

10010.01

HAZARDOUS MATERIALS RESPONSE POLICY & PROCEDURES



This policy is for internal use only and does not enlarge an employee's civil liability in any way. The policy should not be construed as creating a higher duty of care, in an evidentiary sense, with respect to third party civil claims against employees. A violation of this policy, if proven, can only form the basis of a complaint by this department for non-judicial administrative action in accordance with the laws governing employee discipline.

Applicable HI Statutes:

OSHA: 29 CFR 1910.120; NFPA Standard: 472, 1991, 1992

I. PURPOSE

The purpose of this policy is to establish accepted actions governing the response of Hawai'i Fire Department (HFD) personnel for emergency response to hazardous materials incidents.

II. APPLICABILITY

This policy shall apply to all HFD personnel certified and trained to respond to a hazardous materials incident as part of their normal duties. The extent of involvement at a hazardous materials incident will be dependent upon their level of training.

III. PREFACE

The Hazardous Materials Response Policy and Procedures (P&P) is Article 3 of the Hawai'i Fire Department (HFD) Policy and Procedures manual. The Hazardous Materials (HazMat) Response (P&P) is aligned with federal, state, and county laws, rules and regulations, as well as various employee collective bargaining contracts.

The HazMat Response (P&P) may not provide a solution to every question or problem that arises in an organization established to provide emergency service to the public. It is, however, sufficiently comprehensive to cover the responsibilities and duties of the members of this department inclusive of First Responder Operations level responders and the HazMat companies.

This manual is not designed nor intended to limit members in the exercise of their judgment or initiative in taking actions of reasonable persons in extraordinary situations. It is understood that in some situations decisions must be made based on training and experience.

Amendments and additions approved by the Fire Chief will be issued as necessary. It shall be the responsibility of HazMat company members to keep their copy current. In the event that pages are lost, torn, or illegible, copies of these pages may be obtained from the HFD server.

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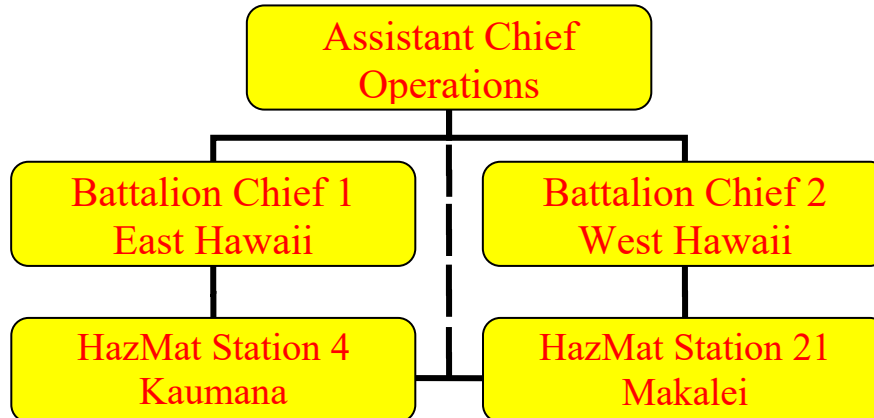
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I. SPECIAL OPERATIONS

The Special Operations Bureau shall be in Fire Operations and shall include the two Rescue companies, the two HazMat companies, and the Ocean Safety Division.

Section 1: Administrative Roles and Responsibilities



1. The Assistant Fire Chief of Emergency Operations (AC-1) is responsible for the daily administration of the Ocean Safety Division, and Specialized Administrative oversight of the Rescue (2 & 7), and Hazmat (4 & 21) companies.

Responsibilities for these include:

- a. Maintaining the HazMat SOP
- b. Maintaining other procedures that apply to the Sp-Ops companies
- c. Overseeing and/or coordinating training and development for the companies
- d. Serving as the liaison between the HFD and other agencies in regard to Special Operations issues at the administrative level
- e. Evaluating, inventory oversight, and procurement of specialized equipment
- f. Conducting special projects

2. The Operations Battalion Chiefs (BC) are responsible for the daily management of their respective battalions. Their responsibilities for the Special Operations companies include but are not limited to, the oversight and management of all day to day administrative and operational needs comparable to any other Fire Company, to include:

- a. Direct oversight at all emergency incidents
- b. Personnel time and attendance tracking, including any type of leave
- c. Daily manpower
- d. Monthly, incident, and personnel reports

HFD forms are located in the all battalions- Templates or Operations folder.

3. The HazMat Station Commanders will be the designated point of contact (POC) between their respective stations and AC-1.
4. The HazMat Captains are responsible for the daily operations and training including completing the necessary HFD forms and paperwork required for administrative and incident documentation.

II. OPERATIONS

Section 2: Authority for Hazardous Materials Operations

The Charter of the County of Hawaii authorizes the Fire Chief and his designated members to perform emergency services for the community during times of disaster and danger. At times members of HFD are called upon to respond to incidents involving hazardous or biological substances, materials, and/or waste. The County of Hawaii Emergency Operations Plan (EOP) designates the roles and responsibilities of the various County agencies based upon the authority of the County Charter.

HazMat training, handling, storage, and transportation is heavily regulated by the federal government. The Resources Conservation and Recovery Act (RCRA) of 1976, which regulates the disposal of both solid and hazardous wastes, was the first federal act to address these issues. In 1980, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) was passed to protect public health from hazardous waste. As additional issues regarding responder health and safety developed, the Superfund Amendments and Reauthorization Act Title I, Section 126, was enacted to require the Occupational Safety and Health Administration to establish regulations regarding emergency response to hazardous substances. This, in turn, led to the Hazardous Waste Operations and Emergency Response, 29 CFR 1910.120 regulations.

29 CFR 1910.120 was the first regulation to establish minimum levels of emergency responder skills, knowledge, and functional levels to meet the safety and health needs of response personnel. Environmental response procedures are also governed by HRS Chapter 128D, known as the Hawaii Environmental Emergency Response Law.

The Office of Hazard Evaluation and Emergency Response (HEER) within the State Department of Health provide support to the HFD’s first responders during an oil or hazardous material incident. The HEER can provide direct support with environmental monitoring, assistance in health and environmental matters, resolution of technical problems, and serve as a liaison to the Federal Government, as required. Some of the responsibilities of the State of Hawaii Department of Health towards environmental response are:



1. Assigning a State-on-Scene Coordinator (OSC) to the emergency. OSC's are available for response 24 hours a day, 7 days a week.
2. Assist the Incident Commander (IC), as needed.
3. Determine and designate the responsible party.
4. Address public health issues and concerns.
5. Establish site restoration standards.
6. Cost recovery procedures.

When there is no identifiable responsible party, the State is responsible for the cleanup, removal, and remediation of hazardous material releases.

Additional administrative rules are listed in HAR Title 11, Chapter 451. These rules can be found at the State Department of Health website.

Section 3: Hazardous Materials Technician

Hazardous Materials Technicians (HMT) must meet the requirements listed below. HMTs respond to or potential releases of HazMat for the purpose of controlling the release. HMTs may approach the point of release to plug, patch, contain or otherwise stop the release of a hazardous substance. HMTs are expected to use specialized chemical protective clothing, monitors, and control equipment to mitigate an emergency.

1. Training and Certification
 - a. HMTs shall be trained to meet all requirements of the first responder at the awareness and operations/decontamination level and the technician level criteria listed. In addition to the training and certification standards, HMTs shall provide medical surveillance, in accordance with requirements of Federal Occupational Safety and Health Administration (OSHA), Hawaii Occupational Safety and Health (HIOSH) or United States Environmental Protection Agency (EPA), as appropriate.
 - b. Initial Training. HMTs shall meet the minimum levels of training, as listed in OSHA 29 CFR 1910.120 (q)(6)(iii), and the employer shall certify that in addition to the Awareness and Operations/Decon Levels of training, the HMTs has the competency in the following areas:
 - 1) Know how to implement the Departments' emergency response plan.
 - 2) Know the classification, identification, and verification of known and unknown materials by using the field survey instruments and equipment.
 - 3) Know how to function within an assigned role in the ICS.
 - 4) Know how to select and use proper specialized chemical personal protective equipment (PPE).
 - 5) Understand the hazard and risk assessment techniques.



