than 24
        4. Oral temperature above 100ºF
        5. Recent medical history
        6. Chemical sensitivity
        7. Open skin conditions, or severe sunburn
        8. Use of prescription/non-prescription flu medications
        9. At the discretion of the attending paramedic and upon concurrence of the Assistant Safety Officer - Hazardous Materials (HMSO)
    iv. Members should consume 8-16 oz. of fluid prior to entry.

q. Post Entry Evaluation
    i. Repeat pre entry assessment immediately and after 10 minutes.
    ii. Consume large amounts of fluid (min. 8oz of fluid for each pound of body weight loss. Dilute sport drinks 50% with water).
    iii. Members who experience prolonged elevated vital signs, abnormal EKG, temperature above 100ºF, signs and symptoms of exposure or who, in the opinion of the HMSO,

shall be transported to an appropriate medical facility for observation and appropriate treatment. A toxicological trained paramedic for the purpose of assisting and guiding Hospital personnel shall meet these members at the Hospital.

15. **Demobilization**

a. All incidents that require the stabilization, cleanup, mitigation, or handling of any hazardous substance will require demobilization that include, but may not be limited to: recovery, termination of command, and a debriefing.

b. Recovery

i. Once the threat to the public, the responders, and the environment outside of the emergency site has been eliminated, then and only then should the RHMRT begin the recovery phase.

ii. With respect to the release of RHMRT, recovery should take place as soon as possible after the stabilization or elimination of the situation that brought about the emergency.

iii. Recovery incorporates activities such as:

1. Release of mutual aid and locally supplied units;
2. Replenishment of equipment and supplies; and
3. Considerations given to cleanup operations.

iv. All equipment and supplies used should be accounted for, documented, and placed back in service or listed for cost recovery. Personnel should be included in cost recovery activities. The entry team members must be completely rehabilitated before the team is ready to return to service.

v. Cleanup activities that are required, after the emergency phase of the incident, shall be monitored by the local jurisdiction to insure proper techniques and worker safety is addressed.

c. Termination of Command

i. The IC is responsible for the orderly, safe, and efficient demobilization of resources committed to an incident.

ii. The same standard used for establishing and transferring Incident Command applies to the demobilization and terminating of Incident Command. If two or more units are still on scene, Incident Command should remain in place.

iii. The IC should survey the incident scene to ensure that Incident Command can be terminated safely and effectively.

iv. Incident Command should be terminated when the incident has deescalated to a point where all units have returned to service.

d. Debriefing

i. A debriefing with all on-scene personnel should be accomplished before departure from the scene (whenever possible).

ii. Information that should be gathered during the debriefing includes:

1. Who responded to the incident.
2. What they did.
3. What went right.
4. What went wrong.

5. Who suffered what injuries.
6. What treatments were provided.
7. The accuracy and effectiveness of the Site Safety and Control Plan (ICS 208 HM).

iii. To meet the Hazard Communications requirements of OSHA regulations, and "Right-to-Know" laws,
   1. the following must be documented:
      a. A complete list of all substances encountered.
      b. Symptoms of exposure.
      c. Specific treatments.
      d. Any workers exposed or contaminated.
   2. every responder at the scene must be provided the following:
      a. The names of substances involved.
      b. Exact symptoms of exposure to each substance.
      c. Specific action to be taken for decontamination.

iv. A timeline for the incident should be developed and recorded with the activities of all units at the scene, and any unusual occurrences that took place during the incident.

H. POST INCIDENT GUIDELINES

Incidents that require the stabilization, cleanup, mitigation, or handling of hazardous substance may require post incident guidelines that include, but are not be limited to: post incident analysis, notifications, documentation and cost recovery.

1. **Post Incident Analysis**
    a. As required by 29 CFR 1910.120 (q), all hazardous Materials Incidents requiring the response of 1 or more RHMRT's shall have a Post Incident Analysis (PIA) conducted as soon as possible after the incident.
    b. The purpose of the PIA is to address the activities of the incident in a positive manner, with honest input to help identify the things that worked and those that didn't work. The PIA should examine operations, command, resources, SOG's, the emergency response plan, and training of on scene personnel. All personnel who participated in the response should have input during the PIA. A record of the PIA should be kept and included in the documentation.

2. **Notifications**
    a. Contact the appropriate Point of Contacts for the reasons outlined in Appendix A.

3. **Reportable Quantities**
    a. The County Warning Point shall be contacted in accordance with Palm Beach County Local Amendments to the Florida Fire Prevention Code Chapter 69A-60, Florida Administrative Code (Chapter 69A-60) which includes:
        i. 60.1.1.1 **Liquid**. Above ground storage tanks containing more than 1000 gallons of hazardous materials as defined by this chapter shall be secured in a manner approved by the AHJ based on industry standards or standards of good practice.
        ii. 60.1.1.2 **Solid**. Any solid hazardous materials in excess of 3500 lbs as defined by this chapter shall be secured in a manner approved by the AHJ based on industry standards or standards of good practice.
        iii. 60.1.1.3 **Gas**. Any poisonous gas container in excess of 150 pounds content as defined by this chapter shall be secured in a manner approved by the AHJ based on industry standards or standards of good practice.

4. **Documentation**
    a. WebEOC reporting shall be required by all RHMRT responses to hazardous materials incidents.
    b. After analyzing the information generated during the debriefing and the PIA, the findings should be summarized into a document known as the After Action Report. Recording information about exposures and treatments, in medical records and any other documents must be done in accordance with HIPAA Regulations.
    c. Record any product exposures to equipment and any decontamination procedures or factory recertification information (as appropriate).
    d. Be sure to include in the After Action Report, any recommendations for SOG updates, procedural changes, and training needs identified during the debriefing and PIA; be sure to include a time frame to complete and implement the recommendations.

e. A follow-up should be completed after the time frame for procedural changes has passed to insure that the updates and changes have been accomplished as well as to identify any problems associated with implementing the changes.
f. The tedious and time consuming task of Recovery and Termination is often given a much lower priority than most other incident activities, but must be completed with the idea that accurate incident documentation will be the only way to help recall the incident and learn from it in years to come.
g. The RHMRT will critique all responses of the teams. This critique is to evaluate the response actions of the involved personnel. This critique is in addition to any critique held by the requesting jurisdiction and is not intended to relieve the IC of the need to conduct a critique and subsequent follow-up reports. The RHMRT will document critique outcomes and forward recommendations to the Teams Coordinator. Hazardous Materials Group Supervisors and Coordinators will meet quarterly to review these reports and decide to implement changes to the Response Plan, SOGs, equipment, and training. The Hazardous Materials Group Supervisor and Coordinators will forward the incident reports, follow-up reports, and recommendations to the Oversight Committee for review.
h. All monitoring devices, colormetric tubes and reagents will be maintained as per the manufacturer's recommendations and the authority having jurisdiction's special maintenance guidelines.
i. Inherent safety approvals and inspections will be mandated when applicable.
j. Relative response curves and coefficients as well as cross sensitivity charts will be available to entrants where applicable.
k. A permanent, detailed record or log of the instrument repair and usage history will be kept and will be available to responders.

5. **Cost Recovery**
   a. Cost recovery shall be done in accordance with PBC Ordinance Article VII Sec 11.132

Agreement

As a member of the Fire Chiefs Association of Palm Beach County, each Fire Rescue Department below agrees to adopt this Regional Hazardous Material Response Team SOG, and use the content therein to develop their own Departmental SOGs. Dated this 21st day of November, 2021.

DocuSigned by:
Thomas Wood
85CC75456AA4460...
Boca Raton Fire Rescue

DocuSigned by:
Darrel Donatto
C19B50D7188F425...
Palm Beach Fire Rescue

DocuSigned by:
Jim Stables
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Boynton Beach Fire Rescue

DocuSigned by:
keith Bryer
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Palm Beach Gardens Fire Rescue

DocuSigned by:
L Keith Jomey III
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Delray Beach Fire Rescue

DocuSigned by:
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Palm Beach Shores Fire Rescue

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Brian Fuller
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Greenacres Fire Rescue

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John Curd
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Riviera Beach Fire Rescue

DocuSigned by:
JD Armstrong
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North Palm Beach Fire Rescue

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James Trube
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Tequesta Fire Rescue

DocuSigned by:
Reginald Duren
C21D6E30F50447F...
Palm Beach County Fire Rescue

DocuSigned by:
0536607A936499...
West Palm Beach Fire Rescue

I. **Appendix A** – Contacts

Note, this appendix intentionally left blank for next update

1. Point of Contact Information (people, phone numbers and addresses):
    a. County Warning Point
    b. CST (national guard, civil service team)
    c. Coast Guard
    d. FBI
    e. Class 3 wreckers
    f. ATF
    g. DEP
    h. DOH - Lisa Vreeland @DoH
    i. DOT
    j. WEBeoc
    k. Solid Waste Authority
    l. Turnpike Enterprises
    m. MCI events
        i. tbd
    n. Gas Leaks
        i. TECO
        ii. Peoples Gas
        iii. Florida Public Utilities

J. **Appendix B** – Hazmat Detection Equipment

Hazmat Detection Equipment - last update 05/2021

Chemical Identification Monitors	PBCFR	DBFD	BRFD	WPBFD
HazmatID Elite (FT-IR)			X	X
MX908	X			
Raman/FTIR - Gemini Analyer	X			
Raman - First Defender		X		X
Raman - Rigaku Progeny RESQ			X	
Torion T-9 – GC/MS			X	
Air/Gas/PID/FID Monitors	**PBCFR**	**DBFD**	**BRFD**	**WPBFD**
Drager Xam 2500 4 gas	X			
Drager Xam 2500 5 gas	X			
MultiRAE Lite (10.6 eV)				X
MultiRAE Pro5 (10.6 eV)		X		
Ventis MX-4 4 gas		X		
IBRID MX6				X
MiniRAE 3000 (10.6 eV)	X		X	X
ToxiRAE Pro (HCN)				X
ToxiRAE Pro (NO2)				X
QRAE 3				X
Sensit Gold (Natural Gas - Methane)			X	X
Bacharach Leakator 10 (CGD)		X		
Tango TX-1 (CD)		X		
Haz-Dust HD-1100				X
TVA2020 FID			X	X
Drager 7000 HCN	X		X	
GAS ID (FT-IR Gas/Vapor ID)		X		
Zeeman Mercury Spectrometer	X			
TVA 10000-B	X			
MSA Altair 4X (4 gas)		X	X	
MSA Altair 5X (4 gas w/HCN)		X	X	
MSA Altair 5X (PID)			X	
MSA Altair 2X (Ammonia)			X	
Chemical Agent Detectors CWA/TICs	**PBCFR**	**DBFD**	**BRFD**	**WPBFD**
LCD 3.3	X	X		X
GAS ID (FT-IR Gas/Vapor ID)		X		
M256 Kit	X		X	X
M8 Paper	X		X	X
M9 Tape	X		X	X
Explosives	**PBCFR**	**DBFD**	**BRFD**	**WPBFD**
DropEX Kit				X

