CAMBRIDGE FIRE DEPARTMENT
STANDARD OPERATING GUIDELINES

Subject: Hazardous Materials Incident Management

Date: 09/30/93
Supersedes:

I. POLICY

To provide guidance for an efficient intervention in hazardous materials incidents. Emphasis is placed on, both, the safety of the public and firefighters. It is the position of the department that all hazardous materials incidents shall be approached and managed in the safest possible manner.

II. RESPONSIBILITY

(A) All officers are responsible for the training of fire fighting personnel and for ensuring proper compliance with this guideline.

(B) All members have the responsibility to adequately learn these procedures and carry out this guideline.

(C) All members shall show reasonable judgement in the use of this guideline.

III. COMMON TERMINOLOGY

Hazardous Material: (Haz-mat)

Legal definition:

"A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated."

A more specific definition:

"A material or materials accidentally released from the original container and used in a manner not originally intended. Hazardous materials include materials that are unintentionally contaminated or mixed with other chemicals or involve some outside reactive source such as heat, light , liquids, shock, or pressure."

Hazardous Materials (haz-mat) Responder:

All persons directly or indirectly involved in the response, including dispatchers, planners, police officers, EMS providers, and firefighters.

The primary focus of this SOG shall be members of the Cambridge Fire Department (CFD).

All members of CFD are trained through the first responder awareness level to the first responder operations level.

Awareness level responders shall:

recognize the problem
identify the material (if possible)
notify more qualified responders

Operations level responders shall:

<u>utilize defensive skills only</u>
contain spill (diking)
minimize harm (evacuation, water fog, protecting in place)

IV. TAKING THE CALL

Get all pertinent information available at the time of the call.

USE CHECK SHEET IN APPENDIX "A"

1. Get Location
   - A. Life or Exposure Hazard
     1. X-Ray
     2. Downtown
     3. Isolated Area
     4. Railroad Tracks
     5. Other

2. Determine if Rescue is Necessary
   1. Driver Trapped
   2. Multiple Victims from Fumes
   3. Plant Fire with Victims
   4. other

3. Type of Situation (If Hazardous Material Involved)
   Start Proper Response as Directed By Individual SOG's

   A. Get Identification from Witness (correct spelling and two of the following)
      1. DOT #
      2. Placard
      3. Stenciled Name
      4. Name of Driver or Plant Worker
      5. GATX#, STCC#. etc
      6. Name of Carrier

   B. Is Material Leaking?
      1. Leak
      2. Spill
      3. Gas Release
      4. Fire
      5. Explosion
      6. other

   C. Form of Leaking Material
      1. Gas
      2. Liquid
      3. Solid
      4. Radioactive
      5. other

   D. Quantity of Spill
      1. 30,000 gallon
      2. 55 gallon Drum
      3. One gallon Container
      4. 20 pound Bag
      5. other

   E. Leak Characteristics
      1. Color of Flame
      2. Odor
      3. Color of Substance
      4. Color of Vapor Clouds
      5. Itching, Burning
      6. any other characteristics

   F. All above information must be recorded for later disemmination to responding units.

   G. Maintain Written/Recorded Log of All Activity

V. RESPONDING TO THE ALARM

A. Officer shall attempt to have adequate manpower according to department policy.

B. Respond with Engine 3, Rescue 2, and possible Tanker 1 -- at the discretion of the Officer in Charge.

C. Tanker should be responded to any situation where water supply may be a problem -- at the discretion of The Officer in Charge.

VI. ARRIVAL ON SCENE

A. Managing the Hazardous Materials Incident

This SOG will utilize a six step process for managing a haz-mat incident. This process will be tied to the acronym haz-mat

H - Hazard Identification
Recognize and identify the presence of hazardous materials

A - Action Plan
Evaluate the situation by determining what you are going to do, immediate and long term needs, and who is in charge.

Z - Zoning
Control the risk by establishing a restricted zone (exclusion), limited access zone (contamination reduction), and support zone.

M - Managing the Incident
Establish the necessary incident command structure to handle the emergency.

A - Assistance
Determine additional resources needed including more fire companies, haz-mat team, technical assistance, or private contractors.

T - Termination
Assess what is needed to conclude the incident such as clean-up, decontamination, physical exams, rehabilitation, and post-incident analysis.

HAZARD IDENTIFICATION

Before a haz-mat incident can be managed, it must first be recognized that dangerous chemicals are present. Although that sounds simple, it is not.

A haz-mat incident is not always a spectacular event such a flaming tank truck or a large chlorine cloud visible from five miles away. It is often the little things that are overlooked such as the small transformer in the basement with PCB's, broken pesticide cases carried on the grocery truck, or picric acid that has crystalized at the local high school.

Every incident is a haz-mat incident until you are 100% sure that no dangerous chemicals are present.

Initial Size-Up

The most critical aspect of response to a haz- mat incident is the initial size-up of the situation. This is normally the responsibility of the first arriving fire officer and includes:

detectionion and identification of hazardous materials

assessment of life, explosion, and health hazards

immediate follow-up actions

In size-up, as in all other actions, personnel safety is the officer's primary responsibility. The risk of exposing personnel to danger must be weighed against the benefits. Do not risk the lives of firefighters in vain attempts to recover dead bodies or to mitigate chemical emergencies that are out of control.

Detecting Hazardous Materials

The presence of hazardous materials may be detected and identified in a number of ways. The most common are:

pre-planning
noting container shape
reading standard placards attached to a vehicle or container
reading vehicle or container markings or labels
reading shipping papers
observing the physical properties of the materials

Early recognition of hazardous materials will reduce the risk to emergency personnel and allow for the initiation of proper actions t mitigate the incident.

ACTION PLAN

Effective incident management begins with a good on-scene report from the first arriving officer. An effective and complete description of what is occurring at the incident will enable other incoming units to have a better understanding of the situation.

First Arriving Officer Communication:

What do I have? - The officer describes what he/she sees, over the radio, to the communications center and other responding units. The description may include information such as building size, construction, amount of involvement, type of occupancy, unusual conditions, and hazards. Color of Smoke if any. This brief report will help others picture what is occurring.

What will it do? - The first arriving officer gives an assessment of what he feels is the potential destructive force of the chemical involved.

What am I doing and going to do? - This will inform others of actions being taken. Such actions may include: advancing an attack line, supplying water, or identifying the hazards present.

What do I need? - Needs may include assignments given to other companies or requests for additional resources. When stating needs remember that, "Nothing right now," is a perfectly legitimate response. It may take time to determine what the real problems are. While you are assessing problems other responding units can be directed to areas close to the incident, but away from the front door. Use a resource pool or staging location near the incident where apparatus should wait until response assignments are given. Too often the emergency scene looks like a used fire apparatus lot. Keeping apparatus away until it is needed will allow easier access.

Who is in command? - Everyone responding to or working at an incident needs to know that command is established. All departments should have SOG's (standard operating guidelines) that direct how command is established and transferred.

Control of the incident has begun once the first arriving responder has answered the five critical questions answered above. The first officer should immediately establish a game plan to provide for a safe, systematic approach to handling the haz-mat emergency. The original plan may not be followed throughout the incident, since haz-mat scenes are dynamic and can escalate rapidly. Therefore, your action plan should include Plan A and other alternate plans of attack if the emergency should change. If we insist on sticking to Plan A, personnel may be killed or injured or the incident may escalate uncontrollably.

