SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Purpose

The purpose of this guideline is to provide basic information about the Albuquerque Fire Department's overall approach to hazardous materials response.

Policy

Hazardous materials incidents may involve fires, spills, transportation accidents, acts of terrorism, explosions, chemical releases, and other events. These incidents range from relatively minor events to major incidents that may require the evacuation of thousands of people for weeks at a time. The Albuquerque Fire Department's Hazmat Program is responsible for providing the community with the equipment, facilities, and trained personnel to respond to hazardous materials emergencies, and for maintaining response capabilities to areas outside the immediate jurisdiction of the department. All personnel shall familiarize themselves with the information provided in this introduction.

I. Hazard Classification System

A. The Department of Transportation (DOT) has categorized hazardous materials into 9 basic hazard classes. Divisions are sub-classes that identify specific groups of materials within a particular hazard class. The following is a list of the 9 hazard classes and their divisions (sub-classes):

1. (Class 1) **Explosives**

Division 1.1	Explosives with a mass explosion hazard
Division 1.2	Explosives with a projectile hazard
Division 1.3	Explosives with predominantly a fire hazard
Division 1.4	Explosives with no significant blast hazard
Division 1.5	Very insensitive explosives with a mass explosion hazard
Division 1.6	Extremely insensitive articles

2. (Class 2) **Gases**

Division 2.1	Flammable gases
Division 2.2	Non-flammable, non-toxic gases
Division 2.3	Toxic gases

3. (Class 3) **Flammable and Combustible Liquids**

4. (Class 4) **Flammable Solids / Spontaneously Combustible materials / Dangerous when wet / Water-reactive substances**
   - Division 4.1 Flammable solids
   - Division 4.2 Spontaneously combustible materials
   - Division 4.3 Water-reactive substances / Dangerous when wet materials

5. (Class 5) **Oxidizing Substances and Organic Peroxides**
   - Division 5.1 Oxidizing substances
   - Division 5.2 Organic peroxides

6. (Class 6) **Toxic & Infectious Substances**
   - Division 6.1 Toxic substances
   - Division 6.2 Infectious substances

7. (Class 7) **Radioactives**

8. (Class 8) **Corrosives**

9. (Class 9) **Miscellaneous Hazardous Materials / Products, Substances or Organisms**

II. Identification and Recognition

A. Hazardous materials must be identified before any action can be taken to control the incident. Failure to properly identify the materials involved will only make the situation more hazardous. Several types of information sources are available to help responders identify hazardous materials.

1. Placards – Placards are 10 ¾ inch diamond-shaped symbols that must be applied to each side and end of a motor vehicle, rail car, freight container, or portable tank container carrying hazardous materials. The color, symbol, and UN hazard class numbers on placards alert responders to the hazards of the material. The 4-digit UN ID number may be shown on the placard or on an adjacent orange panel displayed on the ends and sides of a cargo tank, vehicle, or rail car.

2. Labels – Labels are 4 inch diamond-shaped symbols applied to packages. Every DOT classified hazardous material shipment must be marked with the appropriate labels unless otherwise specified.

3. Shipping papers - DOT regulations require that shipping papers must accompany shipments of hazardous materials and hazardous wastes. The shipping papers typically identify the shipping name, type of packaging, and total quantity of the shipment.

4. Material Safety Data Sheets (MSDS)- MSDS information is completed by the manufacturer and regulated by the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA). Information like the material name, physical and chemical data, the manufacturer's name, and special precautions are typically listed.

5. CHEMTREC – The Chemical Transportation Emergency Center is a 24-hour, 7 day a week emergency communication service that can provide valuable information (1-800-424-9300) in the event of a hazardous materials emergency.

6. Emergency Response Guidebook – A guidebook published by the Department of Transportation carried on all apparatus. The ERG was designed to assist first responders during the initial phase of a hazmat incident.

7. NFPA 704 System - The National Fire Protection Association (NFPA) 704 marking system is primarily designed for fixed facilities like buildings, storage tanks, or individual rooms where hazardous materials identification is necessary. This system also uses a diamond-shaped symbol, colors, and numbers, to alert responders to the presence of hazardous materials. Each hazard poses a varying degree of danger and is rated on a scale from 0 (least hazardous) to 4 (most hazardous).