- 6) Know how to perform advance control, containment, and/or confinement operations within the capabilities of the resources and PPE available assigned to the company.
 - 7) Understand and implement decontamination procedures both for technical and emergency decontamination.
 - 8) Understand incident termination procedures.
 - 9) Understand basic chemical and toxicological terminology and its behavior.
- c. In addition to the minimum OSHA standards, the Department shall utilize the training standards listed in the National Fire Protection Associations (NFPA) Standard 472 (2008), Chapter 6, HMT. In general, NFPA 472 training objectives compare in scope to those minimally required by OSHA. The NFPA 472 does not constitute an increased level of training, but rather provides a greater depth of definition towards training objectives. This greater depth of training is usually provided in two 80 plus-hour courses, one dealing with the in-depth study of HM chemistry and the second dealing with tactical use and deployment of chemical protective clothing, monitoring equipment, leak and spill techniques, chemical reference sources, scene operations, and management.
- d. Recurrent Training. HMTs shall receive annual recurrent training of sufficient content and duration to maintain their competencies, or shall demonstrate competency in those areas. A statement shall be made of the training or competency and the Department shall keep a record of the methodology used to demonstrate competency. The annual recurrent training shall include:
- 1) Annual Department training
 - 2) HM exercise participation
 - 3) Company drills
 - 4) Delivery of HM Operations level training – Initial and recurrent HM Operations level training shall be the responsibility of the HM company. Specific material will be provided in consultation with the Special Operations BC.
- e. Specialized Training: HMTs shall be afforded the priority to attend specialized training available in the form of conferences, seminars, and workshops that include, but are not limited to, such topics as, Weapons of Mass Destruction (WMD) (chemical, biological, nuclear, explosives, incendiary), confined space, HM storage-handling-transportation, scene management, HM substance specific, and emergency planning.
2. Qualifications



- a. All members who are assigned to a HM Company or assigned to perform technician related duties must maintain a current Department's competency and certification as an HMT, along with the appropriate medical monitoring program.
- b. Company members shall maintain a physical condition that allows them to consistently pass a pre-entry medical screening for heat stress and elevated vitals. If team members fail a pre-entry medical screening, they shall be allowed appropriate time to rehabilitate and improve their physical condition, so as to once again, consistently pass a pre-entry screen.
- c. A medical surveillance program meeting the requirements of 29 CFR 1910.120 shall be established for each HMT prior to assignment to a HM Company when duties are performed at the HMT level. Upon termination of assignment to a HM Company, or upon loss of HMT certification, the member shall be provided an exit screening.

Section 4: Cost Recovery

The Hawaii Fire Department (HFD) often responds to hazardous materials emergencies where valuable County resources are used in the process of mitigating the hazardous materials incidents. (12/07) Section 128D of the HRS provides a guideline for the Department to recover costs expended in mitigating a hazardous materials incident through a locally or federally supported process.

1. Definitions.
 - a. Personal protective equipment (PPE) – Equipment issued to HFD personnel to prevent exposure to harmful agents during the performance of their duties.
 - b. Hawaii Fire Department (HFD or Department) – Primary responding agency to hazardous materials incidents on the Island of Hawaii. (12/07)
 - c. Hazardous materials officer – The company commander of a hazardous material company.
 - d. Hazardous materials release – Unintentional release of any substance as defined as hazardous material under the Department of Transportation, Environmental Protection Agency, etc.
2. Cost Recovery Process. There are three processes the Department may go through to request recovery of costs for Department equipment damaged in the mitigation of a hazardous material release. They are:
 - a. A locally supported cost recovery program.
 - b. A state supported cost recovery program.
 - c. A federally supported cost recovery program.

Local Cost Recovery: The first step in obtaining reimbursement for damaged equipment incurred during the mitigation of the hazardous material release is through a locally supported



cost recovery program. This requires the HFD submit a letter to the party responsible for release of the hazardous material requesting reimbursement of contaminated equipment and supplies.

Only condemnable items are reimbursable. Items that can be decontaminated cannot be replaced through this process. The responsible officer shall obtain all information below regarding the incident and submit:

1. Business name and address.
2. Responsible business' contact person.
3. Contact person's telephone number.
4. Business' Insurance Carrier name, address, and contact person.
5. Approximate time of the hazardous material release.
6. Location of the release.
7. Cause of the release.
8. Incident report number.
9. Type of hazardous material released.
10. Estimated quantity of hazardous material released.
11. Was a federal agency (EPA, NRC or other) notified at the time of release?
12. What regional office was contacted?
13. What other agencies were involved?
14. What actions were taken to mitigate the release?
15. Date the response was completed.
16. The type, manufacturer, model number, part number, etc. of equipment contaminated and/or damaged.
17. Type of supplies contaminated.
18. Specify the number of items.
19. Approximate cost of the items. Estimated costs on personal protective equipment and other supplies used can be obtained from vendors. (BC of Special Operations may assist with these estimates)
20. Any other related information to help in accounting for the equipment and identifying the approximate replacement costs. (BC of Special Operations may assist with these estimates)

Note: At no time shall the business representative be pressured into releasing information.

After obtaining the information above, the responsible officer shall forward through channels, to their appropriate Battalion Chief (BC) for the creation of a formal letter on Department letterhead. The letter shall note that it is the business' responsibility to respond in writing or submit a reimbursement check within 30 days after the letter is dated. Also included in the letter shall be the HFD's return address, attention to the Fire Auxiliary Services Officer Battalion Chief (FASO).



The letter shall contain the signature of the Fire Chief. Upon receipt of the reimbursement check, FASO shall enter the receipt of the check into the mail log. FASO shall process the check according to acceptable Department protocol.

If cost cannot be recovered from the business by this method, the HFD shall generate a letter to the State Department of Health stating what has been done and why recovery cost was not obtained. The request for cost reimbursement from the State government funds shall be included in the letter.

State Cost Recovery: When cost recovery cannot be obtained from the business responsible for the release, the HFD may seek to recover costs through the State of Hawaii's Hazards Evaluation and Emergency Response Office (HEER). The FASO shall take the information from the letter previously sent and use it to generate a letter to the State on Department letterhead. It shall identify the equipment damaged and measures taken in trying to obtain reimbursement from the responsible party with help from the responding Company Officer and/or Battalion Chief. The letter shall note that it is the State's responsibility to respond in writing within 30 days after the letter is dated. Also included in the letter shall be the HFD's return address, attention to the FASO.

The letter shall contain the signature of the Fire Chief. Upon receipt of the reimbursement check FASO shall enter the receipt of the check into the mail log. Faso shall process the check according to acceptable Department protocol.

If costs cannot be recovered from the State, the Special Ops BC FASO shall generate a letter to the EPA stating what had been done and why recovery cost was not obtained. The request for cost reimbursement from the Federal government funds shall also include the appropriate federal forms.

Federal Cost Recovery: If recovery of costs cannot be obtained from the State of Hawaii for the release, the HFD may seek to recover costs through the federal government as stated in 42 United States Code, Chapter 103, Subchapter I, and Section 9623 - Reimbursement to Local Governments. This provides a mechanism for local governments to retrieve expenses incurred in measures to prevent or mitigate injury to human health or the environment from the release or threatened release of any hazardous material. The amount compensation shall not exceed \$25,000. This part is authorized by through the Environment Protection Agency under section 123 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (Pub. L. 96-510, 42 U.S.C. 9601-9675), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (Pub. L. 99-499, 42 U.S.C. 9601)

Completion and submittal of the Federal Forms and Routing shall be performed by the Special Ops BC/ FASO with assistance from either the responding Company Officer or Incident Commander. Information provided by the responding Hazardous Materials Officer and Incident



Report shall be used to complete the Federal Application for Reimbursement to Local Governments form and affiliated forms.

EPA's Local Government Reimbursement Hotline (800) 431-9209

EPA Form 9310-1

EPA instructions state that Mayor or highest ranking official needs to sign forms. See Certification and Authorization Section.

The completed forms shall be forwarded to the Fire Chief for signature and mailing the documents to the Federal Government via certified mail. The letter shall include the HFD's return address, attention to FASO. Upon receipt of the reimbursement check the Administration shall enter the receipt of the check into the mail log. The check shall be processed according to acceptable Department protocol.

References:

EPA, Local Governments Reimbursement

<http://www.epa.gov/superfund/programs/er/lgr/index.htm>

EPA's Local Government Reimbursement Hotline (800) 431-9209

EPA Form 9310-1

Section 5: Response Boundaries For Hazardous Materials Companies

For the purpose of emergency response, Fire Communication Control Center (FCCC) will dispatch the assigned Hazardous Materials (HM) Company to any incident.

1. Administrative Boundaries. These boundaries are for the purpose of administrative responsibilities. It provides a guideline for assigning a company to participate in the community service projects, public demonstrations, training activities with fire companies, and pre-planning activities.
 - a. HM 4 - all Districts within the First Battalion.
 - b. HM 21 - all Districts within the Second Battalion.
2. Response Assignments by Incident Type
 - a. Emergency calls dealing with unknown or known releases of hazardous gases, liquids or solids, that include no reported injuries, should have an initial response assignment of the first in district Engine, Medic unit, Hazmat unit, and the Operations BC. Special Ops response as directed by the Operations BC. This type of call may also include initial request for support by law enforcement for clandestine drug operations.
 - b. Emergency calls dealing with unknown or known releases of hazardous gases, liquids or solids that include reported multiple mass casualty type injuries, shall have an



- initial response assignment of the first in Engine company, assigned Medic unit, Hazmat unit, and the respective Operations Battalion Chief. Special Ops response as directed by the Operations BC.
- c. Incidents dealing with victims trapped in confined spaces, initial response shall include the first in Engine Company, Rescue Company, Medic unit, Hazmat unit, and the respective Operations Battalion Chief. Special Ops response as directed by the Operations BC.
 - d. Incidents that an entry in level B or higher chemical protective clothing (CPC) is required, initial response shall include the first in Engine Company, Rescue Company, Medic unit, Hazmat unit, and the respective Operations Battalion Chief. Special Ops response as directed by the Operations BC.
 - e. All of the above incidents may be subject to additional unit response as directed by the Incident Commander or BC on scene.