A system to classify incidents based on severity and needed resources is effective in managing the haz-mat incident. Incident level classifications will help the first arriving officer or incident commander use appropriate control procedures.

HAZARDOUS MATERIALS INCIDENT CLASSIFICATION

A major incident for one agency may be easily handled by another agency. Key factors should be considered in determining the level of a haz-mat incident. Key factors may include:

preplanning
ability of the responding agency
level of assistance needed
ability to acquire additional resources

Incident Level Criteria

A three level incident classification system is outlined below. The three levels are determined by the following criteria:

Extent of municipal, county, and state government involvement

extent of injuries and/or deaths

extent of civilian evacuation needed

availability and need of haz-mat response team

level of technical expertise required to abate the incident

Level I Incident

Level I incidents can be effectively managed and mitigated by first response personnel without a haz-mat response team or other special unit.

Spills that can be properly and effectively contained and/or abated by equipment and supplies immediately accessible to fire engine or ladder companies.

Leaks and ruptures that can be controlled using equipment and supplies immediately accessible to engine or ladder companies.

Fires involving toxic materials that can be extinguished and cleaned up with resources immediately available to engine or ladder companies, or first responding personnel.

Haz-mat incidents not requiring civilian evacuation.

Haz-mat incidents that can be contained and controlled using engine or ladder company resources.

Level II Incident

Level II incidents require the special technical assistance of a haz-mat response team, industrial specialist, or government strike team.

Spills that can be properly and effectively contained and/or abated by specialized equipment and supplies immediately available to a haz-mat response team or other special unit.

Leaks and ruptures that can be controlled using specialized equipment and supplies immediately available to a haz-mat response team or other special unit.

Fires involving toxic and/or flammable materials that are permitted to burn for a controlled time period or are allowed to consume themselves.

Haz-mat incidents that require civilian evacuation within the area of the agency that has primary jurisdiction.

Haz-mat incidents where specialized technical information is required.

Haz-mat incidents that can be contained and controlled using the available resources of a haz-mat response team or other specially trained unit.

Level III Incident

Level III incidents are major disasters.

Spills that cannot be properly and effectively contained and/or abated by highly specialized equipment and supplies immediately accessible to a haz-mat response team or other specially trained unit.

Leaks and ruptures that cannot be controlled using highly specialized equipment and supplies immediately available to a haz-mat response team.

Fires involving toxic materials that are allowed to burn because water is ineffective or dangerous; or because there is a threat of large container failure; or because a large explosion, detonation or BLEVE has occurred.

Haz-mat incidents that require evacuation of civilians across jurisdictional boundaries.

ZONING

After identifying the hazard and developing an initial action plan, the next step is to isolate the risk by setting up zones (see Figure 2-1). Quickly initiating site control by establishing zones reduces danger to the public and emergency response personnel. Setting up an elaborate site control system is a difficult task for the first responder. However, establishing the necessary restricted and limited access zones can be done quickly and simply.

Many mistakenly assume that site control is only necessary for major emergencies. This fallacy can cause an incident to escalate unnecessarily or create management problems for even the smallest incidents.

Control zones should be used on every incident that involves hazardous materials for two reasons.

1. It is effective in gaining control of a potentially volatile situation.

2. If used on every incident, whether it is a level I, II, or III emergency, you will be ready to quickly establish effective site control.

Safety Zones

Site control is critical to effective management of a haz-mat incident. Safety zones can be expanded or reduced depending on the situation. Each one should be clearly marked. All personnel should understand agency procedures and be thoroughly trained in the use of safety zones. Remember, a site control system needs to be established early, and should be used to some degree in every haz-mat incident.

ALL ZONES (AREAS) SHOULD BE ESTABLISHED UPWIND!
With wind direction flags located in strategic places for wind direction changes

Restricted Zone

The restricted zone is sometimes referred to as the hot, red, or exclusionary zone. This area represents danger to life or health and should be approached with extreme caution. Depending on the material involved, appropriate protective clothing and equipment is necessary to enter this zone. Establishing the size of the restricted zone depends on the amount and

ENVIRONMENTAL PROTECTION AGENCY (EPA) TERMS	Other Common Terms
Exclusion Zone	= Hot, Red, of Restricted Zone
Contamination Reduction Zone (CRZ)	= Warm, Yellow, or Limited Access Zone
Support Zone	= Cold or Green Zone
Hotline	= Contamination Perimeter
Contamination Control Line	= Safety Perimeter