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NFPA 704 System

Flammability (Red)

4 Extremely flammable

3 Ignites at normal temperatures

2 Ignites when moderately heated

1 Must be preheated to burn

0 Will not burn

Health (Blue)

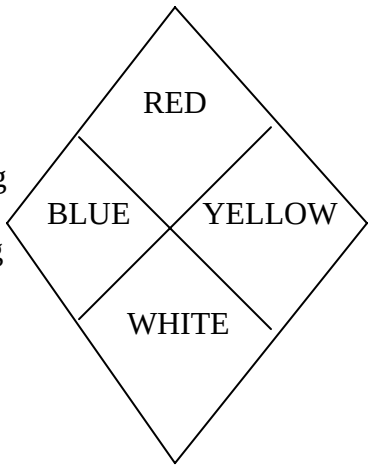
4 Too dangerous to enter vapor or liquid

3 Extremely dangerous- use full protective clothing

2 Hazardous – use breathing apparatus

1 Slightly hazardous

0 Like ordinary material



Reactivity (Yellow)

4 May detonate; vacate area if materials exposed to fire

3 Strong shock or heat may detonate

2 Violent chemical change possible; use streams at a distance

1 Unstable if heated; use normal precautions

0 Normally stable

Special Information (White)

~~W~~ Water Reactive

OXY Oxidizing chemicals

8. Pipeline markings – Any place an underground pipeline crosses a mode of transportation, the pipeline owner is required to place a sign identifying the owner, pipeline contents, and emergency contact numbers.

9. Container markings – Depending on the type of hazardous material, some containers are required to have hazard information labels or information that will assist responders with identification stenciled directly onto containers.

10. Military Warning System – Whenever possible, the military uses the DOT placarding system, but in some cases, it may employ its own system. The Emergency Response Guidebook contains contact numbers for incidents involving materials being shipped by, for, or to the Department of Defense.

11. National Response Center - The NRC, which is operated by the U.S. Coast Guard, receives reports required when dangerous goods and hazardous substances are spilled. Federal law requires that anyone who releases into the environment a reportable quantity of a hazardous substance (including oil when water is, or may be affected) or a material identified as a marine pollutant, must immediately notify the NRC. When in doubt as to whether the amount released equals the required reporting levels for these materials, the NRC should be notified. Contact numbers listed in the ERG.

12. Other sources – Responders can obtain valuable information by observing the occupancy or location where the incident occurs, the types of containers involved, interviewing bystanders and responsible parties, obtaining a manufacturer or trade name of the material involved, or making general observations at the scene.

III. Responder Levels

A. There are basic training levels for responders identified by both OSHA and by the NFPA. NFPA 472 ***Professional Competence of Responders to Hazardous Materials Incidents*** (2002 edition, Annex E) lists the following responder levels:

1. *Awareness Level* – First responders at the awareness level are those persons who, in the course of their normal duties, can be the first on the scene of an emergency involving hazardous materials. First responders at the awareness level are expected to recognize the presence of hazardous materials, protect themselves, call for trained personnel, and secure the area.

2. *Operations Level* – First responders at the operations level are those persons who respond to releases or potential releases of hazardous materials as part of the initial response to the incident for the purpose of protecting nearby persons, the environment, or property from the effects of the release. They should be trained to respond in a defensive fashion to control the release from a safe distance and kept it from spreading.

3. *Technician Level* – Hazardous materials technicians are those persons who respond to releases or potential releases of hazardous materials for the purpose of controlling the release. Hazardous materials technicians are expected to use specialized chemical protective clothing and specialized control equipment.

4. *Command Level* – The incident commander is that person who is responsible for all decisions relating to the management of the incident. The incident commander is in charge of the incident site.

IV. Basic Operational Approach to Hazmat Incidents

A. The Hazmat tactical priorities acronym S.I.N.C.I.A.P.C.P.D.D.D. is essentially a “mental blueprint” that provides responders with a systematic approach to hazmat incidents regardless of the size, type, or complexity of the incident. Instead of becoming overwhelmed or distracted by non-critical issues, the tactical priorities acronym helps responders stay focused on the priorities of the incident and the critical tasks that need to be accomplished in order to protect life, property, and the environment.