Section 6: Staffing HazMat Companies

The following are the basic and relief assignments for the HM and back-up Companies. The AC of Operations may authorize changes in the staffing levels when circumstances warrant the change, however any change shall not be in conflict with the existing Collective Bargaining Agreements (CBA).

1. The HM Companies shall have an assigned staffing of 5: Captain, Fire Equipment Operator (FEO), and three FHMS. The above positions may be filled with temporarily assigned personnel in accordance with the existing CBA. Temporarily assigned personnel must possess the Department's certification requirements for a Hazardous Materials Technician (HMT). Only certified HMTs shall be assigned to a permanent or temporary position with the HM Company. If a Hazmat company begins the shift with 5 personnel, they will remain at 5 for the day. However, if they begin the day with the day with 4 personnel, the Operations BC will have the prerogative to keep the manning level at 4 for the day or bring in another certified HMT to keep the staffing level at 5. If the Hazmat company begins the day with less than 4 personnel, the Operations BC shall bring in one or more certified HMTs to keep the staffing level to a minimum of 4 personnel.

Section 7: Hazardous Materials Incident Command System

All HazMat incidents must conform to the National Incident Management System and comply with any Federal and State regulations. Also included are any applicable National Standards.

Section 8: Semi-Annual Training

HazMat companies are tasked with training operations personnel through the Semi-annual Training Program. A semi-annual time span is made up of 6 consecutive months, where one



specific HazMat topic will be presented to the HazMat personnel. SP OPS-1 in coordination with the Assistant Chief of Operations (AC-1) identifies the semi-annual training topic prior to each new term. HM Captains are responsible to schedule, prepare and coordinate the training. Various levels of training criteria are identified and can be accessed through the training division.

Section 9: General HazMat Response Process

These general response guidelines are established for all HM incidents that the Department responds to, whether the situation involves industrial chemical, biological, radiological, or WMD events and they are flexible and comprehensive enough to cover all of these types of situations in a complete and systematic manner.

1. Site Management and Control - In route to the scene, communicate with the first arriving Company, if applicable, and obtain as much information regarding the hazard and situation. Identify the safest approach and placement of the apparatus at the scene.
2. Identify the Hazard
3. Initial Isolation Zones: ERG
4. Hazard and Risk Evaluation
 - a. Estimate the potential harm of the event without intervention, measured in terms of life, property, and the effects on the environment.
 - b. Determine the general behavior of the HM involved
 - c. Determine the basic sequence of events, which are likely to occur, based on the present conditions, predict outcomes
5. Information Management and Resource Coordination
 - a. The HM ICS is to control, coordinate and manage all resources.
6. Implement Response Objectives
 - I. Document the incident action plan (IAP)
 - II. Choose response objectives
 - 1) Rescue
 - 2) Public Protective Actions (refer to Public Protection Guidelines (PPG) later in this section).
 - 3) Containment
 - 4) Sampling, if necessary, shall be conducted using the appropriate sampling kit and protocol, labeled with the forms and the Chain of Custody, and transferred to the State On-Scene Coordinator, if available. Samples are sent to the appropriate testing facility:



- (a) DOH State Laboratories Division, located in Pearl City for biological samples
- (b) University of Hawaii, Environmental Health and Safety, Laboratories for chemical samples
- 5) Recovery
- 6) Appropriate Personal Protective Equipment (PPE) for the task

III. Establish Hazard Control Zones: The following control zones will be established: Hot, Warm, and Cold zones. These zones will have progressive levels of restricted entry.

IV. Decontamination

- a. Emergency decon of victims
- b. Technical decon of HM entry teams

V. Terminate and demobilize

- a. Terminate the incident if appropriate or turn over to the responsible party.
- b. Brief members regarding outcomes, exposure information and follow up actions.
- c. Ensure incident information is available for proper documentation and finalization.
- d. Incident Commander (IC) shall ensure a Post Incident Analysis is conducted.

Section 10: Hazardous Materials Response Levels

Size-ups at hazardous materials incidents shall be reported as one of three levels and an incident description shall be given to the FCCC (dispatch).

1. Level 1 – Potential Emergency Conditions A release or threat of a release, which can be controlled by the first-in engine company and does not require evacuation of other than the involved structure or the immediate outdoor area. This incident is confined to a small area, does not pose an immediate threat to life or property, and requires only minimal clean up.
2. Level 2 – Limited Emergency Conditions An incident involving a greater hazard or larger area which poses a potential threat to life or property and which may require a limited evacuation or in-place sheltering of residents of the surrounding area. Clean up usually requires a contractor.
3. Level 3 – Full Emergency Conditions An incident involving a severe hazard or a large area which poses an extreme threat to life and property and will probably require a large-scale evacuation: or an incident that requires the expertise or resources of City, State, Federal and institutional agencies/organizations.

**Section 11: Odor of Gas or Chemical Response**

1. Locate source or hazard
 - a. Systematically use PH paper, radiological check and then utilize gas monitors
 - b. Start upwind working towards the area of possible hazard
 - c. Ventilate if enclosed in a structure
 - d. Monitor CH₄ readings for elevation of LEL %
 - e. Monitor change in O₂ readings
 - 1) Normal level: 19.7% - 23.0%
 - 2) O₂ displacement may suggest presence of another gas when O₂ level decreases
 - f. Control Ignition Sources
 - 1) Cut electricity from outside the structure to avoid arcing, if applicable.
 - 2) Use equipment that is intrinsically safe.
 - 3) Visual hand signals maybe necessary for communication within the hot zone.
 - 4) Avoid any actions that could cause an electrical arc within the hot zone.
 - 5) Do not allow any vehicles or electrical equipment into the hot zone
 - g. Survey the hazard area and stabilize - Look for the presence of sewer lines within the vicinity. Probe ground for leaks with gas monitors. Examine appliances, tanks, or pipes for leaks with gas monitors. Check pocketing areas, storage and closets

Section 12: Confined Space

For any incident involving a possible confined space condition, the respective HazMat Company shall be dispatched to the incident. Any additional resources will be dispatched as directed by the Operations BC (IC).

The following are the primary responsibilities of HazMat Companies at a confined space incident:

1. Air Monitoring
 - a. Monitoring in and around the confined space
 - b. Monitoring for high oxygen atmospheres, flammability, and toxicity.



- c. No entry shall be made into a confined space until it is determined by monitoring that any flammable or combustible gases in the confined space are less than 10% of their LEL
- d. Where air contaminants persist or begin to appear after ventilating a confined space, continuous air monitoring will be performed. The information will be recorded every 15 minutes.

2. Ventilation

- a. The confined space shall be emptied, flushed or otherwise purged of flammable, injurious, or incapacitating substances to the extent feasible
- b. If air contamination exists, spaces shall be ventilated for at least 15 minutes prior to entry using the most effective method. Entry for rescue purposes may be prior to ventilation if the entry supervisor deems it an emergency.
- c. Adequate ventilation will be provided to protect members from dangerous working conditions resulting from accumulation of hazardous concentrations of flammable vapors, toxic gases, or an oxygen deficient or enriched environment in all confined space work.
- d. The intrinsically safe Portable Ventilation Blower shall be used to purge the confined space of airborne contamination.

Section 13: Spill Mitigation

The Department maintains and operates a variety of spill mitigation equipment for the containment, control, and collection of various chemical substances. The following section provides use and maintenance guidelines to keep this equipment in operational response status.

The following is a listing of absorbent materials utilized by HFD HazMat Companies:

1. Absorbent Pads – are for use on oil and petroleum products. Since they don't absorb water, they can be used on land or water.
2. Chemical Absorbent Pads – are for use on acids, bases or unknown liquids. They are not for use on petroleum products.
3. Booms - They can be used to contain and control spills on land or water. They are a long round cylindrical pad packed with a variety of absorbent material capable of addressing two general categories of spills.
 - a. Petroleum Products
 - b. Chemicals Products – acids, bases, solvents
 - c. Or both petroleum and chemicals
4. Socks - Use on land only to confine (dike) and absorb liquids. Depending on the absorbent material used in the sock, it may be used to address:



- a. Petroleum products, excluding water
 - b. Other chemicals – acids, bases and solvents
 - c. Or both petroleum and chemical products
5. Pillows - is shaped like a pillow and has the same capabilities as a sock. Pillows are thrown into the spill area.
 6. Granular Absorbent – used for absorbing petroleum products and liquids. Proper PPE should be used when applying absorbent.

Section 14: Leak Control/Containment

Response Kits – are various plugs, patches, screws, and tools carried on the apparatus and used for emergency and temporary stoppage of liquid or bulk hazardous material leaks. The causes may be due to puncture, gashes, cracks or surface rotting in most of the common containers such as, drums, cans, tank trucks, cars, gasoline tanks, and storage tanks.