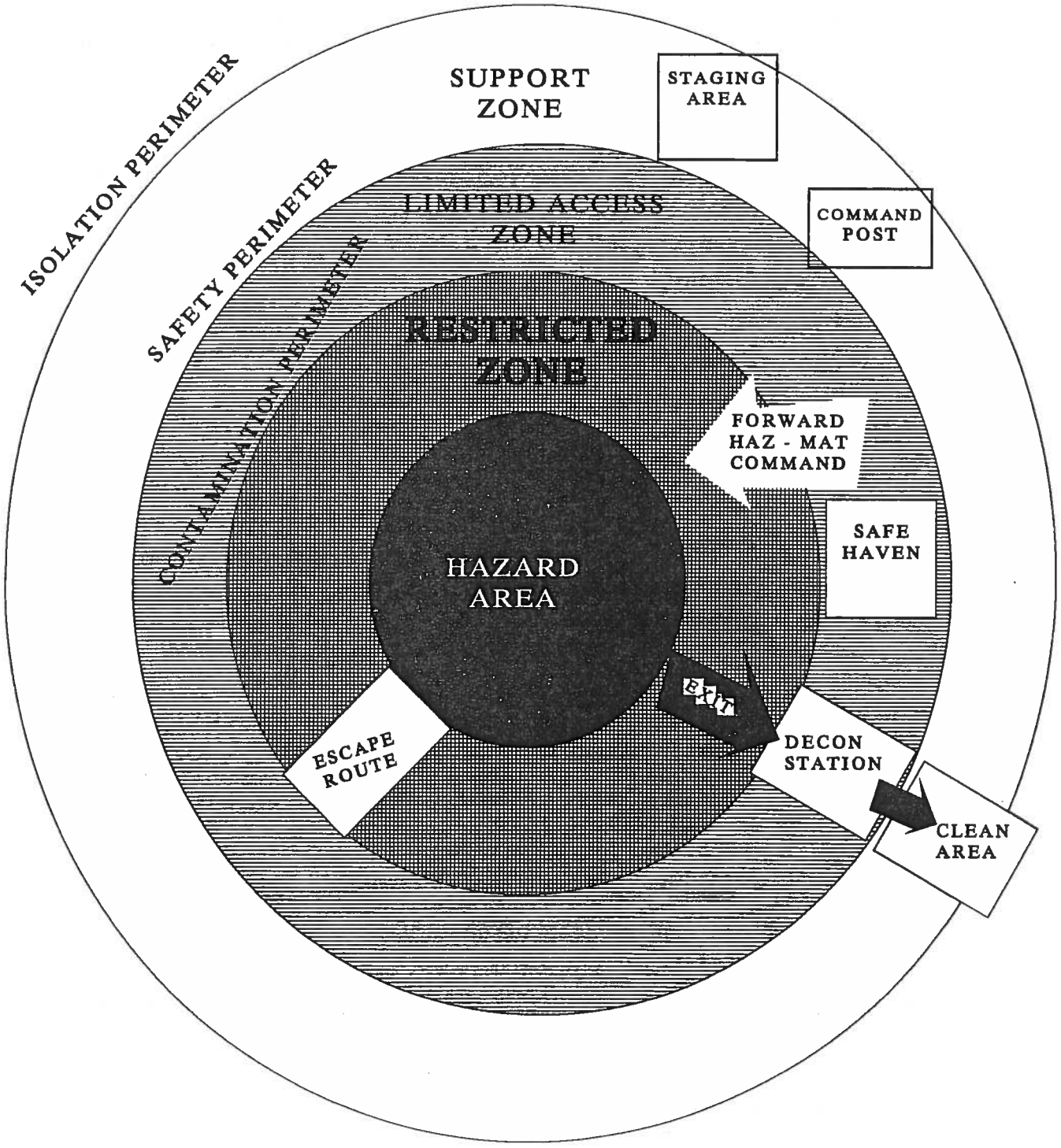


Figure 2-1

properties of the chemical involved and location of the incident. To determine safe distances for specific materials refer to the DOT Emergency Handbook or to one of the computer database systems available to emergency response personnel.

Limited Access Zone

The limited access zone, also referred to as the warm, yellow, or contaminated zone, is the area for site control directly outside the restricted area. It provides the forward access point to the restricted zone for the necessary support personnel and equipment, escape routes, and decontaminations stations. Too often this site becomes the walk-through area for administrative personnel, media, and personnel stationed in the support zone. The limited access zone should be restricted t essential personnel and equipment only. All others should be kept out of the limited access zone unless they are needed for restricted zone support. It is easier to evacuate or reposition the limited access zone when it is not congested.

Support Zone

The support zone, sometimes referred to as the cold or green zone, is the area for site control directly outside the limited access zone. This is the safe area for the incident commander, outside agencies involved in the incident, media, Red Cross, and medical personnel, and staging.

MANAGING THE INCIDENT

Implement the Incident Command System (ICS)
- Use ICS SOG for guidance
- Written diagram of command structure
- Appoint Safety Officer

Each class of chemical has a separate SOG
- Refer to specific SOG

ASSISTANCE

An incident commander needs adequate resources to deal with the complexities of hazardous materials. Available resources should be identified before an incident occurs. The following key resources will make incident management more successful.

Telecommunication Personnel (Dispatcher)

The dispatcher is the first link in the overall success of the operation. A well- trained dispatcher can assist emergency responders in product identification, incident assessment, and resource coordination. Critical information provided by the dispatcher will smooth the way to a safe, effective response. The dispatcher can provide information such as, "The cargo van fire you are responding to is placarded explosive A." The dispatcher can assist in acquiring resources during a haz-mat emergency. Dispatchers should keep an updated resource list close at hand. Telecommunications personnel should have an understanding of product identification, placarding, and available resource materials prior to an incident.

Police Officer

In most cases, a police officer is the first emergency responder on the scene. The officer should be capable of properly recognizing hazards and assessing the severity of the incident. It has been proven that the first arriving police unit can be at significant risk is the officer cannot properly recognize a hazardous material. A well-trained police officer will:

- recognize the presence of a hazardous material
- establish a restricted zone to isolate the product
- initiate evacuation
- not become exposed to the incident

Because police department usually control evacuations during haz-mat emergencies, other response agencies often are not prepared to manage evacuations. It you ask haz-mat response teams or fire departments how they would evacuate, they will most likely say that the police department would handle evacuation.

Hazardous Materials Response Team (HMRT)

Industry and the fire service have realized that a system must be in place to control haz-mat incidents. Specialized groups called emergency response teams and hazardous materials task forces were organized in the late 1970s to meet this need. The chemical industry began providing these services earlier since it manufactured, transported, and used hazardous materials. The chemical industry is still the most knowledgeable emergency service provider.

A Hazardous Materials Response Team (HMRT) is a special resource unit that deals with unusual materials incidents. Haz-mat incidents can be handled more competently when the special resource capability of emergency response providers keeps pace with haz-mat emergencies. Today, many emergency service managers are faced with establishing HMRTs and increasing their special resource capability for haz-mat incidents.

HMRTs across the United States and Canada vary in expertise level and equipment that is available. There are plans to standardize equipment, knowledge level, and professional qualifications for HMRTs. This process began with the introduction of NFPA 472, OSHA 1910.120, and other regulations. However, for the next several years the discrepancies between HMRTs may be significant.

The incident commander must know the assisting HMRT's capabilities and available tools/equipment to properly assign tasks during a haz-mat emergency. Frustration and a more unmanageable incident will result if a task is assigned for which the proper equipment is not available.

Fire Department policy should establish the operating procedures of a HMRT. If a local HMRT is not available, know the location of the closest public or private HMRT. Assess it's capabilities and response time and establish a response agreement.

Private Technical Specialist

In many situations the technical specialist is vital for safe management of a haz-mat emergency. The technical specialist provides specific expertise to the incident commander. The technical specialist can be a manufacturing representative or private citizen who volunteers help. A chemist with knowledge of emergency response procedures and a toxicology background would be most helpful. Such specialist need to be identified before an emergency occurs. Decide what type of specialists may be needed by evaluating the haz-mat dangers present in your community. Establish a working relationship with these specialists. Train them in operational procedures to effectively utilize their abilities during large and small haz-mat incidents.

Private Contractors

One of the most difficult areas of incident management occurs after the emergency has been mitigated--clean up. Who is responsible for cleaning up this mess? Due to the complexities and liabilities of hazardous waste management, clean-up is often handled by private contractors. *Private Contractors* are privately owned companies that are trained, equipped, and insured to deal with clean-up. The clean-up process can be delayed hours or even days if the incident commander does not know about these companies or how to contact capable private contractors.

A list of private contractors available in your area should be kept current and made available to incident commanders. This list should include the name of the key contact personnel and how they may be reached in an emergency. Before adding a private contractor to your list, review the company's capabilities, professional qualifications, and equipment.

Assistance Summary

We have reviewed five areas of assistance that are often overlooked in haz-mat incident management. To insure these areas are adequately covered, ask:

Are dispatchers trained in hazardous materials incidents?

What role will law enforcement play in haz-mat response?

What are the capabilities of the available HMRT?

Have the technical specialists needed been located?

Have private contractors for clean up and disposal assistance been identified?

We have not covered all areas of assistance that might be needed in all situations. Each community faces different risks with varying resources. The key factor is to anticipate your needs and establish a way to acquire resources when needed.

TERMINATION

A systematic procedure to terminate a Level II or Level III haz-mat incident could occur after the incident has been mitigated. Unlike other emergencies, termination of a haz-mat incident is not simply picking up the hose and going back to the station to clean equipment. Although there are many termination procedures, we will concentrate on the following four areas:

1. Decontamination
2. Rehabilitation
3. Medical Screening
4. Post-incident Analysis

Decontamination

There are critical decontamination procedures that should be on-going during a haz-mat incident. Procedures to decontaminate anything leaving the restricted zone and contamination perimeter must be implemented to prevent or reduce the transfer of contaminants by people and/or equipment. These procedures should include decontamination of:

personnel

protective equipment

monitoring equipment

clean-up equipment

Unless otherwise demonstrated, everything leaving the restricted zone should be considered contaminated.