Biological Test Kits	PBCFR	DBFD	BRFD	WPBFD
BioCheck 20/20 Kit	X	X	X	X
Razor Ex			X	
Alexeter RAID 8	X	X		
Alexeter RAID 10				X
Alexeter Guardian BTA Reader/Strips		X		
Radiation Detection/Measurement	**PBCFR**	**DBFD**	**BRFD**	**WPBFD**
FLIR IdentiFINDER 2	X			
FLIR IdentiFINDER R400				X
RadEye SPRD-GN (Gamma ID)				X
Ludlum Model 26	X			X
RadEye G	X	X	X	X
RadEye GF	X			X
RadEye G4		X		
CDV 700 (Ludlum Model 44-9)	X	X	X	X
CDV 715 Dosimeters	X	X		X
CDV 750 Dosimeters		X		
Canberra (Ultra Radiac Plus)	X	X		X
RadAlert 50				X
FH40 GL	X			
Mirion DMC 3000			X	
Thermo RIIDEye			X	
Detection Paper	**PBCFR**	**DBFD**	**BRFD**	**WPBFD**
pH paper	X	X	X	X
H2O		X		X
Spil-Fyter Strips	X		X	
KI paper (Potassium Iodide)	X	X	X	X
F paper (Fluoride)	X	X	X	X
Peroxide Strips		X	X	
Refrigerant Leak Detectors	**PBCFR**	**DBFD**	**BRFD**	**WPBFD**
UEi RLD 15B	X			
TIF XP-1A				X
UEi RLD 10				X
Inficon D-Tek – Refrigerant detector			X	
Unknown Chemicals	**PBCFR**	**DBFD**	**BRFD**	**WPBFD**
Drager Automatic Pump (1)	X	X	X	X
Drager Manual Pump (x2)	X	X	X	X

K. **Appendix C** – Boca Raton

Boca Raton Fire Rescue Special Operations Division

Division Chief of Special Operations – Mike Altamuro maltamuro@myboca.us

- Cell 561-926-3132

On-Duty Battalion Chief – Battalion 1

- Cell 561-239-7483

BRFR Station 6

- 1901 Clint Moore Rd.
- 561-544-8556
- Engine 6 (3 HM Techs), HazMat 6 (1 HM Tech), Medic 6 (3 HM Techs)

L. **Appendix D** – Delray Beach

Delray Beach Fire Rescue Special Operations

District Chief – James Bradford bradford@mydelraybeach.com

- Cell 561-253-5247

Special Operations Coordinator (Haz-Mat, TRT, Dive) – Craig Mahoney mahoney@mydelraybeach.com

- Cell 561-644-8030

On-Duty Battalion Chief

Cell 561-441-3083

DBFR Station 115

- Station #115 Special Operations
- 561-243-7485
- 4000 Old Germantown Road, Delray Beach FL, 33445
- SO115- 1 PAX, Truck115- 3 PAX, Rescue115- 3 PAX

M. **Appendix E** – Palm Beach County

Palm Beach County Fire Rescue Special Operations Hazmat & TRT Battalion 9

District Chief - Bob Kropa
BKropa@pbcgov.org

- Cell 561-315-9040

Special Operations & Specialty Training Coordinator – Patrick Burroughs
Pburroughs@pbcgov.org

- Cell 561-644-2798

Special Operations & Technical Rescue Coordinator – Greg Tabeek
Gtabeek@pbcgov.org

- Cell 561- 267-6925

On-Duty Battalion Chief BC34

- Cell 561-308-4136

PBCFR Station 34

- Station #34 Special Operations HQ
- 561-790-6051
- 231 S. Benoist Farms Rd., WPB 33411 790-6052
- SO34- 2 PAX, Squad34- 3 PAX, Rescue34- 3 PAX, BC34- 1 PAX, EMS34- 1 PAX

PBCFR Station 19

- 561-748-4730
- 322 N. Central Blvd., Jupiter 33458
- SO19- 2 PAX, Squad19- 3 PAX, Rescue19- 3 PAX

N. **Appendix F** – West Palm Beach

West Palm Beach Fire Department Haz Mat Team, Station #2

Assistant Chief of Emergency Management/Special Ops- Brent Bloomfield BBloomfield@wpb.org

- Cell 561-284-3862

Haz Mat Station Captains –

- 1st Platoon, Brain Walker, BWalker@wpb.org
  - Cell 561-239-2006
- 2nd Platoon, Scott Cabrera, SCabrera@wpb.org
  - Cell 561-315-4049
- 3rd Platoon, Doug Greene, DGreene@wpb.org
  - Cell 561-644-1374

WPBFD Station 2

- Station #2 Haz Mat Team
- 561-804-4820
- 4301 S. Dixie Hwy, West Palm Beach, Fl, 33405
- E2- 3 PAX, Rescue2- 3 PAX, HM2- 1 PAX

O. **Appendix G** – NIMS Incident Complexities and Typing

NIMS Incident Complexity Guide

5. Incident Effect Indicators Summary Table

This table supports the Incident Effect Indicators listed in the above Incident Complexity Level Tables across all hazards and provides a basis for training to determine incident complexity. Users can identify indicators with ease of use in addition to the detail provided above.

Incident Complexity Level: Incident Effect Indicators Summary										
Type	Resistance to stabilization or mitigation	How long does it take for resources to meet incident objectives?	Effects on population immediately surrounding the incident	Length of incident effects	Evacuations necessary during mitigation	Adverse impact on CIKR	CIKR impact / mitigation measures	Coordination required with elected/ governing officials and stakeholder groups	Do conditions or actions that caused original incident persist?	Probability of cascading event or exacerbation of current incident
5	None	1-2 hours	Minimal	Minimal	Few or none	None	None	Minimal or none	No	None
4	Low	Several to 24 hours	Limited	Up to 24 hours	Few or none	Minimal	Uncomplicated within one operational period	Minimal or none	No	Low to none
3	Moderate	At least 24 hours	Moderate	Several days to over one week	Possible; may require shelter	Threatens, damages, or destroys property	Adverse; multiple operational periods	Some	Possibly	Medium
2	High	Several days	Significant	Several days to two weeks	Possible; may require shelter/ housing for several days to months	Threatens, damages, or destroys property	Destructive; requires coordination over multiple operational periods	Moderate, including political organizations	Possibly	High
1	High	Numerous operational periods	Significant	Two weeks to over a month	May require shelter/ housing for several days to months	Significantly threatens, damages, or destroys property	Highly destructive; requires long-term planning and extensive coordination over multiple operational periods	High, including political organizations	Yes	High

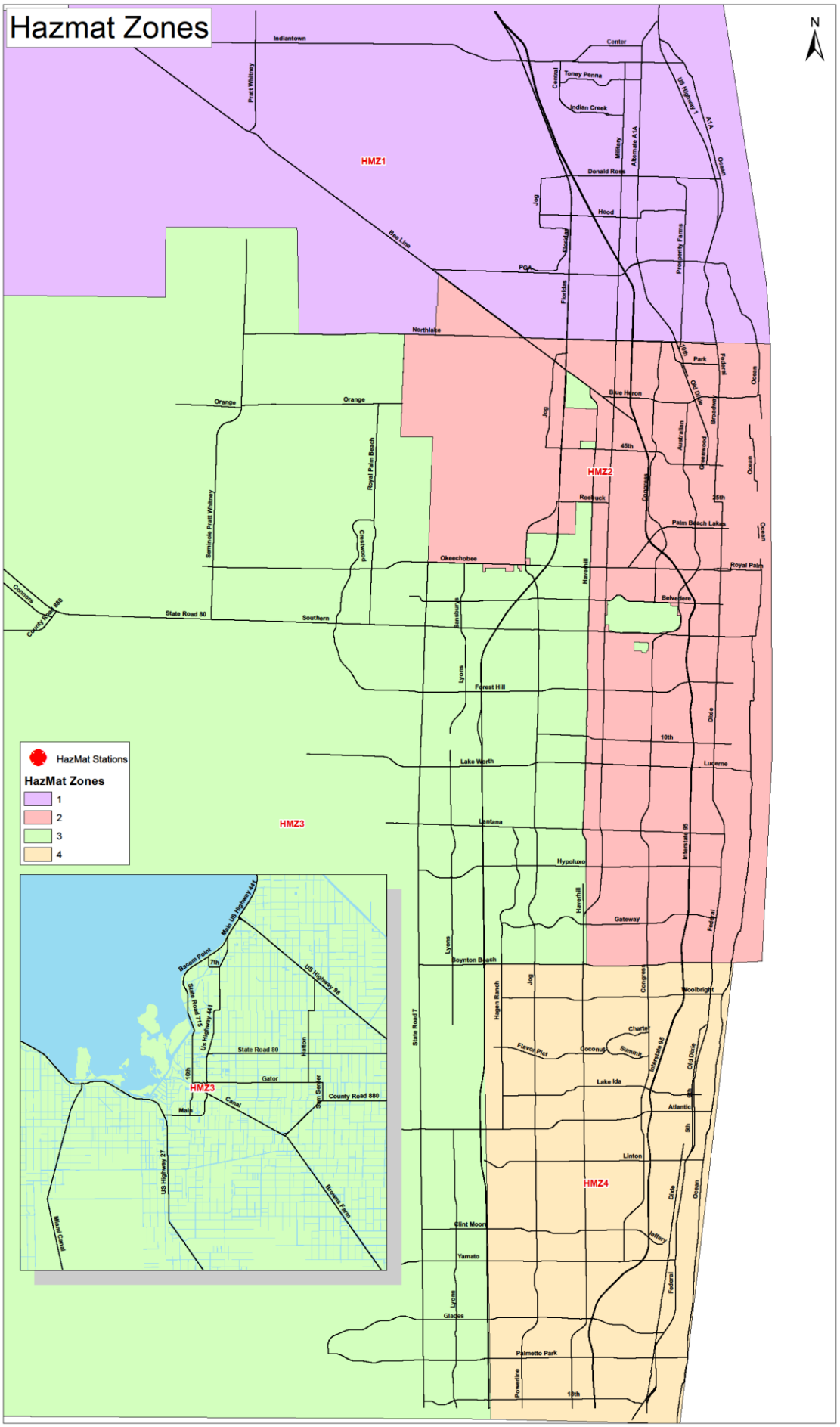
P. **Appendix H –** Response Zones

Zone 1	**Northern Boundary:**	Martin County / Palm Beach County line.
	Southern Boundary:	North Lake Blvd east of State Rd.7, inclusive of Northlake Blvd.
	Eastern Boundary:	Atlantic Ocean
	Western Boundary:	Palm Beach County Line
	1st Due:	Palm Beach County Special Operations 19
	2nd Due:	West Palm Beach HazMat 2
	3rd Due:	Palm Beach County Special Operations 34
	4th Due:	Boca Raton HazMat 6, Delray Beach Special Ops 115

