

### 3.4.2.1 Hazmat-Personal Protective Equipment



YOUR ORGANIZATION  
STANDARD OPERATING PROCEDURES/GUIDELINES

**TITLE:** Hazmat-Personal Protective Equipment

**SECTION/TOPIC:** Hazardous Materials Response Risk

**NUMBER:** 3.4.2.1

**ISSUE DATE:**

**REVISED DATE:**

**PREPARED BY:**

**APPROVED BY:**

X

Preparer

X

Approver

These SOPs/SOGs are based on FEMA guidelines FA-197

#### 1.0 POLICY REFERENCE

CFR

NFPA

NIMS

#### 2.0 PURPOSE

This standard operating procedure/guideline addresses use of turnout gear, SCBA, PASS devices/alarms, and other equipment at hazardous materials incidents.

#### 3.0 SCOPE

This SOP/SOG pertains to all personnel in this organization.

#### 4.0 DEFINITIONS

These definitions are pertinent to this SOP/SOG.

#### 5.0 PROCEDURES/GUIDELINES & INFORMATION

##### 5.1 Use of Turnout Gear:

###### PERSONAL PROTECTIVE CLOTHING

A. The basic minimum protective clothing ensemble shall be worn by all HMRT members within the

SOP Center

Hot Zone.

- B. The minimum protective clothing ensemble may be altered to accommodate specific HMRT activities or hazards at the incident. Hazard Sector shall determine the appropriate types of chemical protective clothing to utilize. The type of protective clothing used may be changed to accommodate changes in the action plan or the status of the incident.
1. Tyvek coveralls, oil-resistant boots or boot covers, undergloves, and heavy latex (not surgical gloves) overgloves can be worn at oil spill incidents to avoid contamination when there is no danger of fire.
    - a. Cotton or cotton and leather overgloves must not be worn unless worn over the chemical-resistant glove ensemble defined above. Cotton or cotton and leather overgloves must be discarded after use.
    - b. No member may participate in spill mitigation activities in street clothes, leather shoes, sneakers, or other types of street footwear.
    - c. Firefighting turnout gear cannot be easily decontaminated and should not be worn at oil spill incidents when there is no danger of fire.
  2. At incidents where there is an actual or potential threat from fire or explosion, full firefighting turnout gear must be worn within the Hot Zone including:
    - a. Bunker pants, coat, and boots, and
    - b. Firefighting helmet with face shield, and
    - c. Firefighting gloves and hood.
    - d. SCBA with facepiece in place.
  3. At incidents where there is an actual or potential threat from chemical exposure, chemically resistant clothing must be worn within the Hot Zone including:
    - a. Flame-resistant coverall, and
    - b. Chemically-resistant coveralls with hood, and
    - c. Chemically-resistant boots or overboots, and
    - d. Chemically-resistant gloves, and

- e. Latex, cotton, or vinyl inner gloves, and
  - f. Hardhat.
  - g. Thin cotton undergloves may also be worn under inner gloves in hot weather.
  - h. Cotton undergloves may be worn under outer gloves in cold weather.
  - i. Gauntlet gloves may be worn over outer gloves to provide additional hand protection.
  - j. Cotton work gloves may be worn over outer gloves to provide additional hand protection or improve dexterity.
4. At incidents where there is an actual or potential threat from chemical exposure and fire, chemically-resistant clothing with firefighting turnout gear shall be worn within the Hot Zone including:
- a. Firefighting bunker pants, jacket, and boots, or
  - b. Chemically-resistant overboots, and
  - c. Chemically-resistant coveralls with hood, and
  - d. Flame-resistant hood and inner gloves, and
  - e. Vinyl or latex inner gloves, and
  - f. Chemically-resistant outer gloves, and
  - g. Firefighting helmet with face shield.
  - h. Firefighting gloves may be added to the ensemble at the discretion of the Safety Officer; firefighting gloves shall be used whenever fire is present, or hot surfaces are anticipated.
5. At incidents where the risk of chemical exposure is extreme, a fully encapsulated, vapor-tight protective clothing ensemble shall be worn within the Hot Zone:
- a. Flame resistant-coveralls, and
  - b. Latex or butyl undergloves, and
  - c. Chemically-resistant, vapor-tight protective outer garment, including chemically resistant outer gloves and boots, and

- d. Inner head protection, if applicable.
  - e. Thin cotton undergloves may also be worn under inner gloves in hot weather.
  - f. Cotton undergloves may be worn under inner gloves in cold weather.
  - g. Gauntlet gloves or Silver Shield gloves may be worn under outer gloves to provide additional hand protection.
  - h. Cotton work gloves may be worn over outer gloves to provide additional hand protection or improve dexterity. Cotton work gloves must be discarded after use.
6. At incidents where the risk of chemical exposure is extreme, and there exists a real or potential threat from flashover and/or fire, a fully encapsulated, vapor tight protective clothing ensemble with flashover protection shall be worn within the Hot Zone:
- a. Flame-resistant coveralls, and
  - b. Flame-resistant hood and inner gloves, and
  - c. Vinyl or latex inner gloves, and
  - d. Chemically-resistant, vapor tight protective outer garment, including chemically resistant outer gloves and boots, and
  - e. Flashover-resistant protective outer garment, including outer gloves and boot covers, and
  - f. Inner hard hat, if applicable.
7. At incidents involving unknown or uncharacterized hazardous materials, where there is evidence of a potential fire or explosion threat (based on previous events or instrument readings), chemically-resistant clothing with firefighting turnout gear shall be worn within the Hot Zone including:
- a. Firefighting bunker pants, jacket, and boots, or
  - b. Chemically-resistant overboots, and
  - c. Chemically-resistant coveralls with hood, and
  - d. Flame-resistant hood and inner gloves, and
  - e. Vinyl or latex inner gloves, and