On-site decontamination consists of rinsing equipment, personnel, etc., with large amounts of water and detergent/water solutions. If contaminants are known, then a specific detergent and/or solvent can be used to decontaminate. Figure 2-9 illustrates the minimum physical layout for personnel decontamination for a relatively small, well defined situation. Appendix "B" contains an illustration of the maximum physical layout for personnel decontamination during a worst case situation. Each site requires special consideration. Multiple decontamination layouts may be preferred to a large complex one..

The acronym I HOPE helps us understand some important decontamination concepts.

I - Identify

H - Help or hold

O - Operations

P - People and equipment

E - Environmental considerations

I - Identify

A hazard must be **identified** before action is taken to eliminate the risk of serious danger. Use reference materials to determine life hazards and characteristics of the material with which you are dealing. Be sure to use more than one reference to obtain a broader perspective on the product. Some references contain conflicting information for a chemical, assume the more hazardous description to be correct. Remember, "Fools run in where wise men fear to tread."

H - Help or Hold

Determine if the risks and benefits are worth a quick "in and out" **help** rescue or whether you should **hold** and use established procedures determined prior to the incident. The purpose of these guidelines is to help you consider the many factors that go into making such a decision.

O - Operations

Operations include the actual plans and procedures of decontaminating both victims and rescuers. Support personnel who were inside the yellow or warm zone must be decontaminated. The smaller the incident and the fewer people exposed, the better the outcome will be.

P - People and Equipment

Determine the appropriate number of **people** it will take to mitigate an incident. Be realistic -- realize the process will be lengthy if only two people are assigned to rescue 16 victims and one to run a decontamination station. Use people to their maximum potential but, do not over extend nor exert your manpower. For example, once the containment crew is in chemical protective clothing (CPC), send those assisting to the initial rinse pool to aid victims being rinsed. These same people should be prepared to change out bottles for the containment crew. In addition, be aware of the **equipment** required for an incident. Four 30 minute air bottles are not enough for four men in CPC's for two hours. For these reasons people staffing decon positions should be dressed to the same level of protection as the entry team.

E - Environmental Considerations

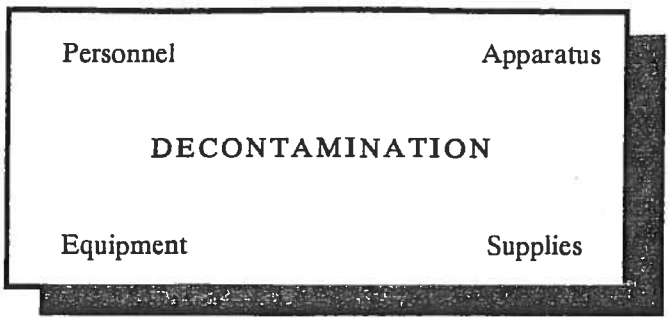
Time of day, temperature, wind speed and direction, and other **environmental considerations** are important factors in any incident. They should be determined prior to leaving the station and updated often. For example, if an incident occurs at 3:00 a.m. during a blizzard, it will be advantageous to obtain a bus label it "DIRTY," and use it for victims. Take the victims to a warm, controlled area, such as a heated garage, where decontamination equipment and medical personnel can be stationed.

Initial Decontamination Steps

Identify the material
Isolate the area
Deny entry

Secondary Decontamination Steps

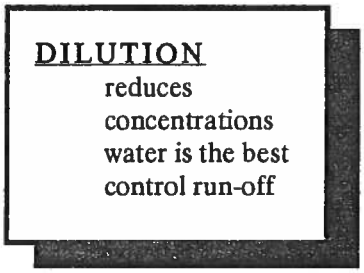
Establish decon officer
Establish decon sector
Correct protective clothing
Confer with medical officer
Assure persons leaving hot zone have been cleaned



Decontamination Methods

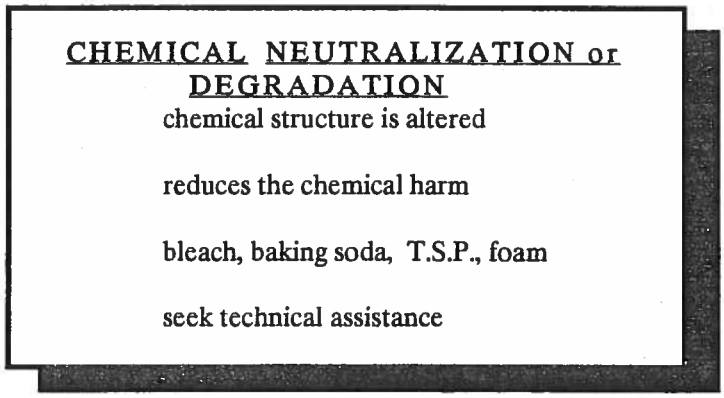
Dilution

Dilution ranges from rinsing off with a booster line to an eight step system of decontamination. Water usually does not change the product's chemical make-up. Adding 99 gallons of water to one gallon of a hazardous material simply makes it 100 gallons containing 1% of a hazardous material. However, using water to dilute has advantages over other means of decontamination because water is readily available. Using soap or other cleansing agents with water can remove many hazardous products. It is difficult to contain dilution run- off, but it is essential to make every effort t control the run-off. Run-off will eventually flow to some other site, transferring the problem to someone else.



Chemical Neutralization or Degradation

Chemical neutralization is advantageous because it reduces the product's hazard level. The disadvantage is the time involved to determine, obtain, and mix the correct neutralizer. Even an educated guess as to the correct neutralizing solution could cause the incident to worsen. Technical help from the manufacturer is usually helpful. Some neutralizing agents include household bleach, hydrated lime slurry, and liquid detergents.



Absorption

Absorption is usually for tools and equipment - not people. However, in a pinch, dusting a victim with dirt, sand, limestone, or other absorbing material, and later brushing it off, might reduce contamination. Absorption is an effective containment method and should be used in certain situations.

ABSORPTION

Picking up the material

soil, clay, Speedi-dry

does not change the hazards

Isolation and Disposal (for equipment only)

When equipment or materials cannot be safely cleaned, they should be disposed of properly. Examples of such equipment includes ropes, hoses, some wood-handled tools, disposable suits, etc.

ISOLATION

equipment that cannot be deconned

remove for later disposal

Use of Decontamination Solutions

Decontamination is not an exact science, therefore, choosing a decon solution can be controversial. Decontamination soulutions are usually solutions of water and chemical compounds designed to react with and neutralize specific contaminants. Consideration must be given to the temperature of the liquid and contact time to assure complete neutralization.

When a **known material** is encountered, the chemical manufacturer or Agency for Toxic Substances Disease Registry (ATSDR, 404-488-4100) should be contacted for specific decontamination instructions. Many departments only use detergent and water for decontamination of personnel dealing with an **unknown material.**

See Appendix C for 5 decon solutions and their uses!

In-Depth Decontamination Procedure

The final stages of the decontamination process should be included in the incident's termination phase. During the final decontamination phase, all personnel and equipment entering the hot or warm zone are properly decontaminated. The incident commander must:

account for and properly dispose of all decontamination solutions and contaminated run-off

prepare equipment that cannot be decontaminated for proper disposal

equipment should be tightly bagged for thourough cleaning back at the station or predetermined area

During the final step of decontamination, local or state health officials or EPA personnel should be consulted to determine final disposal methods.