Zone 2	**Northern Boundary:**	Northlake Blvd, exclusive of Northlake Blvd.
	Southern Boundary:	Okeechobee Blvd (East of State Rd.7) Boynton Beach Blvd (East of Haverhill)
	Eastern Boundary:	Atlantic Ocean.
	Western Boundary:	State Rd.7, exclusive of State Rd.7 (North of Okeechobee Blvd) Haverhill, exclusive of Haverhill (North of Boynton Beach Blvd)
	1st Due:	West Palm Beach HazMat 2
	2nd Due:	Palm Beach County Special Operations 19
	3rd Due:	Palm Beach County Special Operations 34
	4th Due:	Boca Raton HazMat 6, Delray Beach Special Ops 115

Zone 3	**Northern Boundary:**	Northlake Blvd (West of 120th Ave N, East of Grape View Blvd) Halpatiokee Rd and Stumpers Grade Rd (West of Grape View Blvd) Okeechobee Rd (West of Haverhill, East of State Rd.7)
	Southern Boundary:	Boynton Beach Blvd, exclusive of Boynton Beach Blvd. Broward County / Palm Beach County line
	Eastern Boundary:	State Rd.7 (North of Okeechobee Blvd) Haverhill Blvd (South of Okeechobee Blvd, North of Boynton Beach Blvd) Turnpike, inclusive of the turnpike (South of Boynton Beach Blvd).
	Western Boundary:	Palm Beach County Line
	1st Due:	Palm Beach County Special Operations 34
	2nd Due:	Boca Raton HazMat 6, Delray Beach Special Ops 115
	3rd Due:	West Palm Beach HazMat 2
	4th Due:	Palm Beach County Special Operations 19

Zone 4	**Northern Boundary:**	Boynton Beach Blvd, inclusive of Boynton Beach Blvd.
	Southern Boundary:	Broward County / Palm Beach County line
	Eastern Boundary:	Atlantic Ocean
	Western Boundary:	Turnpike, exclusive of the turnpike.
	1st Due:	Boca Raton HazMat 6, Delray Beach Special Ops 115
	2nd Due:	Palm Beach County Special Operations 34
	3rd Due:	West Palm Beach HazMat 2
	4th Due:	Palm Beach County Special Operations 19



Q. **Appendix I** - Hospital Capabilities

Medical Facility	Chemical	Biological	Radioactive	Adult Trauma/Medical		Pediatric Trauma/Medical	
Bethesda Hospital East	Yes	Yes	Yes	No	Yes	No	Yes
Bethesda Hospital West	Yes	Yes	Yes	No	Yes	No	Yes
Boca Raton Regional Hospital	Yes	Yes	Yes	No	Yes	No	Yes
Delray Medical Center	Yes	Yes	Yes	Yes	Yes	Yes	No
Good Samaritan	Yes	Yes	Yes	No	Yes	No	No
JFK Medical Center	Yes	Yes	Yes	No	Yes	No	No
JFK ESD at Palm Beach Gardens (JFK North)	Yes	Yes	Yes	No	Yes	No	No
JFK ESD at West Boynton (JFK South)	Yes	Yes	Yes	No	Yes	No	No
Jupiter Medical Center	No	No	No	No	Yes	No	No
Lakeside Medical Center	No	No	No	No	Yes	No	Yes
Palm Beach Gardens	Yes	Yes	Yes	No	Yes	No	No
Palms West	Yes	Yes	Yes	No	Yes	No	Yes
St. Mary's Medical Center	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Veterans Administration	Yes	Yes	Yes	No	Yes	No	No
Wellington Regional	Yes	Yes	Yes	No	Yes	No	Yes
West Boca Medical Center	Yes	Yes	Yes	No	Yes	No	Yes
West Palm Hospital	Yes	Yes	Yes	No	Yes	No	No

R. **Appendix J** - Radiation

1. Required Notifications
    a. CWP: County Warning Point at the County Emergency Operations Center (EOC)
        i. Telephone: 561-712-6428
        ii. Radio: PBC radio system EM CALL
    b. DEM: Palm Beach County Division of Emergency Management
        i. Duty Officer: 561-644-8527
    c. SWO: Florida State Watch Office at the State Emergency Operations Center
        i. Telephone: 850-413-9911
        ii. Radio: State Law Enforcement Radio System:
    d. BRC: Florida Bureau of Radiation Control
        i. 24/7 Duty Officer: 407-297-2095
    e. The CWP shall be notified of calls for service involving ionizing radiation regardless whether or not protective actions for the general public were/are implemented
        i. One notification to the CWP will accomplish the required notifications to DEM, SWO & BRC
        ii. FL Fusion Network is notified via SWO
2. Dispatch & Mobilization
    a. Codes:
        i. No actual dispatch CAD code exists for radiological call for service or emergency
        ii. Hazardous Material Investigation is the dispatch CAD code utilized
    b. Mobilization:
        i. Except for law enforcement investigations, specialty teams and additional resources for a radiation emergency shall be requested through the EOC
3. Authority, Jurisdiction & References
    a. Florida is an Nuclear Regulatory Commission (NRC) Agreement State
        i. By FL Statute §404 and FL Administrative Code 64-E, the FL BRC is statutorily the lead agency for all matters involving ionizing radiation and LASERs
    b. PBC Comprehensive Emergency Management Plan stipulates that the PBC DEM is the lead agency for radiation emergencies in PBC
        i. Protective actions for the general public from a radiological emergency are apt to involve a local state of emergency
    c. Official first responder job aids & field references shall be utilized to the greatest extent practicable – See attachments
4. Roles & Responsibilities of RHMRT Technicians during Radiological Emergencies
    a. Nuclear Power Plant (NPP)
        i. Consequence Management
            1. Radiological Emergency Reception Center (RERC) operations

a. Monitoring & Decontamination stations 4M & 4D
b. SOP: PBC DEM RERC Field Operations Guide (FOG)

2. Technical specialist support for monitoring & decontamination checkpoints & critical facilities, e.g. EOC, courthouse, etc.

ii. Crisis Management

1. Technical specialist support for local, state, federal field monitoring strike teams
2. Technical specialist support for force protection

b. Radiological Dispersal Device (RDD)

i. Consequence Management

1. Radiological Emergency Reception Center (RERC) operations
   a. Monitoring & Decontamination stations 4M & 4D
   b. SOP: PBC DEM RERC Field Operations Guide (FOG)
2. Technical specialist support for monitoring & decontamination checkpoints & critical facilities, e.g. EOC, courthouse, etc.

ii. Crisis Management

1. Technical specialist support for force protection
2. Conducting / Assisting with 10 Point Field Monitoring Operations

c. Improvised Nuclear Device Explosion (IND)

i. Consequence Management

1. Radiological Emergency Reception Center (RERC) operations
   a. Monitoring & Decontamination stations 4M & 4D
   b. SOP: PBC DEM RERC Field Operations Guide (FOG)
2. Technical specialist support for monitoring & decontamination checkpoints, critical facilities, e.g. EOC, courthouse, gov't center, etc.

ii. Crisis Management

1. Technical specialist support for force protection particularly search & rescue in light & moderate damage zones
2. Conducting 10 Point Field Monitoring Operations
3. Technical specialist support for force protection

d. Contamination Incident / Radiological Exposure Device (RED)

i. Consequence Management

1. Radiological Emergency Reception Center (RERC) operations
   a. Monitoring & Decontamination stations 4M & 4D
   b. SOP: PBC DEM RERC Field Operations Guide (FOG)

ii. Crisis Management

1. Detection, Search & Mitigation Operations with law enforcement
2. Technical specialist support for force protection

5. Subject Matter Experts/Specialists

a. SMEs/Specialists who's profession is radiation protection and/or radiological emergency management includes, but is not limited to the following:

b. CST (Civil Support Team of Army National Guard)
    i. Recognized experts in offensive measures involving Weapons of Mass Destruction (WMD)
    ii. Member of Armed Services
c. CHP (Certified Health Physicist)
    i. Recognized experts in medical treatment of radioactive contamination
    ii. Occupational radiation worker
d. NRRPT (National Registry of Radiation Protection Technologist)
    i. Qualified to implement radiation protection practices
    ii. Occupational radiation worker
e. RCT (Radiation Control Technician)
    i. Member of state/federal health physics agency or licensee
    ii. Occupational radiation worker
f. REP (Radiological Emergency Preparedness personnel)
    i. State-Local-Tribal-Territorial & federal specialists in NPP emergencies
    ii. Not an occupational radiation worker
g. ROSS (Radiological Operations Support Specialist)
    i. Nationally recognized & federally supported specialists in managing large-scale radiological-nuclear emergencies
    ii. May or may not be an occupational radiation worker

6. Instrumentation
    a. Detector Technologies
        i. Technicians shall be trained and proficient with the use of various detector technologies utilized in hand-held and other instruments
            1. Scintillator detectors
                a. Typically used in prevent mission operations while searching for gamma/X-ray radiation due to their high degree of sensitivity
            2. Geiger-Mueller detectors
                a. Typically used in response operations involving contamination as well as gamma radiation
                b. Are less sensitive & require longer “lag” time for detection
                c. Typically have broader dynamic range
                d. Less apt to be overloaded
                e. All PBC DEM Radiation Survey Kits utilize GM detectors
                    i. See the attachment
    b. Instrument Calibration
        i. All radiation detection instruments shall be calibrated
        ii. The frequency for calibration is typically one (1) year
        iii. The calibration sticker shall be prominently displayed on the instrument
        iv. The PBC DEM manages all re-calibrations of response instruments
        v. The FL BRC is the primary re-calibration laboratory for response instruments

1. A NIST-Traceable process is utilized with Cs137 as the calibrated check-source

vi. Out-of-calibration instruments that meet an operational check may be utilized in a radiological emergency

c. Instrument Usage & Protection

i. A pre-operations check shall be performed prior to using radiation instruments

ii. Prior to use, Technicians shall:

1. Check the instrument for obvious signs of damage
2. Place and out-of-service tag on faulty instruments with an explanation of the fault & notify supervision for a replacement
3. Insert batteries following the indicated polarity sequence
4. Power-up the instrument only in an area of natural background radiation
5. Clear the accumulated dose in gamma dose-rate survey meters
6. Remove batteries from instruments that are not in active use
    a. NOTE: Battery acid leakage is the #1 cause of instrument failure
    b. See the attachment

iii. Technicians shall protect instruments from damage, take responsibility for mishaps, and promptly report incidents to command

d. Trained Technicians Shall Become Familiar with Radiation Detection Assets

i. The Palm Beach County Sheriff's Office (PBSO), Florida Highway Patrol (FHP), and Florida Wildlife Conservation Commission (FWC) among other agencies use sophisticated detection capabilities while conducting prevent mission operations, including but not limited to the following:

1. Large scintillators in backpacks, offshore marine enforcement vessels, fixed & rotary wing aircraft
2. Neutron detection in various platforms

ii. The FL BRC & federal agencies have loaner equipment packages available for surge operations during special events and for emergency response operations – Contact DEM/REP for details

iii. Preventative Radiological Nuclear Detection (PRND) mission assets & capabilities shall be used during emergency response operations
    1. Check with DEM/EOC regarding the most appropriate applications for PRND instruments given the particular situation & approved mission number