The following are some general guidelines to keep in mind regarding response kits:

1. These kits are intended for temporary control and containment, the containers or the contents of containers shall be transferred to other vessels as soon as possible.
2. Items made of rubber may deteriorate when exposed to petroleum-based products.
3. Items made of neoprene are oil resistant.
4. Plugs and patches shall be used once and then discarded.
5. Metal screws and tools may be washed with soap and water or chlorine bleach then dried and reused.

Response Kit Types:

1. Chlorine A and B Kits - Standardized leak control kits used for the control of leaks in chlorine cylinders
 - a. Chlorine A – for 100 to 150 # Chlorine cylinders
 - b. Chlorine B – for 1 ton Chlorine containers
2. Pipe Clamps - Various sizes of stainless steel sheet metal with a neoprene or rubber liner used to stop leaks in pipes. One or two bolts are used to tighten clamp to pipe.
3. Repair Putty - A pasty substance used to stop leaks in materials made of steel, glass, masonry, and most plastics. The malleable putty is generally kneaded and applied to a hole or gash to halt leak. Upon drying forms a hard cover.
4. Plug-n-Dike - Granular substance that when mixed with water and that can be applied to holes on surfaces to stop leaks. The pressure of the liquid cannot be more than two-to-three-pounds for proper adhesion.

**Section 15: WMD CBRNE Response**

Weapons of Mass Destruction (WMD) Chemical, Biological, Radiological, Nuclear, Explosive (CBRNE) events may result in mass casualties and destruction of major infrastructures. Responders shall always keep in mind the safety of response members while operating at such an incident. Specific information on WMD is found under separate cover in Chapter 5, Article 7 Weapons of Mass Destruction Standard Operating Guidelines.

Operations Companies responding to a potential WMD terrorist incident shall:

1. Establish command and begin size-up. Priorities are LIP. The incident shall be treated as a biological or chemical incident until information indicates otherwise.
2. Respond in full structural fire fighting turnout gear and don additional appropriate protective equipment when arriving at the scene of the incident.
3. Establish an isolation zone, secure the perimeter and deny entry. If the incident is in a building, shut down the HVAC to avoid spreading contamination. Be aware of the possibility of secondary devices
4. Position equipment uphill, upwind from the event.
5. Assess downwind hazards – and initiate appropriate action of evacuation or shelter-in-place.
6. Do not use the specific name of the suspected agent over the radio, use only “unknown agent” or “unknown material”.
7. Use the PA system to inform victims on the plan:
 - a. Instructions on emergency decontamination
 - b. Safe refuge area
 - c. Location to stage after decontamination

ICs at a potential WMD terrorist incident shall:

1. Institute the HM ICS to manage the incident.
2. Conduct scene assessment to determine if the incident is a CBRNE terrorist incident. This may be done through dispatch information, scene observations, interview, and physical materials or substances observed at the scene.
3. Identify the nature of the problem and necessary actions that need to be implemented, and relay this information to the Fire Communication Center (FCC)
4. Ensure personnel are properly protected and adequate isolation zones have been designated to protect personnel and the general public when the scene assessment warrants such actions.
5. Notify the FCC of additional resources needed at the scene as well as actions conducted at the scene by personnel.



6. Evaluate the actions taken at the scene during the incident as well as after the incident has terminated.

HazMat Company at a potential WMD terrorist incident shall:

1. Delineate the hot, warm and cold zones and equipment positions
2. Reassess downwind hazards
3. Assign levels of PPE
4. Direct technical decon set-up
5. Prepare entry team and back-up team

Response to a suspicious package or envelope that is closed or sealed with no evidence that a CBRNE agent has been released shall include:

1. Engine Company
2. Advanced Life Support Medical Unit
3. Hazardous Materials Unit
4. Battalion Chief

Hazardous Materials Unit shall:

1. Prior to entering the area, the package or envelope shall be screened by the EOD for explosives. No further action shall be taken by HFD until the package or envelope has been declared free of explosives.
 - a. The entry team shall be donned in appropriate protective equipment and self-contained breathing apparatus (SCBA) or proper respirator when provided
 - b. Upon completion of the explosive assessment, the HazMat Company shall perform a radiological screening prior to opening the letter, package or container. If a radiological assessment indicates a reading of twice background or greater, secure an isolation area at 2mR/hour or less and notify the DOH Radiological Response Team and the HEER Office.
 - c. Digital pictures of the immediate area and of the parcel will be taken once the radiological hazard has been ruled out.
 - d. If it is determined that a sample is required from a sealed envelope, refer to Par. 5-09.03.800 IsoBag Guidelines retrieve sample following sampling guidelines.
 - e. If there are no unusual levels of radioactivity, the entry team shall double bag the suspicious envelope in clear Ziploc bags or package and place it in an over pack container. Refer to Par. 5-09.02.700 for transportation guidelines.



Response to a suspicious package or envelope that is open or closed, and where there is evidence that a CBRNE agent has been released, shall include:

1. Engine Company
2. Advanced Life Support Medical Unit
3. Hazardous Materials Unit
4. Battalion Chief

Hazardous Materials Unit shall:

1. Prior to entering the area, the package or envelope shall be screened by the EOD for explosives. No further action shall be taken by HFD until the package or envelope has been declared free of explosives.
2. The entry team shall be donned in appropriate protective equipment and SCBA or proper respirator when provided.
3. Upon completion of the explosive assessment, the HazMat Company shall perform a radiological screening prior to opening the letter, package or container. If a radiological assessment indicates a positive event, secure an isolation area at 2mR/hour or less and notify the DOH Radiological Response Team and the HEER Office.
4. If there are no unusual levels of radioactivity, the entry team shall conduct a field test with provided equipment and complete the Field Screening Checklist form. Presumptive field tests should be done for biological and/or chemicals where appropriate.
 - a. If the manual presumptive field test is negative, the incident should be classified as not a credible threat and the following steps should be taken:
 - 1) No technical decontamination for exposed individuals.
 - 2) Information communicated to exposed individuals at the scene that the field test was negative for the biological and/or chemical agent being tested.
 - b. If the manual presumptive field test is positive, a second test may be conducted to verify the manual field test; and the incident shall be treated as a credible threat. The following steps shall be taken:
 - 1) The Hazard Emergency Evaluation Response (HEER) office shall be notified by the FCC that an On-Site Coordinator is needed at the scene.
 - 2) The HEER On-Site Coordinator shall notify the Federal Bureau of Investigation (FBI) once the incident is determined to be a credible threat.
 - 3) A sample shall be taken by the entry team and double bagged. The sample shall be taken out of the hot zone and decontamination procedures conducted. The HFD (Field Screening Checklist for Suspected Packages/Containers) form shall be completed.
 - 4) Refer to Par. 5-09.02.700 for transportation guidelines.



- 5) The scene shall be secured by the HPD until laboratory test results are received.
- 6) The HEER officer shall arrange for the mitigation of the infected area.

Response to a suspicious package or envelope that is open and there is no evidence that a CBRNE agent may have been released shall include:

1. Engine Company
2. Advanced Life Support Medical Unit
3. Hazardous Materials Unit
4. Battalion Chief

The incident shall be classified as a good intent incident and information gathered, including the name and badge number of the HPD representative and the HPD report number by the IC prior to leaving the scene.

Section 16: CBRNE Transfer of Samples

The Hazardous materials unit may transport a closed sample that is determined not to be a credible threat and shall:

1. Ensure that the sample is double bagged.
2. Transport the sample to a site or vendor in consultation with the HEER office.
3. Ensure that the HPD's incident number is recorded on the HFD-Incident Report.
4. Ensure that the hazardous materials unit completes the HFD- form and the State of Hawaii Department of Health Environmental Health Administration's Chain of Custody Record form.
5. Ensure that copies of the forms accompany the sample(s) to the site or vendor designated by the HEER office.

For a sample that is determined to be a credible threat:

1. Ensure that the sample is double bagged and decontaminated.
2. The authorized vendor of the HEER/ DOH office shall pick up the sample to transport to the designated diagnostic test site.
3. Ensure that the HPD's incident number is recorded on the HFD Incident Report.
4. Ensure that the hazardous materials unit completes the State of Hawaii Department of Health Environmental Health Administration's Chain of Custody Record form.
5. Ensure that copies of the forms accompany the sample(s).



Prepare all sampling equipment



Example of twist, tape, ponytail



Using the Isobag to sample

**Section 17: CBRNE Notification Information**

ICs need to communicate the following information to the FCC prior to leaving the scene of the incident:

1. Name and phone number of any exposed individuals when reasonably possible.
2. Destination of any exposed individuals being transported from the scene by Emergency Medical Services for medical treatment.
3. HPD incident report number for all incidents where samples are being transported from the scene.
4. Results of presumptive field tests that were conducted at the incident.
5. Determination if the incident is a credible threat or a non-credible threat.

Section 18: Entry Operations

Entry guidelines are established to identify procedures that shall be performed to ensure the safety of personnel making entry to the hot zone of all hazardous materials incidents.