Special Decontamination Considerations

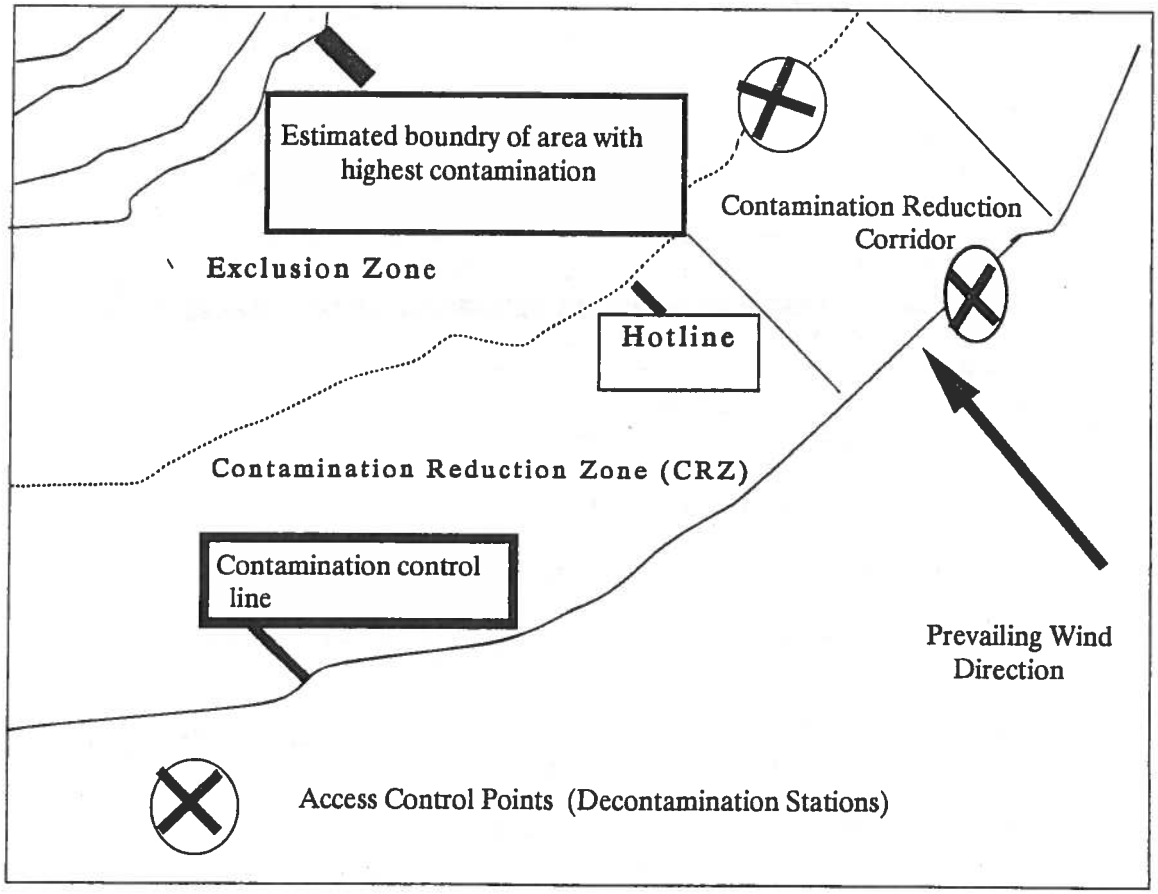
Instruct victims to be especially mindful of skin folds, hair, nails, hands, and feet when washing. Be aware of burns. Products that are not water soluble must be removed prior to a water wash. Solid of particle products may be brushed off prior to washing, however, take care not to inhale particles. A full rinse with water prior to removing equipment is advised.

When cleaning eyes, remove contact lenses and thoroughly irrigate. Be careful not to further damage the eyes. If topical anesthesia is used to allow for a vigorous cleaning, be aware that the victim will be unable to feel if more damage accidentally occurs.

It is important to contain run-off from decon pools. Many decon pools are inflatable, with rigid sides, and are made of either plastic or metal. Protect the bottom of plastic pools. Control the spray of hoses by using flow reducers and low spray nozzles. People will wash more thoroughly and longer if warm water is used.

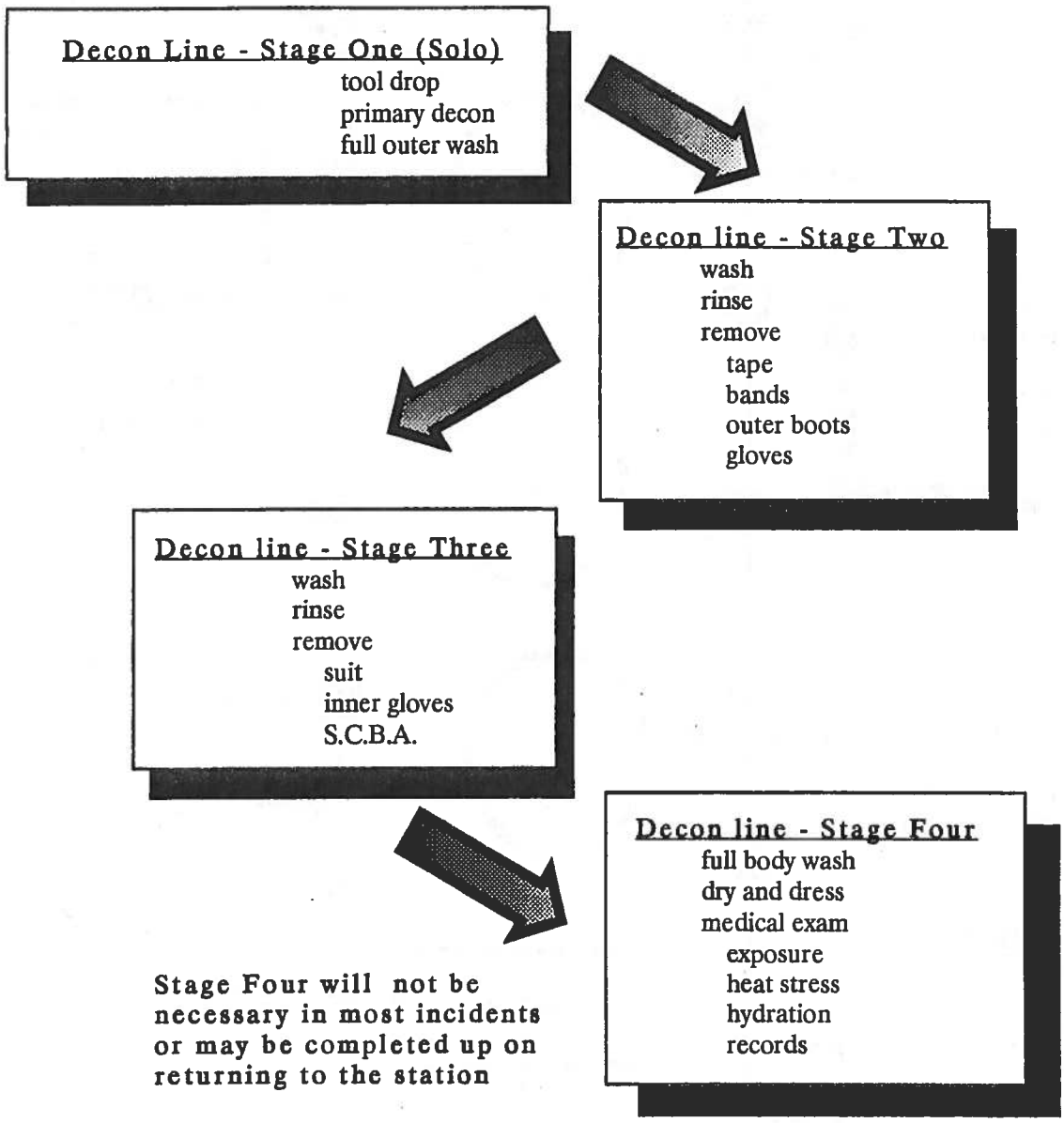
DECON CONSIDERATIONS

- levels of protection
- weather
- terrain
- location
- amount of decon required
- time of day
- day of week