7. Force Protection

a. Technicians shall possess the requisite knowledge, skills, and abilities for they operations they perform (OSHA 1910.120)
b. Classification of Emergency Workforce
    i. By NRC definition, first responders are classified as emergency workers and are subject to the same protective action guidelines as the general public
        1. Exposure to radiation for emergency response is considered to be once in a lifetime event subject to the US EPA PAGs for exposure
    ii. By NRC definition, occupational radiation workers are subject to strict dose limits of 5 REM per year among other requirements
c. Implementing ALARA Principle
    i. Technicians shall be proficient with and practice the ALARA Principle while training for and mitigating the harmful effects of ionizing radiation during emergency response & related activities
        1. Receiving a dose of radiation must be for a specific purpose and clearly defined benefit which outweighs the risk of the harmful effects of radiation
            a. Emergency workers receiving a dose of radiation shall be in direct support of a specific task of a documented emergency response mission or defined training activity
        2. Radiation doses for emergency response activities must be measured and documented in accordance with agency policies and procedures
d. Protective Action Guidance (PAGs) for Radiation Emergency
    i. Technicians and commanders shall consult an SME or specialist for explanations and context based on US EPA PAG manual

5-25µr/HR exposure rate 15-50 cpm	NATURAL BACKGROUND READINGS IN SOUTH FLORIDA
2X BACKGROUND (cpm)	Contamination threshold
300-1,000 cpm	Contamination value NPP emergency only Check w/ Command
100µr/HR exposure rate	Action Level For Alarm Response Guide Low alarm setting on RadEye G/GF
2mr/HR exposure rate	Hot Zone Boundary High alarm setting on RadEye G/GF
5R/HR exposure rate	Turn Back Now – FL BRC SOP #14

5R cumulative dose	Maximum Dose for Emergency Response Activities
10R cumulative dose	Maximum Dose for Critical Infrastructure Protection
25R cumulative dose	Maximum Dose for Live Safety Actions with Informed Consent
100R cumulative dose	Onset of Acute Radiation Syndrome

e. Personal Protective Equipment (PPE)
   i. Minimum Requirements
      1. Level D – Everyday duty clothing plus:
         a. Gloves, Eye Protection, & N95 mask
      2. Higher level respiratory protection may be required

f. Dosimetry
   i. TLDs/OSLDs
      1. Description, Storage, Replacement, Ownership:
         a. 200 Landauer brand Luxel® OSLDs are maintained at the PBC EOC room #166 along with the appropriate clips/holders
         b. Each OSLD has an individual serial number & barcode
         c. The lot is assigned to Palm Beach County DEM as part of the REP program
         d. The BRC owns & maintains the account with Landauer
         e. The cache is replaced annually in JUL/AUG
   ii. DRDs
      1. Description, Storage, Replacement, Ownership:
         a. Tens of thousands of Civil Defense (CDV) ion chamber, Direct Reading Dosimeters were distributed to local authorities during the cold war – Many remain in use & available in PBC via the PBC DEM REP program
         b. The CDV742 (0-200R) models have been collected & stored due to their very high range & deteriorating condition
         c. The CDV138/838 (0-200mR) models have been collected but are available for use in an emergency deployment kits of 40 each:
            i. The kits includes chargers, pouches, and exposure cards
            ii. The kits are stored at the PBC Purchasing Warehouse
               1. 2455 Vista Parkway, West Palm Beach
            iii. Contact PBC DEM or the CWP for deployment
         d. The caches of DRDs are owned by the State of Florida & assigned to Palm Beach County via the REP program
         e. Ion chamber DRDs:
            i. Must be electrically charged and leak tested quarterly in order to maintain their effectiveness

ii. Are sensitive to shock/impact which may compromise their effectiveness
iii. Do not alarm & require personal attention
iv. Requires the use of a note card to tabulate cumulative dose over time: 30 or 60 minutes

iii. Team or Area Dose Rate Monitoring & Technical Assistance

1. Technicians shall be familiar with the role, responsibilities, and mobilization of the PBC DEM Team Radiation Safety Specialists (RSS):
    a. Monitor gamma dose rate and dose for a small team (~10) or defined area (20ftX20ft max)
        i. One (1) RSS per team or defined area
    b. Assist with instrumentation issues
    c. Assist with the implementing ALARA practices
    d. Be the safety resource for radiation at the unit level
    e. Communicate radiological terminology with SMEs/specialists
2. Technicians shall know that RSS deployment is via the EOC
    a. 1st call is to the CWP: 561-712-6428

iv. Use of Dosimetry:

1. Use of dosimetry follows PBC DEM SOG OP052 – *Implementation of Radiation Exposure Control for Emergency Workers*
    a. Policy: ***Emergency Workers Shall Use Dosimetry During Radiation Emergencies***
        i. TLDs/OSLDs shall be reserved for use during SEVERE & MAJOR emergencies only
            1. TLDs/OSLDs shall be issued to individual emergency workers
            2. TLDs/OSLDs shall be issued by serial numbers and individual emergency workers' identification
            3. Accurate records shall be maintained by an acting radiation officer or RSS or equivalent under the supervision of the incident SOFR
            4. TLDs/OSLDs shall not be swapped, exchanged, or traded
            5. TLDs/OSLDs shall be worn on the outside of the emergency workers' PPE between the waistline and shoulders
            6. TLDs/OSLDs shall be collected by the acting radiation officer or RSS or equivalent prior to demobilization

7. Used / deployed TLDs/OSLDs shall be safeguarded in an area of low background radiation until which time they can be turned over to the BRC for processing
8. All pertinent records / documentation supporting the use / deployment of the TLDs/OSLDs shall be submitted to the BRC along with the TLDs/OSLDs

ii. For all radiation emergencies Technicians shall use gamma dose rate survey meters from the on-set of the emergency, e.g. RadEye G/GF/PRD or Radiac
1. The accumulated dose shall be cleared prior to commencing operations
2. The device shall be worn on the outside of the Technician's PPE
3. At minimum, the RHMRT's acting safety officer shall record pertinent information for later review:
a. Device by serial number
b. Time issued
c. Time returned
d. Issued to whom
e. Description of activities
f. Natural background radiation levels at command post or location of issuance

b. Dose limits and decision points and limits shall follow FL BRC SOPs & US EPA PAGs for emergency workers

g. Potassium Iodide (KI)

i. Technicians shall have working knowledge of KI for use in a NPP emergency:
1. Not an antidote for radiation sickness/syndrome
2. Is effective only against radioactive Iodine
3. Should be taken only under medical supervision
4. Must be authorized by DOH Operations Officer
5. Requires medical consent waiver
6. Has potentially lethal side effects for those who are allergic
7. Is available in 65mg pills
8. 400,000+ 65mg doses are immediately available in PBC
a. This cache is maintained by PBC DOH for use during NPP emergency as instructed by the FL BRC

ii. With the advice of their personal physician, Technicians shall pre-determine for themselves whether taking KI during a NPP emergency when the DOH

Operations Officer recommends ingestion for contaminated personnel is medically appropriate

iii. Technicians shall be familiar with KI dosages which are administered by DOH
   1. Adults 18+: 130mg
   2. Adolescents 12-18: 65mg
   3. Children 1-3: 32mg
   4. Infants : Consult Physician

h. ICS208-R Form

i. Pre-Incident RADIOLOGICAL Safety Briefing
   1. Prepared by DEM/REP
   2. Covers ALARA, force protection, background readings, & required actions – See attachment

ii. Command / Safety Officer (SOFR) / Radiation Safety Officer (RSS)
   1. Qualified personnel shall read the ICS208-R
   2. ONLY qualified personnel shall interpret or answer questions regarding implementation of the ICS208-R

8. Units of Measurement & Radiation Readings

Units	English	International
Radioactivity	Currie (Ci)	Becquerel (Bq)
Exposure	Roentgen (R)	Coulomb/Kilogram (C/Kg)
Absorbed Dose	RAD	Gray (Gy)
Dose Equivalent	Roentgen Equivalent Man (REM)	Sievert (Sv)

a. Technicians shall report/record radiation readings in English units of measure
b. Converting to-from International units shall be made with an approved application and used where appropriate
c. Technicians shall consider the Alarm Response Guide (ARG) for all radiation readings
   i. Detect, Verify, Locate, Measure, Assess
d. Technicians shall consider the influence of distance, shielding & background among other factors when reporting/recording radiation readings
e. Technicians shall be deliberate in communicating radiation readings
   i. Do not confuse milli (m) & micro (μ) & repeat digital readings verbatim from the instrument
   ii. Use phonetics to differentiate two most commonly confused prefixes:
      1. milli (m)(10^{-3}) vs. micro (μ)(10^{-6})
      2. milli-R pronounced as “m-R”
      3. micro-R pronounced as “you-R

9. Data Management

a. Use of Scribes to Record Radiological Data
    i. Technicians shall use scribes and/or other means of recording data to document & characterize the response to a radiation emergency
    ii. For radiation incidents of minor & moderate severity, maintaining data on a spreadsheet or by other electronic means is acceptable
b. The Use of Personally Owned Devices for Logging Radiological Data is Prohibited
c. Use of RadResponder/CBRNResponder
    i. For radiation incidents of severe or major severity, RadResponder / CBRNResponder shall be used to document radiological data
    ii. This section shall not conflict with existing agency SOPs for the use of RadResponder/CBRNResponder
    iii. At minimum, Technicians shall:
        1. Know their agency's administrator & alternate for RadResponder / CBRNResponder & be able to contact that individual during an emergency
        2. Be capable of creating a new event
        3. Be capable of serving as:
            a. Data Viewer
            b. Data Collector
            c. Data Assessor
            d. Team Manager