Protection Levels:

1. Chemical Protective Clothing (CPC) selection shall be based on the potential hazard posed to the entry team, compatibility of the CPC to the hazards (according to the manufacturer's specifications) and the goals and objectives of the entry team.
2. The Incident Commander (IC) shall have an Incident Action Plan, Site Safety Plan, Rapid Intervention Team (RIT), and Technical Decon in place before entry into the hot zone.
3. All on-site personnel shall be alert to malicious or unforeseen hazards and report these hazards to their section leader as soon as possible.
4. Suiting of the entry team shall be done in a safe area, protected from the sun, and away from vehicle exhaust, noise, and distractions. An area in close proximity and line of site to the entry corridor, hot zone and command structure is ideal but not essential.



5. Appropriate ground cover shall be used to protect the CPC and seating provided for the entry team members.

Rapid Intervention Team (RIT):

1. RIT shall be established in accordance to NFPA Standard 472.
2. HazMat RIT personnel shall be trained to the Technician Level in accordance with NFPA Standard 472. They shall also have a working knowledge of equipment use and location for items specific to the HazMat units.
3. RIT shall be alert to the entry team's mission progress and objectives. They shall be ready for immediate entry, suited up to donning their mask, helmet, and zip up, standing by for final briefing by the Entry Team Leader

Medical Monitoring:

Within one hour prior to the entry operations, all members assigned to make entry, decon and perform the RIT shall pass a medical monitoring criteria established by the State of Hawaii's Department of Health.

1. Members who do not meet the medical monitoring criteria will not be allowed to operate in CPE.
2. Members making entry shall be medically monitored and appropriately rehabilitated immediately following decontamination and doffing of CPE.

Communications:

1. Whenever possible an assigned frequency shall be established for entry operations.
2. Each HazMat Entry Team Member shall be equipped with a radio and a radio check performed prior to entry into the hot zone.
3. Each Entry team member shall be familiar with hand signals as a back up means of communications.
 - a. Hands gripping throat Out of air/Breathing
 - b. Grip partner's wrist Leave area immediately
 - c. Hands on waist Leave area immediately
 - d. Hands on top of head Need assistance
 - e. Thumbs up I'm OK/I understand
 - f. Thumbs down I'm not OK



4. The EO prior to enclosing the personnel in their CPC, shall give a pre-entry briefing to entry members up. Issues covered shall include:
 - a. Situation summary
 - b. Goals and objectives
 - c. Tactics
 - d. Site layout
 - e. Anticipated hazards and exposures
 - f. Back up plans
 - g. Secondary exit route and/or safe refuge

5. Entry teams shall make timely reports on their mission progress and report any changes of mission objectives or unusual occurrences to the EO. Reports by radio to the EO shall include:
 - a. "Making Entry"
 - b. "At work zone"
 - c. A size up and casualty report
 - d. Any change in tactics agreed to in pre-entry briefing
 - e. Alarming of a PASS device
 - f. Missing or down member
 - g. Suspicious circumstances
 - h. "Leaving work zone- ready for Decon"

6. Entry Team Leader shall perform periodic time checks to inform Entry team members of their "Time On Air".

7. Entry teams shall, at all times, be cognizant of possible improvised explosive device (IED), secondary explosive devices (SED), anything unusual, out of the ordinary or out of place.
 - a. If IED or SED is discovered, do not move any further into the hot zone.
 - b. Do not transmit information over the radio.
 - c. Utilize hand signals for communication between team members and command.
 - d. Leave area immediately

8. Mission Abort Criteria – Entry team shall evacuate the hot zone if any of the following circumstances occur:
 - a. Team member down or injured
 - b. Equipment or PPE failure
 - c. Identified IED or SED
 - d. Loss of communications with team member or entry officer



- e. Fire or explosion
- f. Emergency occurs in the hot zone

Mitigation:

1. Mitigation shall be accomplished using methods consistent with NFPA Standard 471 section 6-4.
 - a. Mechanical methods
 - b. Absorption, covering, dikes, dams, diversions, retentions, dilution, over pack, plug/patch, transfer, vapor suppression (blanketing), vacuuming, and venting
 - c. Chemical methods
 - d. Adsorption, burn, dispersion/emulsification, flare, gelatin, neutralization, polymerization, solidification, vapor suppression, vent/burn
2. Once the situation is under control, the IC can release the scene to the responsible party for the recovery phase, clean up of the incident. The State DOH/HEER - On Scene Coordinators (OSC) are available 24-hours a day, seven days a week to assist with emergency response agencies and determine the responsible party.
3. Requests for additional resources shall go through the Fire Communications Center in accordance with the County's Emergency Operating Plan. Agencies available to provide assistance are:
 - a. Coast Guard for spills and leaks in the ocean, streams, and storm drains.
 - b. Clean Island Council, for spills in the harbor.
 - c. DLNR/ DOFAW
 - d. County of Hawaii and State of Hawaii Employees.
 - e. HEER for arrangements for site clean up/restoration by private contractors.
 - f. Military for explosive ordinance disposal.
 - g. Hawaii Police Department for bomb investigation and scene control
 - h. CST and FBI for WMD and terrorism
 - i. State's Department of Health's Radiation Branch and the Nuclear Regulatory Commission (NRC) for radiation issues
4. In accordance with State law, the HazMat Captain shall report all spills deemed "Reportable Quantity" to the State's Department of Health (DOH).
5. Samples collected using DOH sampling kits by the HFD HazMat teams shall be stored with chain of custody documentation, appropriate labeling and containment, and transported or transferred to the appropriate agency for analysis in a laboratory. The State Laboratory Division is for biological samples and the University of Hawaii's Environmental Health and Safety Laboratories is for chemical samples.



6. Contaminated materials, product, container, runoff water, clothing, and disposable supplies, tarps, decon pools, disposable PPE shall be left at the scene for the property owner or responsible party to dispose of appropriately. An accounting shall be made of the disposed items so that reimbursement can be pursued.
7. Replacement of disposable supplies, tarps, pools, gloves, boots, suits and any other equipment that needs replacing shall be issued by the Department's Storeroom ordered thru Special Ops BC/ FASO.
8. Appropriately labeled and contained contaminated equipment shall be held until decontamination or disposal issues are addressed.

Section 19: Air Monitoring At HazMat Incidents

Monitoring is to be performed when compelled as an emergency response agency to respond to an emergency resulting from a non-permitted or suspected release of hazardous materials. Monitoring shall be initiated for Site Characterization, which includes adverse environmental and/or human health and safety issues.

The objective of air monitoring during response is to identify and quantify airborne contaminants on and off-site and monitor the changes in the air contaminants over the life of the emergency.

The data obtained is used to help establish criteria for worker safety, document potential exposures, determine protective measures for the public, evaluate the environmental impact of the incident, and determine mitigation necessity/ activities.

Initial Monitoring:

Shall be performed to determine whether the following conditions exists and, if so, their location at the emergency scene in accordance with CFR 29 1910.120(c)(6).

1. Toxic or corrosive atmospheres
2. Potential for ionizing radiation
3. Existence of IDLH conditions
4. Combustible or explosive atmospheres
5. Oxygen deficiency (< 19.5%) and/ or oxygen enriched (> 23.0%) atmospheres

Periodic Monitoring - Shall be performed when any of the following conditions arise:

1. The possibility of an IDLH condition or a flammable atmosphere has developed.
2. There is an indication that the atmospheres may have raised over Published Exposures Levels (PEL) since prior monitoring.
3. When work begins on a different portion of the site.
4. When contaminants other than those previously identified are encountered.
5. When a different type of operation is initiated.



6. When employees are handling leaking drums or containers or working in areas with obvious liquid contamination.
7. Any time air purifying respirators (APR) are worn.
8. As required for confined space operations.
9. Weather changes, wind, humidity, and temperature changes greater than 10 degrees.

Location of Monitoring sites:

Determination of hazard areas by air monitoring will assist the Incident Commander in the decision making process for evacuation and/or mitigation of a hazardous materials release.

1. Background. Many hazardous incidents occur near industries or highways that generate air pollutants, therefore, samples must be taken upwind of the site to establish background levels or a baseline of air contamination.
2. Cold Zone/Support Zone. The command post, staging and other support personnel, which make up the support zone, shall be located in the cold zone.
3. Downwind/Perimeter. Those areas downwind and /or those areas that are the perimeter of the cold zone.
4. Plume Edge. To validate a computer generated plume model.

Threshold Limit Value (TLV) - Atmospheres that have concentrations of chemicals in air that almost all healthy adult workers are predicted to be able to tolerate without adverse effects.

The following are TLV for monitoring high rise fire scenes:

1. Oxygen < 19.5%
2. Carbon Monoxide 25ppm

Selection of appropriate equipment

1. Use and selection of appropriate monitoring equipment should be determined by identification of the product either through pre-plans, occupancy type, container shape or sizes, placards or labels, MSDS sheets, or various types of shipping papers.
2. If identification of the product is not possible checks should be done for the following:
 - a. Corrosives (PH)
 - b. Radiation
 - c. Oxygen, enriched or deficient
 - d. Below 19.5%, monitor using SCBA
 - e. Greater than 23%, fire hazard potential
 - f. Flammability
 - g. Carbon Monoxide (Fire incidents)



3. Prior to using any monitors, the atmosphere shall be assessed in the following order for:
 - a. Corrosives
 - b. Radiation

Section 20: Air Monitoring At Building Fires

Breathing the toxic gases resulting from a fire is one of the most common causes of fire deaths. In order to protect both civilians and fire fighters that are without SCBA, it's important to ensure designated areas are free of toxic gases.