- f. Chemically-resistant outer gloves, and
  - g. Firefighting helmet with face shield.
  - h. Firefighting gloves may be added to the ensemble at the discretion of the Safety Officer; firefighting gloves shall be used whenever fire is present, or hot surfaces are anticipated.
8. At incidents involving unknown or uncharacterized hazardous materials, where there is no evidence of a potential fire or explosion threat (based on instrument readings), chemically resistant clothing must be worn within the Hot Zone including:
- a. Flame-resistant coverall, and
  - b. Chemically-resistant coveralls with hood, and
  - c. Chemically-resistant boots or overboots, and
  - d. Chemically-resistant gloves, and
  - e. Latex or vinyl inner gloves, and
  - f. Hardhat.
  - g. Thin cotton undergloves may also be worn under inner gloves in hot weather
  - h. Cotton undergloves may be worn under outer gloves in cold weather
  - i. Gauntlet gloves may be worn over outer gloves to provide additional hand protection.
  - j. Cotton work gloves may be worn over outer gloves to provide additional hand protection or improve dexterity.
- C. The HMRT has the following types of protective clothing available for use:
- 1. Reusable coverall with hood.
  - 2. Disposable fully encapsulated splash protection garment (coverall with hood).
  - 3. Fully encapsulated, vapor-tight chemical protective clothing with chemically-resistant boots and gloves.
  - 4. Fully encapsulated, vapor-tight chemical protective ensemble with Aluminized fire resistant

flashover cover.

5. Firefighting turnout coats, boots, and helmets.

6. Fire-resistive gloves and hoods.

7. Hardhats with face shields.

8. Chemical-resistant gloves:

- a. Butyl.
- b. Silver Shield.

9. Non-chemical-resistant gloves:

- a. Heavy latex (not surgical) gloves.
- b. Latex or vinyl surgical (inner) gloves.
- c. Cotton undergloves.
- d. Cotton work gloves.

10. Latex/neoprene boot covers.

## **5.2 Use of SCBA:**

### **RESPIRATORY PROTECTION**

A. The Hazard Sector shall determine the type of respiratory protection required within the Hot Zone and the Warm Zone.

1. At incidents where there is an actual or potential threat from fire or explosion, full firefighting turnout gear must be worn within the Hot Zone:
  - a. Positive pressure self-contained breathing apparatus (SCBA) shall be utilized in the Hot Zone.
2. At incidents where there is an actual or potential threat from chemical exposure to high concentrations of known hazardous materials, or exposure to unknown or uncharacterized materials:
  - a. Positive pressure SCBA shall be utilized in the Hot Zone.
3. At incidents where there is an actual or potential threat from chemical exposure and fire:

- a. Positive pressure SCBA shall be utilized in the Hot Zone.
4. At incidents where a fully encapsulated, vapor-tight protective clothing ensemble is required:
    - a. Positive pressure SCBA shall be utilized.
  5. At incidents where the oxygen concentration in the work zone is less than 19.5%:
    - a. Positive pressure SCBA shall be utilized.
  6. At incidents where there is a real or potential threat of low level radioactivity in the form of alpha and beta particles and chemical exposure:
    - a. Positive pressure SCBA shall be utilized in the Hot Zone.
  7. At incidents where there is a real or potential threat of low level radioactivity in the form of alpha and beta particles and no threat from chemical exposure:
    - a. Positive pressure SCBA shall be utilized.
  8. At incidents where there are low concentrations of known materials that can be quantified using instrumentation:
    - a. Positive pressure SCBA; or
    - b. Air-purifying full-faced respirator (APR) equipped with organic vapor/acid gas cartridges (OV/AG) can be utilized in the Hot Zone.
  9. Restrictions on the use of APRs:
    - a. APRs shall be used only by those members who have successfully passed a qualitative fit test within the calendar year.
    - b. APRs shall be utilized only when concentrations of known hazards can be quantified, and the concentration present does not exceed the capacity of the cartridge.
    - c. APRs shall be full-face; half-face APRs shall not be used.
    - d. APRs shall be utilized only if there is an approved cartridge for the chemical hazards present.
    - e. APRs shall not be utilized when:
      - The concentration of oxygen in the work zone is less than 19.5%; or
      - The concentration present exceeds the capacity of the cartridge; or

- The concentration present exceeds 50 times the PEL or TWA for those materials which have a recognized OSHA or ACGIH exposure limit; or
  - The concentration present exceeds the IDLH for those materials which have an assigned IDLH; or
  - There is no approved cartridge for the hazard present.
- f. Cartridges shall be promptly discarded and replaced when:
- The user detects a warning property such as odor, eye or nasal irritation; or
  - The user experiences difficulty breathing or shortness of breath; or
  - The cartridges appear defective or damaged.
- g. At termination, all used cartridges shall be discarded.

### **5.3 Use of PASS Devices/Alarms:**

### **5.4 Use of Other Equipment at Hazmat Incidents:**