10. Survey Techniques

a. Warnings & Precautions to Technicians
    i. Suspicious Package Protocols Prevail – Follow All Agency SOPs for Unknown Packages and/or Situations – Proceed Only When Safe to Do So
    ii. A stable & controlled environment is required to perform radiological surveys
b. Technicians shall survey (or frisk) the object of the investigation, e.g. people, packages, vehicles, & facilities, for gamma radiation first before taking other actions
c. Technicians shall use proper techniques regarding proximity & rate when using handheld devices to conduct a survey:
    i. One (1) to three (3) inches above surface vertically
    ii. One (1) to three (3) inches linear movement across surface
        1. A methodical pattern is required
            a. Grid
            b. Serpentine
            c. Circular
d. Radiological Surveys of People:
    i. Technicians shall follow the "Green Man Reference Diagram" when surveying people – See attachment
        1. Priority areas are as follows:

a. Face
b. Hands
c. Feet/shoes
d. Torso/abdomen
e. Extremities

2. Aids for balance shall be provided to the victim, e.g. chair, stool, etc.
3. The front & back (anterior – posterior) of the victim shall be surveyed

ii. Notations on Anatomical Diagrams
1. Scribes shall note on the anatomical diagram the location & reading(s) detected on the victim, for both the initial survey & post-decon re-survey
2. DISCRETION SHALL BE MAINTAINED when communicating readings audibly between surveyor(s) and the scribe
a. NOTE: HIPPA regulations may prevail in some circumstances

iii. Anatomical Diagrams Shall Accompany Victims Between Stations
1. Large scale, multi-station operations will require strict means of tracking & accountability of anatomical diagram forms
2. Check with Command regarding the distribution of copies & the placement of barcoded stickers (where applicable)

iv. Green Wrist Bands Shall Be Used During NPP RERC Operations
1. See RERC FOG for details
2. Green color = INVOLVED
3. Mark the "RADIATION" bubble on line #2 for contaminated victims

v. Use of Triage Tags
1. Follow agency SOP

e. Packages
i. Suspicious Package Protocols Prevail – Follow All Agency SOPs for Unknown Packages and/or Situations – Proceed Only When Safe to Do So
ii. A stable & controlled environment is required to perform radiological surveys
iii. Survey & mark all six (6) sides of the package when it practical to do so
1. Devise an on-scene solution for dealing with drums, cylinders, etc

f. Vehicles
i. Beware of the Inherent Dangers of Traffic
ii. Consider vehicle & engine components & materials as shielding
iii. RERC Operations During NPP Emergency
1. Survey the following priority areas of the vehicle:
a. Exterior
i. Door handles, levers, knobs, etc.
ii. Air-intake grilles, screens, etc.
iii. Wheel wells
b. Interior

i. High-touch surfaces
    1. Radio
    2. Climate & lighting control knobs
    3. Levers, stick-shift
    4. Steering wheel
    5. Foot pedals/floor matts

g. Facilities
    i. Ceilings, floors, walls
    ii. Behind, underneath, & above furniture
    iii. NOTE: gamma radiation will easily penetrate construction materials of multi-floor commercial buildings – A reading on one floor may actually be sourced on a different floor

h. Animals
    i. CAUTION: Technicians shall beware of & take precautions against fractiousness when conducting radiation surveys of animals
        1. Request the assistance of the PBC Division of Animal Care & Control (ACC)
    ii. Passive survey techniques are necessary, e.g. placing fixed instruments along the sides and underneath tables, within safety cones, etc. then leading the animal along or past the point of detection
        1. PBC ACC has Veterinarians & specialists qualified for this type of work
        2. Consider the fact that the RERC FOG for NPP emergency stipulates that the animal owner / handler be primarily responsible for the animal
    iii. A lower standard of care may be used for animals during SEVERE & MAJOR radiological emergencies – Check with Command

11. Air Monitoring

a. If a case of radiological contamination in breathable air is suspected, Technicians shall implement immediate emergency protective actions, then notify the CWP for the appropriate alert & notification as well as the FL BRC for emergency response
b. Scenarios include, but are not limited to the following:
    i. Plume from a release
    ii. Resuspension of settled or deposited contamination

12. Decontamination Operations

a. Rationale
    i. Minimize waste and contaminated by-products, tools, equipment, etc. as all of it will have to be monitored, transported, & disposed of in a repository
b. Methodologies
    i. For emergency response purposes DRY-SPOT decon techniques are preferred, options include, but are not limited to the following:
        1. Remove contaminated articles of clothing following agency SOP for privacy, vanity, decency, etc.

2. Technical decon by adhesion, vacuuming, or electrostatic charge
    a. Lint-roller, tape, etc.
    b. Wipes
    c. HEPA filtration
    d. Polyester fabrics attract certain radionuclides

ii. Gross-wet techniques may be necessary during SEVERE & MAJOR emergencies with mass casualties – Follow existing agency SOPs

c. Supplemental care
    i. If supplemental or follow-up decon for victims is warranted provisions for victims shall be made including, but not limited to the following:
        1. Providing prompt access to showers
        2. Providing reasonable accommodations & assistance
        3. Providing simple instructions
        4. Providing downstream support
    ii. Contact DEM / EOC for planning, resources, transportation, security, hydration, & other mass care priorities
d. Post-Decon Radiological Survey
    i. Follow procedures outlined in *Radiological Surveys of People* of this SOP
    ii. Check with Command regarding the policies & procedures for document handling, retention, & distribution
        1. When applicable, victims shall receive a legible copy of their anatomical diagram form
        2. During RERC operations in a NPP emergency, victims' green wristband shall remain with the victim

13. Considerations for Prevent Mission Operations

a. Prevent missions conducted by law enforcement involve custodial arrest of suspects, rules of criminal procedure, civil rights & trials of the accused based on evidence presented in courts of law – Technicians shall have the requisite training & certifications which qualifies them to participate in the on-scene investigation
    i. Extra consideration shall be given to preventing Fourth Amendment violations
b. Instruments shall be calibrated & display a current sticker from a calibration laboratory using the NIST-Traceable standard
c. Primary Screener Alarm Response Guide Actions:
    i. Detect, Verify, Locate, Measure, Assess, and Adjudicate
d. Secondary Screener Alarm Response Guide Actions:
    i. Detect, Verify, Locate, Measure, Assess, Identify, and Adjudicate
e. Resources for Technical Assistance & Reachback
    i. DEM
    ii. FHP/FWC
    iii. BRC
    iv. US DOE TRIAGE

14. Facilities in PBC Known to Use/Store Radioactive Materials (RAM)

a. PBC DEM/REP maintains a list of facilities requiring either a general or specific license for the use of RAM under NRC Regulation and FL Statute
    i. Contact the DEM REP Specialist via the CWP for details

15. ATTACHMENTS NEEDED in next update

a. Green Man diagram
b. CTOS Stay Time Table & ARG
c. DEM Radiation Survey Kit Descriptions
d. DEM Battery Corrosion Flyer
e. DOT class 7 summary
f. Anatomical Survey Form
g. NPP Green Wristband
h. Various federal RN summaries
    i. Nuclides of concern
        1. CTOS CIRS table

Palm Beach County Division of Emergency Management
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January 8, 2019+

Select References for Tactical Level Public Safety Competencies for Initial Response to a Radiological & Nuclear Emergency

PURPOSE

The purpose of list of reference is to aid the committee charged with drafting the 2019 revision to the Standard Operating Guide (SOG) for the Palm Beach County (PBC) Regional Hazardous Material Response Teams (RHMRT). Specifically these references pertain to tactical level actions for the first responder, e.g. HazMat Team, during all phases of a radiological-nuclear (R-N) emergency.

An R-N emergency is defined as:

- Nuclear Power Plant (NPP) emergency
- Radiological Dispersal Device (RDD) incident
- Radiological Exposure Device (RED) incident
- Contamination emergency
- Improvised Nuclear Device (IND) emergency

LIMITATIONS

This list is the best compilation of hazard-specific references and local plans that are known to the author. This list was compiled based jurisdictional authority, comprehensiveness and pertinence to the local mission of public safety / emergency response for the protection of human life. The National Fire Protection Association (NFPA) references were omitted because they were cited in the committee's initial outline.

SUPPLEMENTAL REFERENCES

The information provided in the 'Radiological – Nuclear' section is, in many cases, excerpted from other plans and guidance documents; all of which, for reasons of practicality, cannot be included into one document. Therefore, the reader/user must refer to additional documents as necessary.

WARNING: MATERIAL PRESENTED IN THIS SOG IS NOT A SUBSTITUTE FOR TRAINING – RESPONDERS ARE ADVISED TO TAKE CLASSES

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UNITS OF MEASURE

- **English System:**
  - REM: an English System unit of measure of exposed radiation dose equivalent for people – Roentgen Equivalent Man
    - Abbreviated: rem
    - Commonly measured at the micro: μ and milli: m levels
    - Corresponds to Sievert in International System
      - 1rem = 10mSv
  - RAD: an English System unit of measure of absorbed radiation dose in any material
    - Abbreviated: R
    - Corresponds to Gray in International System
      - 1R = 1cGy
  - Curie: an English System unit of measure of activity (the energy being released by an isotope)
    - Abbreviated: Ci
    - Corresponds to Becquerel in the International System
    - Equal to $3.7x10^{10}$ degradations per second
      - 1Ci = 37GBq
- **International System**
  - Sievert: an International System unit of measure of exposed radiation dose equivalent for people
    - Abbreviated: Sv
      - 1Sv = 100rem
  - Gray: an International System unit of measure of absorbed radiation dose in any material
    - Abbreviated: Gy
      - 1Gy = 100R
  - Becquerel: an International System unit of measure of activity (the energy being released by an isotope)
    - Abbreviated: Bq
      - 1Bq = 27pCi
- Practical equivalencies (*per Basic Radiation Protection Technology 6th ed. DA Gollnick 2015*)
  - 1Gy=1Sv=100roentgen=100R=100rem
- Count rate and dose rate inequality
  - Count rate does not equate to dose rate
  - For radiation in air – Measure in dose rate μR/hr or mR/hr or R/hr
  - For contamination on objects – Measure in Counts Per Minute (cpm)
- Double check units of measurement (most common error). Just read the symbols aloud:
  - milli (m) SAY “M” vs. micro (μ) SAY “YOU” in order to avoid confusion
- Communicate readings calmly & speak clearly!
- Radioactive Material (RAM) typically emits multiple types of radiation
  - Example: ^{137}Cs & ^{60}Co are commonly known as industrial gamma sources, however both are also beta emitters

WORKER CLASSIFICATIONS

- Occupational Worker
  - The term occupational worker is intended to differentiate those personnel who perform work involving radioactive contamination on an emergency response basis only; as opposed to occupational radiation workers who perform work involving Radioactive Materials (RAM) as the basis of their career. The distinction is important because federal regulations stipulate different training, qualifications and dose limits for occupational workers versus emergency workers. Occupational radiation workers work with RAM that is licensed by the Nuclear Regulatory Commission (NRC). Occupational radiation workers work under strict workplace controls using engineered safeguards and/or safety procedures in order to maintain the safety and health of the workforce and the environment.
- Emergency Worker
  - Emergency workers have no set of engineered controls and safeguards for the use of RAM in their workplace. In fact, the workplace of emergency workers could be anywhere and under any conditions. Emergency workers work with situations and circumstances in which controls and safeguards for the use of licensed RAM have typically failed and life safety issues are the paramount goal. Emergency workers includes both the traditional and expanded use of the term 'first responder' as defined by the Federal Emergency Management Agency (FEMA). Emergency workers follow nearly the same protective action guidance (PAG) for radiation exposure as the general public.
- Pregnant females
  - It will be the responsibility of pregnant female emergency workers to declare their pregnancy in writing to their immediate supervisor within their organization so that this information is known by the Incident Management Team (IMT) Commander (IC) and that the pregnant female worker is given an assignment that does not jeopardize the health of the baby in terms of radiation exposure, e.g. a cold-zone assignment – DEM (SOG) #OP-052 Implementation of Radiation Exposure Control for Emergency Workers.