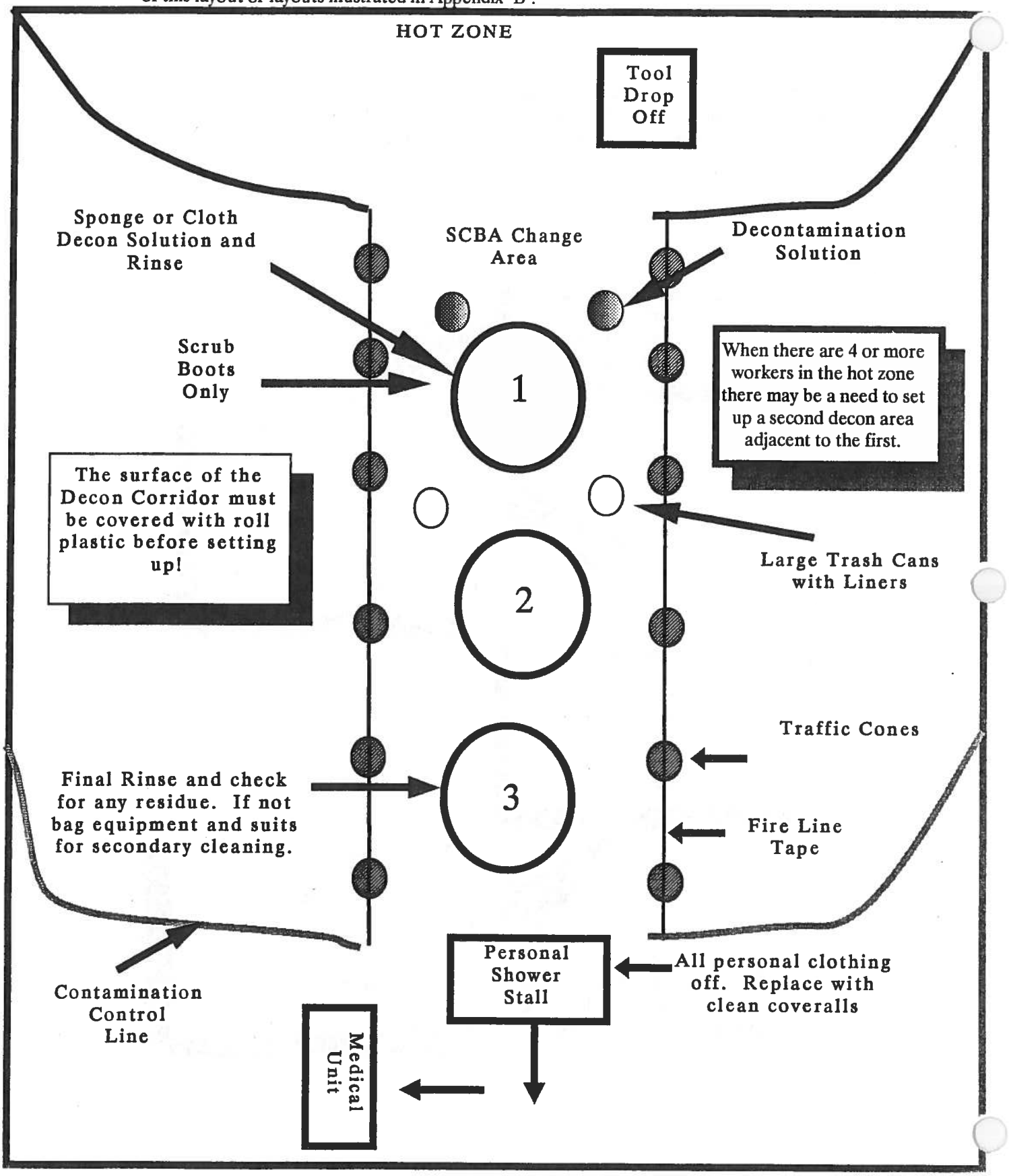


Layout of Personnel Decontamination Station (PDS)

Once the hot line section of the exclusion area boundary has been established, the personnel decontamination station (PDS) should be set up. The four basic stages of decon are shown below.



Minimum layout of the personnel decontamination station (PDS) is illustrated below. This layour would be followed for smaller incidents. Larger incidents may require multiple duplictions of this layout or layouts illustrated in Appendix "B".



Emergency Medical Treatment, as required, and Rehabilitation shall be carried out in the Support Zone.

Rehabilitation

The welfare of personnel is often overlooked after a major emergency. After participating in a physically and emotionally demanding incident, personnel's ability to respond to another assignment should be evaluated. Often incident personnel are given a short rest period and offered food with poor nutritional value, such as doughnuts and cookies. After returning to the station, work will continue on cleaning the equipment to insure everything will be available for the next disaster.

It is not necessary for personnel to have a hot meal and full night of sleep after each major incident. However, during the termination phase of an incident, take time to adequately assess the ability of personnel to respond to another incident. The following procedures are advocated:

provide a minimum 30 minute rest period for personnel who experience extreme physical exertion or emotional pressure

provide nutritional food and liquid supplements

have personnel evaluated by medical personnel for possible chemical exposure and physical exhaustion. Vital signs should be taken when they arrive at rehabilitation and as they are released for reassignment

provide shower facilities and fresh clothing

evaluate personnel for signs of emotional distress. This can be done by a member of the critical incident debriefing team or EMS provider

These minimal steps will insure personnel's effectiveness and minimize long term health effects.

Medical Screening

Medical exams and taking blood samples of personnel who were possibly exposed during the incident should be completed in the termination phase. Blood samples are often the only way to determine if personnel were exposed to the chemical involved. It is recommended that high risk personnel, such as HMRT members, give yearly blood samples at local hospitals or a similar lab facility. The stored sample can be compared to the post-exposure sample. With such samples, the full extent of exposure can be determined while providing vital information for appropriate medical care.

Exposure Reporting

Exposure reporting, which began during the last decade, has provided another tool for evaluating health risks encountered during emergency response. Use of exposure reporting allows an emergency responder to document and track dangerous exposure throughout his/her career. Personnel should report any incident in which he may have been exposed to a harmful substance. This includes EMS calls, fire response and, of course, a haz-mat incident.

An excellent time to fill out the report form is during the termination phase of the incident.

Post-Incident Analysis

Due to the complex and chaotic nature of emergency response, very few incidents go perfectly. A post- incident analysis is probably the best way to ascertain if an incident was handled properly. When used properly, the post-incident analysis can be, not only a learning experience, but a road map to your next emergency.

Post-incident analysis is a comprehensive review of the emergency. It should include input from each participating agency. This formal critique should be conducted by the agency having jurisdiction.