The most common toxic gasses found at fires which should be considered for monitoring, are carbon monoxide (CO), hydrogen cyanide (HCN), and carbon dioxide (CO₂). The reduction of oxygen levels due to the fire is also an area that should be monitored.

At any building fire in which a staging area is established, at the discretion of the IC an Air Monitoring Group (AMG) may be implemented. It will be the responsibility of the AMG to determine if the quality of the ambient atmosphere is within accepted standards to function in without a SCBA. Geographical areas of concern that may require air monitoring may include, but are not limited to some of the following:

1. Staging Area - The AMG shall assist the Staging Leader (SL) in establishing an environment that will allow the personnel in the staging area to safely remove their SCBA. The AMG with his personnel shall use toxic gas monitors to characterize that the air quality is within the limits established by OSHA. Focus should be on carbon monoxide and oxygen levels in this area. Carbon monoxide levels shall not exceed the OSHA PEL (35ppm). Oxygen levels shall not fall below 19.5% in air. Should any of these or other conditions occur the AMGL shall inform the SL and advise him to relocate the Staging area to a location with better conditions. Periodic monitoring of this area will be conducted as needed, determined by the AMGL.
2. Shelter in Place Locations - Upon being assigned the task of monitoring air quality for civilians who are sheltered in place, the AMG shall assign personnel to assess areas that are occupied by civilians. The air quality shall be within the limits established by ACGIH (the American Conference of Governmental Industrial Hygienists) TLV levels for carbon monoxide (25 ppm). Should conditions in any category be above or below the recommended limits, an evacuation to an area where conditions are better shall be commenced with the IC being notified. Periodic monitoring of this area will be conducted as needed.
3. Rehabilitation Area - An area safe from products of combustion and effects of the fire should be established for the Rehabilitation Area. The rehab area will be determined by the AMGL to be at or below TLV levels for carbon monoxide (25ppm) and above 19.5%



oxygen in air. An initial determination of the air quality in the rehabilitation area will be conducted once the location and function has been activated.

4. Air Quality Determination upon Termination of Incident - Upon termination of incident and before allowing building occupants to return, the AMG will with his personnel determine the levels of carbon monoxide and oxygen levels in air on the fire floor, 3 floors above and 3 floors below. The air quality shall be within the limits established by ACGIH TLV levels for carbon monoxide (25ppm) and above 19.5% oxygen in air. Should any floor need to have the air quality improved, AMG shall inform Ops that the Ventilation Group (VG) will need to ventilate the area to either bring up the oxygen content and/or reduce the carbon monoxide content.
5. Areas identified by the IC

Section 21: Decontamination

The Department recognizes two decontamination processes; emergency decon and technical decon. As identified in the HM ICS, Emergency Decon, which includes emergency mass decon is normally a function of Fire Operations' Companies. Technical Decon falls under the direction of a Decon Officer under the HazMat Group Supervisor in the ICS.

The objective of any decontamination process is to reduce the level of contamination of personnel, victims or equipment to below detectable levels when using field-monitoring equipment.

Section 22: Emergency Decontamination

Emergency decontamination may involve victims or Department members and equipment exposed to hazardous materials at an incident and must be decontaminated immediately due to critical health issues.

The effluent from this process, according to federal law, need not be contained and disposed of. It may be allowed to run into storm drains, sewers, or natural landscape without fine or penalty. This allows flexibility in the techniques used for applying the emergency decon process. Note: Try to avoid storm drains and sewers if at all possible.

Emergency Decon Objectives:

1. Identify, prevent spread, and remove contaminant
2. Triage and treat victims
3. Patient stabilization
4. Transfer patients to EMS

Emergency Decon Considerations:



1. A rapid and aggressive “Trench Drench” in accordance with recommended flush times of the involved chemical from the ERG or HazMat Unit is a very effective initial tactic to address exposed victims. If no technical resources are available at the scene, the general rule of thumb is to flush the exposed victims with water for a minimum of 15 minutes.
2. Victims must be controlled and accounted for.
3. Criminal evidence shall be preserved and left undisturbed.
4. Emergency decon is manpower and equipment intensive process.
5. Response personnel must use the appropriate level of PPE for the job they are performing.
6. Sensitivity to gender and modesty issues must be addressed when outer garments are removed for decontamination purposes. Provisions for the separation by gender and shielding from the public must be taken into consideration and reasonable accommodations implemented.
7. Decontamination solutions must be approved by the HMGS before being used in the emergency decon corridor. Generally soap and water is the best formula for general decontamination.
8. A bleach-based solution shall be used for equipment and apparatus decontamination.

Emergency Decon Procedures:

1. Isolate victims
2. All Department members manning an emergency decon station shall be in full structural PPE and SCBA.
3. Initial focus on ambulatory victims who can walk.
4. Communicate directions with PA and hand motions.
5. Move victims away from the hazard area by directing them to an established location.
6. Set apparatus up on a slight grade so effluent will flow away from cold zone.
7. Initiate a preliminary flush using hand lines.
8. A secondary flush could be implemented using a low-pressure deluge directed behind the hand line. There is flexibility in the number of flush stations used driven by the number of victims involved, extent of contamination of the victims, and the availability of companies at the incident.
9. Provide a modesty area if it is determined that victims must disrobe and redress in
10. Provide gender-segregated lanes if possible.
11. Transfer patient care to EMS.

12. Non-ambulatory victims shall be passed off from the hot zone entry personnel to decon personnel at the front of the decon line. Decon personnel will assist non-ambulatory victims through the decon process and pass the victims off to appropriate personnel at the cold zone line.

Mass Casualty Emergency Decontamination:



Mass casualty emergency decontamination is emergency decon, involving 10 or more victims. The decon process is extended and stretched over a larger area and involves more manpower and apparatuses and resources.

Engines and Ladder are used to create modesty corridors with salvage covers draped over the rails of the extended aerials; many more victims can be processed through this arrangement. Engines can also be used to create a corridor of water spray using hose lines or nozzles attached to discharges.

Mass Decon Corridor Considerations:

1. Use loud audible device to provide information and direction to the victims
2. Set up as rapidly as possible
3. Use a large area
4. Set up on a slight grade so effluent will flow away from cold zone
5. Provide a modesty area
6. Provide for gender segregated lanes if possible

Section 23: Technical Decontamination

Technical Decon is implemented when a planned technical HazMat entry is made. In this case the, effluent must be contained and disposed of according to federal guidelines. Technical Decon is a function of the HazMat Group.

Technical Decontamination Equipment (Refer to All Battalions)

Technical Decon Set-up (Refer to All Battalions)

Technical Decon Location:

1. Secure a large flat protected area adjacent to hot zone, protected from the media and public.
2. Selected area shall be positioned uphill and upwind.
3. Technical Decon line shall be setup according to training, unless the Decon Officer orders that a different tech decon configuration be used.

Technical Decon Process:

1. Personnel shall enter the decontamination corridor from the hot zone side.
2. Tools shall be dropped on the hot zone side in the designated area.



3. A decontamination team member shall confirm that personnel to be decontaminated are O.K. and have an adequate air supply. If a problem exists, emergency decontamination is to be initiated.
4. Remove contaminants
 - a. Step into pool
 - b. Protective clothing shall be examined for cuts and breaches
 - c. Initiate rinse/scrub/rinse of the PPE, beginning at the head and systematically moving down towards the feet
 - d. Assure boots, gloves, kneecaps and armpits are cleaned
 - e. Decontamination team members shall assist the entry team members with stabilization as needed with the use of scrub brush handles and shower wands
 - f. Continue through to next pool and repeat rinse/wash/ rinse until personnel are clean
 - g. Avoid over spray and splashing
 - h. Move out of the spray wash area.
 - i. Screening for residual contamination shall be conducted at this point to assess the effectiveness of the decon process. Using available monitoring equipment applicable to the involved HazMat product shall render the individual clear to proceed through the decon process or return for additional rinsing
5. Remove respiratory protection
 - a. Open suit carefully if a vapor tight suit (Level A) is used.
 - b. When the suit is unzipped, peel it back so that the dirty side is facing inward, then fold down.
 - c. Changeover SCBA or remove. Changeover or removal will require a decontamination team member's assistance.
6. Remove protective clothing
 - a. Have individual sit down in a chair. A decontamination team member may provide removal assistance.
 - b. Remove duct tape or bands if used.
 - c. Remove outer glove. Turn inside out.
 - d. Fold suit down to boot level.
 - e. Remove boots.
 - f. Complete suit removal.
 - g. Remove facemask.
7. Remove outer personal clothing if contamination is suspected.
8. Proceed to decontamination shower if required.
9. Dry off and redress into clean clothing.
10. Report to rehab for rest, re-hydration, and medical monitoring.