INSTRUMENTS & MISSION APPLICATIONS

- Response Mission
  - Using calibrated instruments is stipulated by administrative policy as a program standard for non-emergency preparedness activities. However, during an emergency response, out-of-calibration instruments shall be used regardless of their calibration date unless they are known to defective or qualify as out-of-service
    - Out-of-calibration and out-of-service have different meanings
  - Typically response mission instruments utilize Geiger-Mueller (GM) detectors, which are less responsive than scintillator based instruments
  - Response Mission instruments in Palm Beach County are eligible for annual recalibration by the Bureau of Radiation Control at no cost as part of the REP program[1]
- Prevent / Interdiction Mission
  - Using calibrated instruments AND certified operators at all times is a legal requirement for successful prosecution

[1] See the DEM *Radiation Survey Kit Contents, Instructions and Safety Information* booklet in the Appendix

- Typically Prevent Mission instruments utilize scintillator detectors which are more responsive, but can overload more easily than GM detectors
- Prevent mission instruments in Palm Beach County are NOT eligible for annual recalibration by the Bureau of Radiation Control
  - These instruments are typically purchased

OPERATIONAL CHECK OF INSTRUMENTS

- Applicable plan / SOG:
  - DEM SOG #OP057 *Maintenance of Radiological Response Instrumentation*
- All instruments must be operationally checked prior to use
  - Perform a visual & electrical inspection
    - **REMOVE BATTERIES WHEN INSTRUMENTS ARE NOT IN USE**
      - **Battery acid corrosion is the number one cause of instrument failure**
  - Power up the instrument in a known low-background area
  - Observe the digital sequence and refer all error messages to qualified personnel
  - Check the instrument's operability using a source of gamma radiation
    - Readings must increase as distance between the source and instrument decrease
    - Readings must decrease as distance between the source and instrument increase
  - Check for calibration sticker – See the Instruments and Mission Applications section

CONTAMINATION

- Unwanted Radioactive Material (RAM) in an unwanted place/object:
  - Person
  - Package
  - Vehicle
  - Facility
- For contamination on objects – Measure in Counts Per Minute (cpm)
- Numerical value of contamination:
  - The FEMA REP 21/22 documents stipulate 300cpm as the initial value of contamination.
  - This value pertains to NPP emergencies only.
    - The specific value was calculated due to the known composition of NPP contamination, which is heavy in Noble gases, Iodine, Cesium, possibly Strontium and the relationship of this mixture of nuclides to personal injury.
  - Other types of R-N emergencies will have different values for contamination. The initial value of contamination for these emergencies usually <u>starts at twice background in cpm</u>
  - Remember, <u>twice background in cpm is only a starting point</u> for the value of contamination
    - Incident command sets the value of contamination, as the value is directly proportional to workload and resources
    - The value of contamination will change for different incidents and over the course of a single incident
- Measure contamination with pancake probes
  - 44-9 Geiger-Mueller is the most common pancake probe
    - Ludlum 26 & 26-1
  - Protect probe from being contaminated – use one layer of latex/nitrile/plastic film
- Ascertain the type of radiation you are attempting to measure
  - Alpha or Beta or Gamma
  - Neutron with only specialized instruments

MONITORING OPERATIONS

- DEM SOG #OP050: *Monitoring for Radiological Contamination*
  - Summary for KNOWN situations and circumstances:
    - THIS SUMMARY IS NOT FOR UNKNOWN SITUATIONS, e.g. SUSPICIOUS PACKAGES/VEHICLES – contact Explosive Ordnance Disposal (EOD) team – Mandatory
    - Follow guidance for Operational Check of Instruments
    - Follow supplemental guidance provided within instrument case
    - Utilize the appropriate detection technology for the type of radiation to be detected
    - Utilize the appropriate energy compensation filter or shielding as necessary
    - For handheld devices – Follow a methodical system of surveying/frisking:
      - For people see the "Green Man" survey chart as a guide[2]
        - Focus attention on face, then hands, then feet/shoes, then the body, both front and back
        - When necessary, use two (2) or more personnel working as a team to expedite operations
        - Record readings on the appropriate form or chart
        - Suspected cases of internal contamination require clinical care at a hospital
      - For packages, survey five (5) sides
        - Avoid moving or opening the package
      - Movements & distances
        - Linear movement of the detector shall be at the rate of 1-3 inches per second or slower as necessary
        - Vertical distance of the detector above the surface of the object shall be at 1-3 inches unless otherwise specified
    - For portal monitoring operations
      - Used for large-scale emergency response
      - Refer to Simplified Operating Instructions provided in the instrument case
      - Ludlum 52-1 series portal monitors are:
        - Configured for "walk-through" mode
        - Pre-programmed standard of detection = 1.0 µCi ^{137}Cs of contamination (one micro Currie)
      - Actions for Positive Detection
        - RED light and Audible Alarm indicates contamination – Direct to Decontamination Station
        - Observe quadrant that shows highest numerical values
        - Note on paperwork which quadrant shows highest value for person being monitored:
        - e.g. Upper Right, or Upper Left, or Lower Right, or Lower Left
        - Disregard actual the actual numerical values unless directed otherwise

[2] See the 'green man survey diagram' in the Appendix

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DECONTAMINATION AND INITIAL ON-SCENE WASTE MANAGEMENT

- Radioactive materials cannot be made non-radioactive. The energetic properties of radionuclides follow a decay process, which cannot be altered with chemical reactions, as is the case with many (toxic) chemicals that are common in hazardous material response.
    - Ten (10) half-lives is the practical point at which a radionuclide loses its energetic properties.
- For decontamination operations radioactive waste must be minimized to the greatest extent possible. This is especially true for the discharge of wastewater or effluent.
    - For NPP emergency response, the discharge wastewater does not need to be contained per FEMA guidance.
    - For other radiation emergencies, the discharge wastewater shall be contained to the greatest extent practicable.
- Because of this limitation, dry-spot-decon techniques are the preferred method of decontaminating radioactive materials (RAM). Utilize a combination of the following techniques:
    - Garment removal
    - Lint rollers
    - Adhesive tape
    - Electrostatically charged fabric
        - Radionuclides have an affinity for man-made fabrics, e.g. polyester, etc.
    - Baby wipes
- Gross-wet decon techniques should be considered as a last resort.
- All radioactive waste shall use a minimal amount of effective packaging, identified as radioactive, and segregated for final disposal.
- Quarantined belongings shall not be misconstrued as radioactive waste.
- Areas and containers used for radioactive waste and quarantined belongings shall be monitored for excessive exposure.
- A ‘step-off-pad’ shall be used when moving between hot-warm-cold zones.

PROTECTIVE ACTION GUIDANCE

- The US Environmental Protection Agency (EPA) has a Manual of Protective Action Guides (PAGs) and Planning Guidance to assist public officials in planning for emergency response to radiological incidents. Research PAGs and other facts on the REMM website or mobile application: https://www.remm.nlm.gov/pag.htm

- The EPA PAGs for Emergency Workers (EW) and the General Public (GP) are summarized in the following table:

1-5 rem	GP: Projected dose over four (4) days
5 rem	EW: Maximum dose for the duration of the response for all activities
10 rem	EW: Maximum dose for protecting critical infrastructure
25 rem	EW: Maximum dose for life safety actions
>25rem	EW: Life safety actions for large populations
500 mrem	EW: Maximum dose per day per FL BRC
5 R/hr	EW: Turn back now or turn around dose rate per FL BRC

- For EWs protecting themselves, PAGs are not strict limits but instead are decision points
- For the GP, PAGs can include the following actions:

  - Evacuating an area
  - Sheltering-in-place within a building or protective structure
  - Administering potassium iodide (KI) as a supplemental action when authorized
  - Relocation
  - Acquiring an alternate source of drinking water
  - Interdiction of food/milk
- The FL Bureau of Radiation Control (BRC) has set additional administrative PAGs for EWs which are listed in the table.
- Incident Command may set additional PAGs for EWs that are specific to the incident.
- Biological effects begin to be detectable at approximately 40 to 50rem.

DECISION POINTS & DOSE LIMITS FOR EMERGENCY WORKERS

- Cumulative Dose is expressed as Total Exposure Dose Equivalent (TEDE), e.g. whole body
- Dose Rate
  - Relates to stay-time and answers the question: how long can I work in a radioactive environment before I reach a decision point or dose limit?
    - See the stay time chart in the appendix
- Decision Point
  - Decision point is a calculation that an individual responder must make for him or herself based on dose rate, stay time, criticality of mission assignment and other non-radiological conditions, e.g. heat, personal safety, etc.
    - Allows for variance, e.g. receiving a higher dose, based on circumstances and informed consent of the responder
      - Example: staying longer in a radiation area and receiving a higher dose of radiation than guidance allows for, in order to save lives
    - Response actions, either ordered or self-evident, must evaluated on an individual and voluntary basis, with informed consent of the risk posed by proceeding; provided the individual(s) performing the response action have the requisite training for the task/assignment to be undertaken.
- Dose Limit
  - An agency based administrative limit that stipulates an action.
    - Does not allow for variance, strict compliance
      - Example for rate: turn back now at dose rate of 5R/hr
      - Example for cumulative dose: 500mrem/day or 5R for all activities over the duration of the incident

LOGISTICS

- Collectively between all the emergency response agencies having jurisdiction in Palm Beach County, there are enough radiation detection instruments, supplies and equipment necessary to initiate a response to a large-scale radiation emergency.
  - The DEM Hazard Specific Plan for Nuclear Power Plant Emergency, stipulates in an appendix, many pre-identified resources that will be needed to support a response to a NPP emergency as planned. That appendix is attached to this SOG.
  - The DEM RERC FOG also stipulates guidance on logistical support as well as initial mobilization strategies.