Unfortunately, when response does not go well, there is a tendency to place the blame on a particular fire company or outside agency. This blame sometimes shows up on the post-incident analysis. Conversely, the critique should not overlook problems that did exist.

The post-incident analysis should be a positive learning experience. It can be used to make future incidents more productive, safe, and manageable. A responsible party from each agency should discuss what part the agency played, why it was done, and how it may be done more effectively in the future. If deficiencies are noted during the critique, it is imperative they be addressed prior to the next incident. It will only frustrate participating agencies and personnel if problem areas are defined in the incident analysis, but not addressed and/or resolved.

Guideline Hazardous Materials Incident Management	Effective Date 09/30/93	Rescinds
Reference ***Surviving the Hazardous Materials Incident*** ***Emergency Resources***		Number

APPENDIX

A

IV. TAKING THE CALL

Get all pertinent information available at the time of the call.

DISPATCHER CHECK SHEET

1. Get Location
   A. Life or Exposure Hazard
      1. X-Ray
      2. Downtown
      3. Isolated Area
      ☐ 4. Railroad Tracks
      ☐ 5. Other

2. Determine if Rescue is Necessary
   ☐ 1. Driver Trapped
   ☐ 2. Multiple Victims from Fumes
   ☐ 3. Plant Fire with Victims
   ☐ 4. other

3. Type of Situation (If Hazardous Material Involved)
   Start Proper Response as Directed By Individual SOG's

A. Get Identification from Witness (correct spelling and two of the following)
   1. DOT # _____
   2. Placard _____
   3. Stenciled Name _____
   4. Name of Driver or Plant Worker _____
   5. GATX#, STCC#. etc _____
   6. Name of Carrier _____

B. Is Material Leaking?
   ☐ 1. Leak
   ☐ 2. Spill
   ☐ 3. Gas Release
   ☐ 4. Fire
   ☐ 5. Explosion
   ☐ 6. other

C. Form of Leaking Material
   ☐ 1. Gas
   ☐ 2. Liquid
   ☐ 3. Solid
   ☐ 4. Radioactive
   ☐ 5. other

D. Quantity of Spill
   ☐ 1. 30,000 gallon
   ☐ 2. 55 gallon Drum
   ☐ 3. One gallon Container
   ☐ 4. 20 pound Bag
   ☐ 5. other

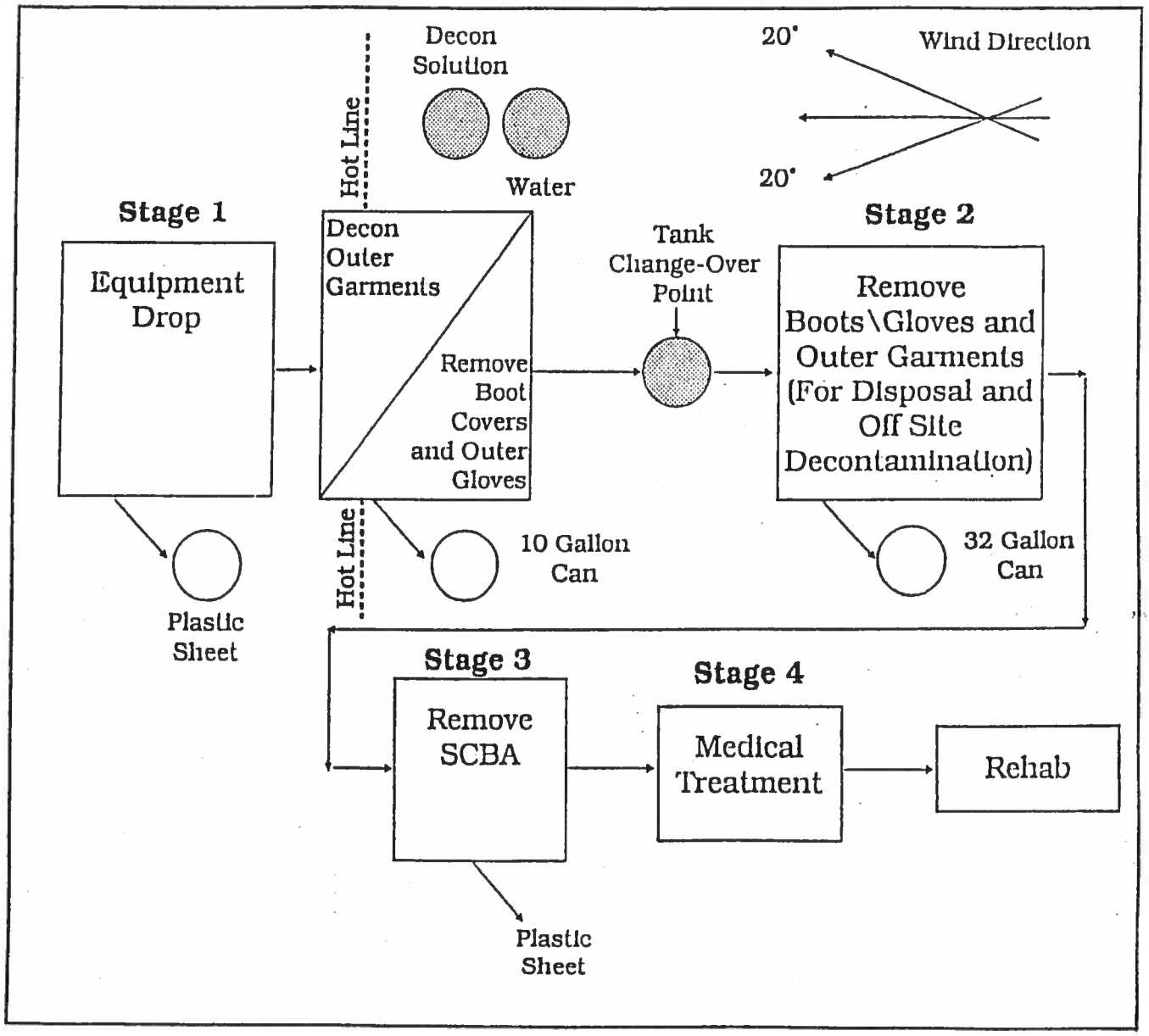
E. Leak Characteristics
   ☐ 1. Color of Flame
   ☐ 2. Odor
   ☐ 3. Color of Substance
   ☐ 4. Color of Vapor Clouds
   ☐ 5. Itching, Burning
   ☐ 6. any other characteristics