**Section 24: Dry Decontamination**

Dry decontamination excludes the use of water and relies on the physical removal of radioactive contamination by removing clothing, brushing or removing the contamination with tape. This process is most commonly associated with decontaminating personnel involved in radiological/nuclear incidents and is both time and manpower intensive.

Section 25: Personal Protective Equipment (PPE)

HazMat Company Members are issued additional equipment specific to HazMat responsibilities

1. Each member of a HM Company shall be issued one safety helmet
2. Each member of a HM Company shall be assigned one Level A suit prior to making entry as determined by the Operations Chief present at a HazMat incident.
3. It shall be the responsibility of the HM Company to test and maintain the suit according to guidelines from:
 - a. Manufacturers recommendations
 - b. NFPA 1991, 1992
 - c. OSHA 29 CFR 1910.120, Section K
 - d. OSHA 29 CFR 1910.120 Appendix A, Section A
4. Company Commanders shall arrange and make available the equipment and supplies for testing and maintenance purposes.
5. Company Commanders shall maintain a log in which all members of the HM Company shall record the pertinent information of each Level A suit, such as, pressure test date, visual inspection date, expiration date, exposure and or decontamination information, and other related material. This is in addition to the suit log, which is an attachment for each individual suit.
6. HM Companies shall be responsible for the safe keeping and guarding of their assigned equipment. Members shall protect against unnecessary exposure to sharp objects and heat to prevent the possibility of damage. Members shall notify their Company Commander of any defects or damages which shall render the suit unusable.
7. Should a HM Member's Level A suit become unusable, Company Commanders shall arrange for a replacement with the Special Operations' BC. A minimum of five extra Level A suits shall be carried on each HM apparatus. The extra suits shall be maintained and tested by the respective Company.
8. When members are no longer assigned to a HazMat station or a part of the HazMat team, they shall return their assigned equipment to the Company Commander.
9. HM Company members on mandatory recall shall report to the assigned area with all of their assigned equipment.



Selecting Chemical Protective Clothing (CPC):

CPC are items made from chemical-resistive materials, such as clothing, hood, boots, and gloves that are designed and configured to protect the wearer's torso, head, arms, legs, hands, and feet from hazardous materials.

The HFD recognizes four levels of CPC:

1. Level A
2. Level B
3. Level C
4. Level D

Level A:

1. The hazardous substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates: or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases or particulate of materials that are harmful to skin or capable of being absorbed through the skin.
2. Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible.
3. Operations are being conducted in confined, poorly ventilated areas, and the absence of conditions requiring Level A have not yet been determined
4. When dealing with pesticides (liquids or vapors).
5. Dealing with unknown chemicals.
6. Chemical splashes and vapors - should never be immersed in chemicals.

Level B:

1. The atmosphere contains less than 19.5% O₂.
2. Gases and vapors are not harmful to or are not absorbed through the skin and splash protection is needed.
3. When the type and atmospheric concentration of a substance is known and require a high level of respiratory protection.

Level C:

1. When the concentration and type of airborne substance is known and the criteria for using air-purifying respirators are met.



- a. Atmospheric contaminants, liquid splashes or other direct contacts shall not adversely affect or be absorbed through any exposed skin.
- b. Types of air contaminants have been identified, concentrations measured and an air purifying respirator is available that can remove the contaminants.

Level D:

1. Atmosphere contains no known hazards.
2. While at an incident, the responder should not be exposed to splashes, immersion or come in contact with any hazardous chemicals.
 - a. Investigative mode (full turnouts - Openings closed with duct tape if contact with product may occur)
 - b. Emergency rescue (full turnouts - Openings closed with duct tape if contact with product may occur)

Maintenance, Storage, & Decontamination of CPC:

1. Level A Suits
 - a. Maintenance and Testing (See General Section above)
 - b. Storage
 - 1) Store loosely folded in storage bags in a dark, cool location.
 - 2) Fill out suit log after every use.
 - (a) Note duration of exposure
 - (b) Chemical exposed to
 - (c) Initial and date.
2. Level B, C and D Suits
 - a. Maintenance - visually examine for tears, abrasions, punctures and deterioration to suit material after every use.
 - b. Storage
 - 1) Fold and put into storage bins or equipment bags.
 - 2) Store in cool dark location
 - c. Decontamination – Only for multiple use suits
 - 1) Decontaminate with cold water or soap & water. Sponge or soft brush may be used.
 - 2) Clean interior of suits with mild soap and water to remove perspiration and soiling.



- 3) Hang to dry in a shaded, dry location.

Disposal of contaminated CPC:

1. Level A, B, C, or D suits should be double bagged and given to a chemical waste disposal company for proper disposal under the following conditions:
 - a. If a one time or cumulative exposure to a substance goes beyond the manufacturer's hourly exposure recommendation (permeation), the suit should be discarded.
 - b. If punctured, abraded, or the zippers or vents are damaged (penetration), the suit should be discarded.
 - c. If the manufacturer's recommended time frame is exceeded (age), the suit should be discarded.
 - d. Level A suits should be replaced or down graded per manufacturer's instruction.
 - e. Responder CMS suit - down graded or discarded when no longer able to pass visual and or pressure test.
 - f. If the material becomes discolored, swells, shrinks, blisters, becomes brittle, sticky, soft, or deteriorates (degrades), the suit should be discarded.
 - g. Suit has been exposed to chemicals with toxic or carcinogenic liquid or vapor hazards.
 - h. Level B and C suits that are designed for one time usage.

CPC Chemical Boots – Use & Maintenance:

1. Use
 - a. Chemical boots provide protection for both chemical resistance and abrasion from the physical elements.
 - b. When using chemical boots, pick a boot two sizes larger than normally worn. This shall allow room for the chemical suit that fits comfortably.
 - c. Chemical boots are manufactured of material resistive to many chemicals.
 - d. Constructed with a safety steel toe, steel mid-sole for protection of the bottom of the foot, slip resistant soles, and it is wide at top for easy donning and doffing.
2. Maintenance and Cleaning
 - a. Boots with any of the following situations shall be disposed of:
 - 1) Punctures
 - 2) Material that has become discolored, swells, shrinks, blisters, becomes brittle, sticky, and soft or deteriorates (degradation).
 - 3) Boots that have been exposed to unknown or to known chemicals with toxic or carcinogenic liquid or vapor hazards.



- b. Storage & Maintenance
 - 1) In cool, dry shaded area
 - 2) Cleaning
 - 3) Soap and water with brush, as needed
 - 4) Air dry in shaded location

3. Disposable Boot Covers

- a. Worn over the chemical boot to reduce contamination by chemicals, waste, and soil and helps to reduce clean up and decontamination.
- b. Discard appropriately when operation is over.
- c. One size fits all

CPC Chemical Gloves – Use & Maintenance:

General: No glove offers protection of the hands from all chemicals and physical factors that may be found at a hazardous materials emergency. Each protective material performs well in certain working conditions and not as well in others.

For maximum hand protection, over gloving and double gloving should always be used:

1. Double Gloving
 - a. Latex surgical gloves under a work glove
 - b. Prevents exposure when doffing the work glove and provides an additional barrier for hand protection
2. Over Gloving
 - a. The wearing of a second glove over the work glove
 - b. Additional chemical and abrasion protection during lifting and moving operations
3. Glove Types & Selection
 - a. Selection of gloves must be based on the specific chemical that the glove will be exposed to.
 - b. Viton is the most chemically resistive of all rubber gloves. Good protection against chlorinated and aromatic solvents.
 - c. Butyl Rubber. Chemical resistance to dioxane, ketones, acetones, aldehydes, alcohols, esters, most organic acids and caustics



- d. Silver Shield is a highly resistive glove that can be used with various solvents, acids and bases, commonly used as an outer glove
- e. Nitrile is a synthetic rubber material that resists chemicals and is resistive to abrasions, punctures, and cuts. Good resistance against acids, caustics, and petroleum products.
- f. Latex offers a biological barrier with limited chemical protection. It is one time use and is most commonly used as an inner glove.
- g. Cotton Inspection Glove - goes over latex inner glove to facilitate hand entry into and out of outer glove, it offers no chemical protection.

Section 26: Monitoring Equipment – Chemical, Biological & Radiological

The Hawaii Fire Department maintains and operates a variety of instrumentation for monitoring and detecting chemical and biological substances. The following section provides a general use and maintenance guideline to keep the tools ready for response. Manufacturer's instructions for each type of detector should be consulted for specific operations.

Chemical Monitors:

1. Combustible Gas Indicators (CGI): are used to test atmospheres that may contain a sufficient level of combustible vapors to cause explosion or support combustion. CGIs sample the atmosphere and test for the product each sensor has been manufactured and calibrated for. The most common CGI is the % LEL meter which measures vapors on a scale from 0-100% of the Lower Explosive Limit (LEL). The CGI operating instructions should be consulted prior to use.
 - a. Maintenance:
 - 1) CGIs shall be calibrated following manufacturers instructions on the 1st Monday of each month and after each incident it is used. On every Monday thereafter the monitors will be *Bump Tested. The results shall be recorded in the CGI Calibration Log maintained for each monitor. Monitors will be checked weekly, at which time any problems with sensors or charging problems will be noted. Expiration dates should be noted as not to let sensors expire.
 - 2) Battery status on each of the devices will be checked by the FEO on each apparatus on the first working shift of each work cycle. The batteries shall be replaced when the status reaches half of a full charge.
 - 3) Bump Test: A bump test consists of introducing calibration gas to the monitors while on and making sure the units are reading the calibrated amounts.