- Unit Leaders at each RERC will need to initiate resource requests for additional supplies and Personnel Protective Equipment (PPE) using the incident command structure at each RERC.
- The RERC IC and Logistics Section Chief will need to plan for and implement the logistical support necessary for extended operations at each RERC. This support includes but is not limited to the following:
  - Electrical power & lighting
  - Port-a-poties & servicing
  - Solid waste management
  - Large tents
  - Mesh Wi-Fi networks
  - Helicopter LZ
  - Semi-trailers
  - National Guard

- The DEM maintains a cache of instruments at the Emergency Operations Center (EOC), which is located at 20 South Military Trail, West Palm Beach. The EOC is a 24/7 facility.
  - A cache of 200 TLD/OSLDs is stored at the PBC EOC/room #166. These mission-critical devices need to be separated into two (2) lots and delivered to the IC at each RERC. Two (2) orange colored Pelican brand cases are supplied with the cache for this purpose.
- Additional instruments, supplies and equipment are stored at the PBC Purchasing Warehouse, which is located at 2455 Vista Parkway, West Palm Beach 2nd floor. The Warehouse maintains regular business hours, however there is access via a Knox Box.
  - All the DEM radiation portal monitors are stored at the PBC Purchasing Warehouse.
  - All the DEM green colored evacuee identification wristbands are stored at the PBC Purchasing Warehouse and are pre-separated into two (2) lots.
    - Two (2) black colored Pelican brand cases contain the cache for deployment to each RERC.
- The DEM maintains two (2) 16-ft trailers at each Radiological Emergency Reception Center (RERC). Each trailer contains safety cones, station kits & field desks, specialized signage and the Station 2R vehicle rinse bar & ramp assemblies. These trailers are stored inside the Maintenance Compounds of each park and utilize a 2 5/8 inch ball coupling for towing. For access or movement, contact the CWP 24/7 at 561-712-6428.
  - Okeeheelee RERC – 7500 Forest Hill Blvd, West Palm Beach
  - John Prince RERC – 4759 South Congress Ave, Lake Worth

PERSONAL PROTECTIVE EQUIPMENT

- Recommended Personal Protective Equipment (PPE) for “hot zone” operations in Radiological Emergency Reception Centers (RERCs) for Nuclear Power Plant (NPP) emergency response:
  - Level D: eye protection, N95, gloves, outer-ware, and boot/shoe covers.
- Gamma radiation will penetrate all levels of commonly used first-responder PPE
  - Use PPE to guard against internal & cross contamination
- Use eye protection to guard against / mitigate beta radiation damage to eye tissue
- For response involving very high dose rate gamma exposure, it is important to shield the hips which is the area of the body with high concentrations of bone marrow

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POTASSIUM IODIDE (KI)

- Potassium Iodide (KI) is a salt that is used as a radiopharmaceutical to protect the thyroid gland from radioactive contamination that may occur during a NPP emergency. If radioactive material were to be released during a NPP emergency, radioactive Iodine will be a major component of the contamination. Potassium Iodide acts as a chemical shield or blocking agent that thwarts the harmful effects of radioactive Iodine on the thyroid gland. When administered prophylactically, KI "saturates" the thyroid gland with "clean" Iodine before the contaminated Iodine can be absorbed. Potassium Iodide is not an antidote for radiation sickness or radiation poisoning, and it is only effective against radioactive Iodine and not other nuclides. Not everyone will need KI during an NPP emergency. Some people are allergic to Iodine.
- Florida Health – Palm Beach County (DOH) maintains current lots of KI in secured conditions within its warehouse and/or pharmaceutical divisions within PBC. Lots are managed in accordance with manufacturer's recommendations. The reported usable lifespan of PBC's current lot of KI is ten (10) years. The lot consists of two hundred and six thousand (206,000) doses of 65mg ThyroSafe® brand tablets, which were received in PBC on July 21, 2015. The stamped expiration date on the package indicates an expiration date of "07/2025".
- Potassium Iodide is ineffective for contamination that does not contain radioactive Iodine.
- Potassium Iodide will typically be used for Nuclear Power Plant emergency response (only).
- Research KI facts on the REMM website or mobile application: https://www.remm.nlm.gov/potassiumiodide.htm

BASIS OF RADIATION PROTECTION

- Always work using the As Low As Reasonably Achievable (ALARA) principle
  - Radiation doses must be kept to levels that are ALARA
  - Receiving a dose of radiation must be justified, e.g. saving a life, preventing damage to critical infrastructure, required medical purposes
  - Implement ALARA using the following actions:
    - Minimize Time Near a Radiation Source
    - Maximize Distance From a Radiation Source
    - Use Shielding Between You and the Radiation Source
- Practical field applications for implementing ALARA
  - To minimize time:
    - Use Stay-Time Tables and monitor dose rates using digital instruments
  - To maximize distance:
    - Use the Inverse Square Law: Exposure = Activity / distance^2
      - Moving away: "Double the distance = quarter the dose" (1/4X)
  - To use shielding:
    - Use water in any form, e.g. bottles, jugs, cases, skids, tanks & tankers, etc. to mitigate the effects of radiation – It's plentiful and cheap.

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STATUTORY AUTHORITY

- Florida is a Nuclear Regulatory Commission (NRC) Agreement State; which essentially means that NRC regulations are implemented by state authorities. In Florida, the FL Bureau of Radiation Control is responsible for statewide health physics and radiation protection actions.
    - Authority:
        - Section 64-E5 Florida Administrative Code
        - Chapter 404 Florida State Statute
    - Contact FL Bureau of Radiation Control
        - 24/7 Duty Officer: 407-297-2095
        - Office and laboratory: 407-297-2096

EMERGENCY RESPONSE PRIORITIES FOR ANY RADIATION EMERGENCY

- Do not delay life safety actions because of a radiological hazard
    - Rescue the victim(s) quickly => move away from the radiation source or general area
    - Triage the wounded away from the radiation source or general area
    - Treat the medical conditions using existing protocol
    - Transport to a hospital using existing protocol
- Decontamination is a secondary concern
- Life-safety and urgent medical conditions are primary concerns

ADJUDICATING RADIATION ALARMS

- The fundamental steps of dealing with a radiation alarm are primarily utilized in the Prevent Mission for interdiction purposes, but these steps are also applicable to Response Mission
    - Detect – Find ionizing radiation using an in-service instrument
    - Verify – Repeat the detection with the same or another instrument
    - Locate – Use a reasonable amount of time to find the area of highest reading
    - Measure – Record the reading & the distance from the source using the proper units of measure
    - Identify – {only when appropriate} Use instrumentation to determine the nuclide(s) involved
    - Assess – Use training & field references to determine the severity & impact your findings
    - Adjudicate – Make a judgement about protective actions at the lowest possible level of authority (local, then state, then federal) (*"don't panic and cry wolf"*)

CONSULT SUBJECT MATTER EXPERTS

- Local (1st call)
    - DEM Radiological Emergency Preparedness Planner
        - County Warning Point 24/7
            - Telephone: 561-712-6428
            - PBC Radio: EM-CALL
            - E-mail: CountyWarningPoint@pbcgov.org
- State (2nd call)
    - Bureau of Radiation Control (BRC)
        - 24/7 Duty Officer Telephone: 407-297-2095

- Federal (3rd call)
  - Prevent Mission - Interdiction
    - Reach-back to US DOE Triage which is direct support for Secondary Screeners for spectral analysis and subject matter expertise for identification of unknown nuclides
      - 24/7 Watch Office in Washington DC:
        - Telephone: 202-586-8100 or 800-832-0890 ask for ERO
        - E-mail: triage.data@hq.doe.gov
  - Response Mission
    - Radiation Emergency Assistance Center / Training Site (REAC/TS) for US DOE
      - 24/7 Emergency Center in Oak Ridge TN:
        - 865-576-1005
    - US DOE National Nuclear Security Administration (NNSA)
      - Contact via State Watch Office (SWO) or Bureau of Radiation Control (BRC)
      - Deployable assets include:
        - Aerial Measurement Service
        - Federal Radiological Monitoring & Assessment Center
        - Radiological Assistance Program
        - Accident Response Group

DISPATCH CODES

- Currently no codes exist for radiation alarm or radiation emergency. County Fire Rescue dispatch will use the following incident types along with notes in the Computer Aided Dispatch (CAD) system to initiate a response to a radiation emergency:
  - Hazardous Materials Investigation
  - Mass Casualty Incident

MOBILIZATION FOR NUCLEAR POWER PLANT EMERGENCY

- Nuclear Power Plant Emergency – Essentially a planned event NOT a spontaneous incident
  - Applicable plan / SOG: DEM SOG #OP041
  - Read Mobilization section of RERC FOG
    - Mobilize Radiological Emergency Reception Centers (RERC) – All stations & support elements
  - Prepare for extended operations

NOTIFICATIONS

- The County Warning Point (CWP) (also known as EOC) is the principle means of making the appropriate notifications to multiple agencies at the local, regional, state and federal levels of government with just one (1) notification:
  - County Warning Point 24/7 – Located within the EOC
    - Telephone: 561-712-6428
    - PBC Radio: EM-CALL
    - E-mail: CountyWarningPoint@pbcgov.org

- *For example notifying the CWP of a radiation incident discovered by a first responder will automatically generate notifications to the State Watch Office (SWO), FDLE, DEP, BRC, FBI, NRC along with other state & federal agencies.*

- By notifying the CWP, field command personnel are fulfilling their responsibilities under the county's Comprehensive Emergency Management Plan.
- Prompt notification to the CWP ensures that statutory obligations are met, resource management and financial reimbursement protocols are followed.
- The SWO is housed within the State EOC, which is in Tallahassee. The SWO is a 24/7 operation.
  - Telephone: 850-413-9911
  - Radio: SLERS inter-local talk group (contact CWP)
- Directly notify investigative agencies, e.g. FDLE & FBI, in accordance with local protocol
  - The FDLE & FBI will be automatically notified via the SWO

CONSEQUENCE MANAGEMENT

- The Division of Emergency Management (DEM) is the local agency responsible for managing the consequences of on-scene crisis management (field) actions.
  - DEM Duty Officer:
    - Telephone: 561-644-8527
    - E-mail: dofficer@pbcgov.org
- The Emergency Operations Center (EOC) is the inter-agency (body) that manages policy, sets goals and implements strategies on behalf of the Board of County Commissioners, during large-scale emergencies.
- The Comprehensive Emergency Management Plan (CEMP) is the county-wide document upon which all large scale emergency actions are based.

TRAINING

- Applicable plan/SOG: DEM SOG #OP058
- 12-18 contact hours of radiation training per year is recommended to maintain perishable knowledge, skills and abilities (KSAs)
- The following agencies/organizations offer hands-on radiological training at no charge:
  - The Bureau of Radiation Control (BRC)
  - Counter Terrorism Operations Support (CTOS)
  - Center for Domestic Preparedness (CDP)
  - Palm Beach County Division of Emergency Management (DEM)
- Contact the DEM REP Planner for details on course content, availability and recommendations on course selection
  - Short (one-two hours) station-style refresher Pre-Operations Refresher Training (PORT) courses are available for 15+ different topics
- **WARNING: MATERIAL PRESENTED IN THIS SOG IS NOT A SUBSTITUTE FOR TRAINING**

TAKE CLASSES

Palm Beach County Division of Emergency Management
Emergency Operations Center
Mike Geier – Radiological Planner

Initial Actions for Improvised Nuclear Device (IND) Detonation

- Recognize that an IND has detonated
  - Flash of most brilliant light – brighter than sunlight
  - Likely sound of thunder
  - Inoperable electronics
  - Possible mushroom cloud
- Go Inside and Stay Inside for two days
  - Deep interior room of a high-density concrete-structure is preferable
    - Underground is best
  - 7-10 Rule: For every sevenfold increase in time after detonation, there is a tenfold decrease in the radiation rate
- Avoid sand-sized fallout particles & settling dust – This material can be potentially lethal
  - Remove outer clothing
  - Decontaminate gently & repeatedly
- Beware of nausea, vomiting, diarrhea – Note time of onset – seek medical attention if safe
- Attempt to stay informed & communicate using safe practices

Initial Field Actions for Response to Radiological Dispersal Device (RDD) – Dirty Bomb

Follow US Department of Homeland Security (DHS) flexible guidance for initial response tactics during the first 100 minutes of a response to an RDD incident:

- Respond and be capable of detecting radiation
- Confirm / validate that radiation is present (or not)
- Request technical assistance
- Report preliminary scene information
- Initiate life-safety actions
- Issue initial protective actions
- Initiate orderly evacuation
- Secure & manage the scene
- Measure & map radiation levels
- Conduct monitoring & decontamination operations

Transition to Unified Command or Incident Management Team upon their arrival

RadResponder Portal & Mobile Application

- https://www.radresponder.net/
- Applicable plan/SOG: DEM SOG #OP059
- The primary purpose of RadResponder is to serve as a easily accessibly electronic platform into which field data can be submitted, aggregated, reviewed, approved and prepared for use by the Federal Radiological Monitoring & Assessment Center (FRMAC); who will in turn develop predictive and analytical products for emergency consequence management decision making
  - RadResponder has many other highly useful features including:
    - GIS interface for RDD response & plume modeling
    - Responder tracking
    - Mobile app for data entry

        - Fixed sensor integration
        - Reference material & links to many important websites
- Utilize RadResponder according to your training, skill level and comfort level – If you're not sure of what you're doing, then get out of the program
    - Questionable measurements and data are worthless because unreliable information is and impediment to the operation and decision making process
- Use the RadResponder mobile app on your smart phone to enter field data as directed and in accordance with your training – Follow the prompts & sequence on the app as directed
- During a Local State of Emergency (LSE), the EOC may require that response agencies link or share their RadResponder accounts to the PBC DEM RadResponder account
    - Likewise, personnel who are qualified as Radiation Safety Specialists may be required to temporarily backfill various functional roles in DEM / EOC's RadResponder data management process

PRIMER ON RADIOACTIVE MATERIALS IN TRANSIT

- Label & Placards
    - White I
        - Extremely low radiation levels 0.5 mrem/hr (0.005 mSv/hr) maximum on surface
    - Yellow II
        - Low radiation levels >0.5 - 50 mrem/hr (0.5 mSv/hr) maximum on surface; 1.0 mrem/hr (0.01 mSv/hr) maximum at 1 meter
    - Yellow III
        - Higher radiation levels >50 - 200 mrem/hr (2 mSv/hr) maximum on surface; 10 mrem/hr (0.1 mSv/hr) maximum at 1 meter
    - FISSILE
        - Applied to packages that contain fissile materials. The Criticality Safety Index (CSI) for each package will be noted on the label. When used, the fissile label will appear adjacent to the radioactive material label.
    - Transport Index (TI) = Square box on Yellow II & Yellow III packages
        - The TI is determined by taking the maximum radiation level (as measured in mrem/hr) at one meter (3.3 feet) from an undamaged package.
    - Allowable margin of error: 20%
- ERG Guides #161-166 outline Hazards, Safety & Response
- UN #s 2908—2919 identify radioactive material (RAM)
- Package types:
    - Excepted – Contain extremely low level RAM – consumer products
    - Industrial – Contain low level RAM – radioactive wastes
    - Type A – Contain commonly transported RAM – radiopharmaceuticals & soil/moisture density gauges
    - Type B – Contain highest levels of potentially lethal RAM – industrial radiography sources, spent nuclear fuel
- Dose rate limits for transport – Strict limits, not decision points
    - Non-Exclusive Use
        - 200 mR/hr (2 mSv/hr) at surface of package
        - Individual packages cannot exceed 10 mR/hr (0.1 mSv/hr) at 1 meter
    - Exclusive Use
        - 2 mR/hr (0.02 mSv/hr) in cab

        - 200 mR/hr (2 mSv/hr) on surface of vehicle
        - 10 mR/hr (0.1 mSv/hr) maximum at 2 meters
        - Under certain conditions, individual packages on exclusive-use vehicles can have readings up to 1 R/hr (10 mSv/hr) on contact with package surface.
- 47 page DOE-FEMA-DOT reference link: https://www.energy.gov/sites/prod/files/em/TEPP/RadioactiveMaterialTransportationandIncidentResponse-QABook.pdf
- Prevent mission tips specific to RAM transport & emergency response
    - Be aware of masking, which is using legitimate RAM cargo mask/disguise the transport of RAM for illicit/illegal purposes, e.g. possible RDD
        - Assist law enforcement efforts & report findings
        - Be thorough on survey techniques
        - Review shipping papers & compare against labels & survey results
        - Be curious with nuclear medicine patient-drivers/passengers
            - Watch for signs of nervousness & anxiousness during surveys/review

AIR MONITORING

- Continuous Air Monitors
- BRC, CST, RAP
- DAC ALI PAG
- Indications for respiratory hazard

DOSIMETRY

- Applicable plan / SOG:
    - DEM Implementation Guide for Area Dose Rate Monitoring
    - DEM SOG OP-052 – Emergency Worker Exposure Control
    - OSLDs/TLDs not required for type IV response (typical multi-unit call for service)
    - Area dose rate monitoring is the preferred method for monitoring dose rate
        - Old pencil-type optically-based direct reading dosimeters are less effective
        - Use gamma survey instruments that are currently in service in radiation kits
            - RadEye G/GF & Canberra Ultra Radiac
                - Clear accumulated dose before implementation
        - Designate a knowledgeable/trained Radiation Safety Specialist (RSS) who will monitor dose rate for the entire team
            - RSS candidates are always needed – Contact DEM for details
    - Follow published PAGs & expert guidance
        - See Protective Action Guidance section

COMMON MEDICAL NUCLIDES/ISOTOPES

A nuclear medicine patient who has received treatment or diagnostic procedures in the past few weeks will likely trigger a radiation alarm. Source: *DHS/DNDO Quick Reference Guide October 2009* – Information is not absolute – Do not base a law enforcement action or recommendation solely on the nuclides/isotopes on this list.

- Gallium (Ga-67) Imaging of areas of inflammation
- Indium (In-111) Imaging of infection/white blood cell formation
- Iodine (I-123, I-124, I-125, I-131) Treatment of cancer, in particular thyroid cancer
- Lutetium (Lu-177, Lu-177m) Treatment of colon cancer, bone cancer, non-Hodgkin's lymphoma, lung cancer, and treatment of prostate, breast, and lung tumors
- Phosphorus (P-32) Inflammation associated with joint pain
- Palladium (Pd-103) Treatment of prostate cancer
- Rubidium (Rb-82) Cardiac imaging techniques
- Samarium (Sm-153) Pain treatment for bone cancer
- Strontium (Sr-89) Bone pain relief for patients with prostate cancer
- Technetium (Tc-99m) Most common medical isotope for cardiac stress tests
- Thallium (Tl-201) Imaging for heart related conditions
- Xenon (Xe-133) Imaging of heart, lungs, brain and blood flow

Nuclear medicine patients may present dose rates in excess of 50 mR/hr immediately after their procedures

LOCAL PLANS & PROCEDURES

Title	Number	Agency	Application
Nuclear Power Plant Emergency – Hazard Specific Plan	2018	PBC Division of Emergency Management (DEM)	Overall hazard framework, context, phases, authority, resources, management procedures
Field Operations Guide for Radiological Emergency Reception Centers (RERCs)	2016	PBC DEM	Procedural framework, stations, positions, references
Area Dose Rate Monitoring Implementation Guide	April, 2019	PBC DEM	Procedures for dose rate monitoring and dosimetry with limited / mixed resources
Mobilization of Staff and Resources for a NPP Emergency	SOG OP-041	PBC DEM	Policy & implementation procedures, position specific job aids
Radiological Monitoring	SOG OP-050	PBC DEM	Policy & implementation procedures
Registration of Contaminated Evacuees During an NPP Emergency	SOG OP-51	PBC DEM	Policy & implementation procedures
Radiation Exposure Control	SOG OP-52	PBC DEM	Policy & implementation procedures
Maintenance of Radiological Response Instrumentation	SOG OP-57	PBC DEM	Policy & implementation procedures
Radiological Training for Emergency Workers	SOG OP-58	PBC DEM	Policy & implementation procedures
Radioactive Materials Incidents & Radiation Detection	GO 532.13	PBSO	Policy & implementation procedures
Response to HazMat/WMD Incidents	SOG 2401	PBCFR	Policy & implementation procedures
Emergency Gross Decontamination	SOG 2407	PBCFR	Policy & implementation procedures
EOD/WMD Assist	SOG 2412	PBCFR	Policy & implementation procedures
		WPBFR	NEEDED
		DBFR	NEEDED
		BRFR	NEEDED
		SWA	NEEDED

REFERENCES

Title	Number	Agency	Application
Protective Action Guides and Planning Guidance for Radiological Incidents	EPA-400/R-17-001 January 2017	US Environmental Protection Agency	Decision points and context for dose
Emergency Worker Dose Limits	SOP 14, January 2016 (Rev2019 pending)	Florida Department of Health – Bureau of Radiation Control	Florida standards on dose for emergency workers
Florida Hazardous Material Technician Competency Assessment Check Off	2015	SERC	Task book competencies for radioactive material specialty
Responding to a Radiological or Nuclear Terrorism Incident: A Guide for Decision Makers	Report # 165, 2010	National Council of Radiation Protection (NCRP)	Control zones
Guidance for Emergency Response Dosimetry	Report # 179, 2017	NCRP	Emergency response dosimetry
Key Elements of Preparing Emergency Responders for Nuclear and Radiological Terrorism	Commentary No. 19	NCRP	Consequence management for IND & RDD attack
Management of Persons Contaminated with Radionuclides	Report # 161-1, 2008	NCRP	Practical & scientific basis of contamination
Radiological Emergency Preparedness (REP) Program Manual	P1028 2016	Federal Emergency Management Agency (FEMA)	National program standards
Contamination Monitoring Standard for a Portal Monitor Used for Radiological Emergency Response	REP 21, March 1995	FEMA	Specific guidance for portal monitors
Background Information on Contamination Monitoring Guidance for Portable Instruments Used for Radiological Emergency Response to Nuclear Power Plant Accidents	REP 22, October 2002	FEMA	Detailed guidance on contamination
Population Monitoring in Radiological Emergencies	Second edition	Centers for Disease Control and Prevention	Guidance for large scale consequence management operation
Radiological Dispersal Device Response Guidance – Planning for the First 100 Minutes	November 2017	US Department of Homeland Security	Recommended procedures for first responders
Handbook for Responding to a Radiological Dispersal Device – First Responders Guide to the First 12 Hours	September 2008	Council of Radiation Control Program Directors	Guidance for early phase actions
Quick Reference Guide: Radiation Risk Information for Responders Following a Nuclear Detonation	December 2016	13 Federal Agencies	Overview guidance for response, a primer
Basic Radiation Protection Technology 6th Edition	January 2015	DA Gollnick/Pacific Radiation Corp. Altedena CA	Basic textbook of radiation protection
Los Alamos Radiation Monitoring Notebook	2015	JT Voss NRRPT/CHP	References
Field Guide for Health & Safety Officers Radiological Incidents	June 2014	New York City Department of Health & Mental Hygiene	References
Rad Quick Reference Guide	October 2016	DHS/DNDO	References

S. **Appendix K** – Target Hazards

Note, this appendix intentionally left blank for next update

1. High Consequence 302s