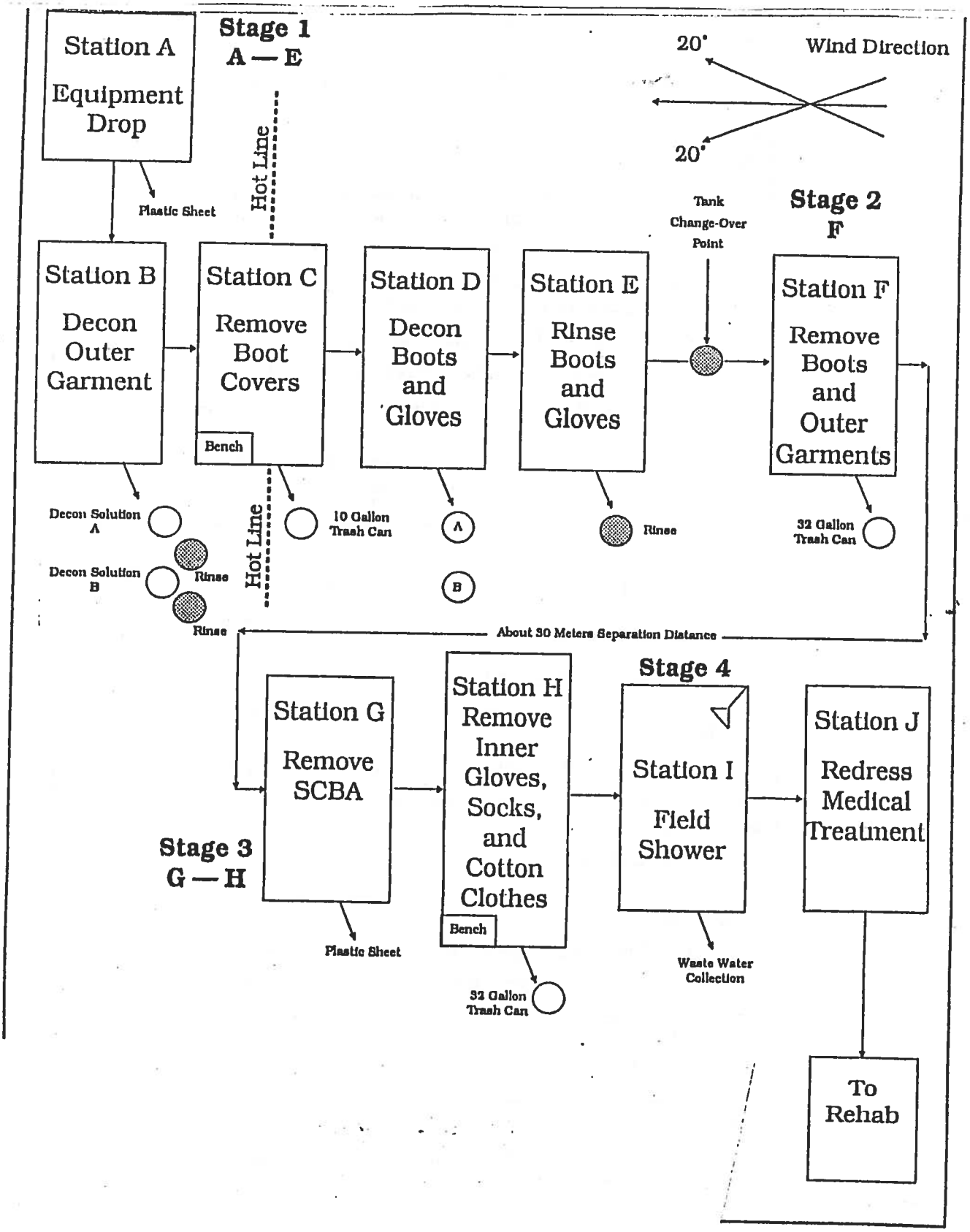
F. All above information must be recorded for later disemmination to responding units.

G. Maintain Written/Recorded Log of All Activity

APPENDIX

B


Decon Solution
Water
Hot Line
20°
Wind Direction
20°
Stage 1
Equipment Drop
Decon Outer Garments
Remove Boot Covers and Outer Gloves
Tank Change-Over Point
Stage 2
Remove Boots\Gloves and Outer Garments (For Disposal and Off Site Decontamination)
Hot Line
10 Gallon Can
32 Gallon Can
Plastic Sheet
Stage 3
Remove SCBA
Stage 4
Medical Treatment
Rehab
Plastic Sheet


Station A
Equipment Drop
Stage 1
A — E
Plastic Sheet
Hot Line
20°
Wind Direction
20°
Tank
Change-Over
Point
Stage 2
F
Station B
Decon Outer Garment
Station C
Remove Boot Covers
Bench
Station D
Decon Boots and Gloves
Station E
Rinse Boots and Gloves
Station F
Remove Boots and Outer Garments
Decon Solution A
Decon Solution B
Rinse
Rinse
Hot Line
10 Gallon Trash Can
A
B
Rinse
32 Gallon Trash Can
About 30 Meters Separation Distance
Stage 4
Station G
Remove SCBA
Station H
Remove Inner Gloves, Socks, and Cotton Clothes
Station I
Field Shower
Station J
Redress Medical Treatment
Stage 3
G — H
Plastic Sheet
Bench
32 Gallon Trash Can
Waste Water Collection
To Rehab

Decontamination Stations for Maximum PDS

Station A

— plastic ground sheet on which field equipment is dropped by returning members of the work party

Station B

— washtub filled with decon solution A (A solution containing 5% sodium carbonate and 5% trisodium phosphate.)

— second washtub filled with rinse solution

— third washtub filled with decon solution B (A solution containing 10% calcium hypochlorite.)

— fourth washtub filled with rinse solution

— equip each washtub with a large sponge and brush

Station C

— bench or stool for sitting when removing boot covers

— plastic lined 10 gallon pail for disposal of boot covers

Station D

— two 10 gallon buckets filled with decon solution A and B

Station E

— 10 gallon bucket filled with rinse solution

Station F

— plastic lined 32 gallon trash can for rubber items

Station G

— plastic sheet

Station H

— bench or stool for personnel

— plastic lined 32 gallon trash can for cloth items

Station I

— field shower set-up

Station J

— redressing and medical treatment station. This station defines the boundary between the contamination control area and clean area.

APPENDIX

C

Decontamination Solutions

Decontamination soulutions should be designed to react with and neutralize the specific, potential contaminants involved in an incident. However, since the contaminants at an incident may be unknown in some cases, it is necessary to use a decontamination solution that may be effective for a variety of contaminants. Several of these general purpose decontamination solutions are listed below. Technical advise should always be obtained prior to attempting decontamination by chemical degradation.

Solution	Ingredients	Hazard Suspected
A	A solution containing 5% sodium carbonate (Na_2CO_3) and 5% trisodium phosphate (Na_3PO_4): To two gallons of water, add one pound of sodium carbonate (soda lime) and one pound of trisodium phosphate. Stir until evenly mixed.	Inorganic Acids Metal Processing Wastes Heavy Metals: Mercury, lead cadium, etc Solvents and organic compounds ex. Trichloroethylene, Chloroform, abd Toluene, PBB's, and PCB's
B	A solution containing 10% calcium hypochlorite ($Ca(Clo)_2$): To two gallons of water, add two pounds of calcium hypochlorite. Stir with a wooden or plastic stirred until evenly mixed.	Pesticides, Fungicides, Chlorinated Phenols, Dioxins, PCP's, Cyanides, Ammonia and other non-acidic inorganic wastes.
C	A solution containing 5% trisodium phosphate (Na_3PO_4): To two gallons of water, add one pound of trisodium phosphate. Stir until evenly mixed/	Solvents and organic compounds ex. Trichloroethylene, Chloroform, abd Toluene, PBB's, and PCB's Oily, greasy unspecified wastes
D	A dilute solution of hydrochloric acid (HCl): To two gallons of water, add one-third cup of concentrated Hydrochloric acid. Stir with a wooden or plastic stirrer.	Inorganic bases, Alkali, and caustic waste
E	A solution containing dishwashing liquid, or other household detergent--such as Tide.	**General cleaning, removal of previous hazardous decon solutions (This method is preferred by EPA and should be sufficient in most cases)!**