2. Hazmat ID – uses infrared spectrometry to produce a footprint of an unidentified powder or liquid and with the use of a computer program, match it with a library of images stored in its laptop computer.
 - a. Custom libraries of products particular to certain industries can be developed and stored on the laptop.
 - b. The Hazmat ID will produce footprints of covalently bonded molecules only. It will not produce a footprint of an ionic bonded molecule, elemental substances, dilute water-based solutions, or individual components of any mixture.
 - c. The technician performing the set-up and the identification shall be thoroughly familiar with the process involved and instructions that came with the unit
3. M-8 Chemical Agent Detector Paper - provides a qualitative detection (color change) in the presence of liquid nerve (G-type) or blister agents. Vapors will not be detected using this detector paper. M 8 paper is best used during initial reconnaissance of the incident site, to screen suspicious liquids. If no color change is indicated, nerve and blister agents can probably be eliminated. False positives may occur in the presence of certain insecticides and petroleum products. M 8 paper will not detect agent in water. The paper comes in booklets that contain twenty-five perforated test sheets. The front of book contains an indicator chart to determine agent present. A color change by the M 8 paper can be compared to the indicator chart for a product match.
4. The Drager Chip Measurement System (CMS) - combines chemical-specific chips and an electronic analyzer for highly accurate and reliable gas and vapor measurements. The CMS provides a quick result on an easy to read Liquid Crystal Display (LCD). The CMS is ideal for situations where glass tubes cannot be used, or where it is not cost-effective to keep a monitor on-hand that requires sensors and calibration. A Complete Emergency Response Kit includes an analyzer, remote system, telescopic probe, flashlight, and notepad.
5. Colorimetric Tubes - are used for measuring the concentration of known vapor or gas contaminants in the air. The concentration of the contaminant is determined by observing the color change in the tube. The measurement on the tubes is read in parts per million (ppm), percentage (%), or millimeter (mm) scale depending on the tube selected. Environmental conditions such as barometric pressure, humidity, and temperature can have a direct effect on the chemical reaction in the tube. Refer to the manufacture's instructions regarding these situations. A testing unit consists of an aspirating pump (usually with a stroke counter) and detector tubes.

Radiological Monitors:



Radiation detection and measuring instruments are used routinely to monitor personnel working around or with radiation sources and to check for any leakage of radiation from containers used in the storage or transportation of radioactive materials.

1. Survey Meters - measure exposure rates by the intensity of the radiation at some point in time. Radiation survey meters are used for:
 - a. Locating sources of radiation
 - b. Surveying facilities for leaks
 - c. Predicting the possible exposure present in an area
 - d. Monitoring contamination levels on equipment and personnel.
 - e. Evaluating the need to post warning signs and or isolate an area
2. Canberra Mini Rad Model #MRAD113– measures the cumulative exposure or total amount of radiation exposure during the period of measurement.
3. Models Used
 - a. Thermo-Rad ESM FH 40G-L– is a ruggedized, portable, survey instrument used to detect radioactive material.
 - b. NBR Detector FHZ 672E



Model 14C

Section 27: Tools and Equipment

The Department maintains and operates a variety of tools and equipment to facilitate the efficient and effective mitigation of HM events. The following section provides use and maintenance guidelines to keep these tools in operational response status.



1. Thermal Imager – specific guidelines for TIC operations can be found under separate cover in the Small Equipment SOG. Thermal imaging mode or the video mode can be wirelessly transmitted to a remote location in the cold zone. Sony HC-96 Digital Camera w/ protective case
2. C-5 SAM Weather Command – is a portable weather station.
 - a. C-5 SAM computes running averages of vector wind speed, vector wind direction, air temperature and stability of the wind.
 - b. This data, along with the instantaneous measurements of wind speed, direction and air temperature (and optionally Relative Humidity), are updated on the display screen every 30 seconds.
 - c. C-5 SAM can be used as a stand-alone station independent of any computer or supporting electronics.
 - d. It can be used for routine monitoring or in conjunction with the computer based ALOHA plume dispersion model.
 - e. With or without the dispersion model, the data will allow you to estimate downwind travel time and distance, locate potential impact areas, and target your evacuation zone
3. HazShower – is a deployable shower used by both responders and victims to remove contaminants. The shower is carried to the decontamination site and erected by unfolding its parts. Water spray nozzles on the side and top are used for a complete drenching of the individual.
 - a. Operation
 - 1) Pump into the shower utilizing a 1 ½” line at 20 psi or less.
 - 2) HM manifold to shower shall be opened sufficiently to obtain a fan shaped water pattern.
 - 3) A nozzle pressure that is too high will result in a broken or inefficient spray.
 - b. Maintenance
 - 1) Decontaminate after every use with soap and water or a bleach solution.
 - 2) Drain water from piping
 - 3) Fold and lock unit properly
 - 4) Inspect for worn or damaged parts, seals and overall condition
 - 5) Make sure the seals are in place for next use
4. AHURA – Hazardous Materials Identifier that matches unknown chemicals with a library of known chemicals/ substances.



5. King Pelican Light - is an intrinsically safe hand light used in areas that may have an explosive atmosphere, such as LEL. The housing of the unit is waterproof.
6. Non-Sparking Safety Tools - are manufactured of an alloy of Beryllium and Copper. The combination of the two metals offers strength and wears resistance to the tools. Non-sparking tools will not emit a spark capable of igniting volatile chemicals. Safety tools are non-magnetic and corrosion resistant.
 - a. Non-sparking Tool Use – shall be used anywhere flammable or explosive chemicals are used.
 - 1) Oil and petrochemical plants
 - 2) Paint spraying
 - 3) Explosives manufacturing, stored or used
 - 4) Areas of high concentrations of dust
 - b. Nonmagnetic Usage – shall be used anywhere electrical energy may be encountered
 - 1) Around aircraft
 - 2) Radio and television
 - 3) Magnetic oil equipment
 - 4) Military equipment
 - 5) Vicinity of high current conductors
 - 6) Certain public utilities
 - c. Corrosion Resistant - An alternative to conventional steel tools
 - 1) Resistant to acids and alkalis
 - 2) Resistant to salt water
 - d. Cautions
 - 1) Beryllium tools: Uncontrolled sharpening or grinding of tools may create a beryllium hazard. Beryllium dust has been shown to cause lung cancer. Tools that need grinding or sharpening shall be returned to manufacturer to do the servicing.
 - 2) Certain chemicals such as acetylene, amatol and similar liquid gases may react with copper alloys to form metalloids, which would negate the non-sparking properties of the alloys.
7. Ram Fan – is electrically powered and designed for use in confined space ventilation. They are the primary tools for providing fresh clean air to confined spaces where explosive or toxic gases and vapors can accumulate.



8. Axial Blower – is a portable, electrically driven blower used for moving air and gases within an area. The blower can be utilized for positive pressure ventilation (PPV), a ventilation technique that quickly replaces hazardous interior environments with clean, fresh air.
 - a. Used to minimize generation of interior fumes an electrical blower is preferred for HM events.
 - b. The blower unit should be intrinsically safe for use in explosive atmospheres.
 - c. A misting ring is available for attachment to the blower. A fine mist is generated when a hose line is connected to cool members at a rehab area.

9. HazMat Decontaminatable (HMD) Sked – is a flexible rescue litter designed to perform rescues in a contaminated area, yet is light, durable, easy to use and decontaminate. This differs from the Sked Rescue uses in that it's a thicker plastic made to withstand the wear and tear of dragging.
 - a. Operation and Use
 - 1) Easy to load and unload patients without lifting.
 - 2) Drags easily over surface.
 - 3) Ropes can be attached to drag sked or multiple skeds into and out off “Hot Zone” with a patient for quick evacuation.
 - 4) Non-absorbing polyethylene plastic



HMD Sked



10. Decon Shelters – are adaptable to support any type of operations from a privacy decon shelter to a command post. The shelters are stored in the WMD trailers, and have the following specifications:

- a. Model #216 (16' long x 13'6" wide)
- b. 216 sq. ft. interior space
- c. Exterior (Blue) Canopy/Removable Floor/White Top for light 2 Utility Duct
- d. Inflates with (1) 4500 psi SCBA Bottle
- e. Carrying Case Maintenance Kit

11. Trailers – the department uses trailers to provide additional required emergency equipment to the incident scene.

- a. HazMat Trailers that includes WMD capabilities
 - 1) Housed at Stations 4 and 21
 - 2) Supplies to support approximately 500 victims through the decontamination process
 - 3) Inventory is maintained by HazMat Companies
 - 4) Towed to the scene by detail apparatus Utility Vehicles