1. S = Safety

2. I = Isolation

3. N = Notification

4. C = Command and Management

5. I = Identification and Hazard Assessment

6. A = Action Planning

7. P = Public Protective Actions

8. C = Containment and Control

9. P = Personal Protective Equipment

10. D = Decontamination

11. D = Disposal

12. D = Documentation

B. Hazmat Task Force Response

1. The majority of Albuquerque Fire Department personnel are trained to the First Responder Operations Level and are primarily trained to conduct defensive-oriented operations.

2. Hazmat Task Force personnel are certified as Technicians and have received additional training in hazard assessment, chemical research, action planning, the selection and use of personal protective equipment (PPE), atmospheric monitoring, decontamination, scene management, both offensive and defensive strategies and tactics, and various laws, regulations, and standards affecting response to hazmat incidents.

3. Currently there are two Hazmat Task Force stations in the Albuquerque Fire Department: Fire Station 4 and Fire Station 13.

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I. Background: Laws, Regulations, and Standards

A. There are several corresponding laws, regulations, and standards that impact response to hazardous materials incidents.

1. Laws are created by Congress or state legislatures and typically provide broad-based goals and objectives and establish penalties for non-compliance. Examples of this are the Clean Water Act (CWA) and the Superfund Amendments and Reauthorization Act (SARA).

2. Regulations are created by federal and state agencies as methods of providing guidelines for complying with laws. An example of a Federal hazmat regulation is the Hazardous Waste Operations and Emergency Response regulation known as HAZWOPER (29 CFR 1910.120). The Hazardous Materials Emergency Response Plan (HMER Plan) is an example of a state regulation.

3. Consensus standards are developed through professional organizations or trade associations and may be adopted by government agencies, corporations, and other organizations. Three of the most important consensus standards affecting hazardous materials response are:

a. NFPA 471(Recommended Practices for Responding to Hazardous Material Incidents)

b. NFPA 472 (Standard for Professional Competence of Responders to Hazardous Materials Incidents)

c. NFPA 473 (Standard for Professional Competence of EMS Personnel Responding to Hazardous Materials Incidents)

II. First Responders Operations Level: Description

A. NFPA 472 *Professional Competence of Responders to Hazardous Materials Incidents* E.1.2 (Annex E) defines First Responder at the Operational Level as "Those persons who respond to releases or potential releases of hazardous materials as part of the initial response to the incident for the purpose of protecting nearby persons, the environment, or property from the effects of the release. They should be trained to respond in a defensive fashion to control the release from a safe distance and keep it from spreading."

B. NFPA 472 *Standards for Professional Competence of Responders to Hazardous Materials Incidents* identifies core competencies for the first responder at the operational level. In addition to being competent at the first responder awareness level, personnel trained to the first responder operations level shall be required to perform the following tasks:

1. Analyze a hazardous materials incident to determine the magnitude of the problem in terms of outcomes by completing the following tasks:

    a. Survey the hazardous materials incident to identify the containers and materials involved, determine whether hazardous materials have been released, and evaluate surrounding conditions

    b. Collect hazard and response information from MSDS; CHEMTREC/ CANUTEC / SETIQ; local, state, and federal authorities; and shipper / manufacturer contacts

    c. Predict the likely behavior of a material as well as its container

    d. Estimate the potential harm at a hazardous materials incident

2. Plan an initial response within the capabilities and competencies of available personnel, personal protective equipment, and control equipment by completing the following tasks:

    a. Describe the response objectives for hazardous materials incidents

b. Describe the defensive options available for a given response objective

c. Determine whether the personal protective equipment provided is appropriate for implementing each defensive option

d. Identify emergency decontamination procedures

3. Implement the planned response to favorably change the outcomes consistent with the local emergency response plan and the organization's standard operating procedures by completing the following tasks:

    a. Establish and enforce scene control procedures including perimeters, emergency decontamination, and communications

    b. Initiate an incident management system (IMS) for hazardous materials incidents

    c. Don, work in, and doff personal protective equipment provided by the authority having jurisdiction

    d. Perform defensive control functions identified in the plan of action

4. Evaluate the progress of the actions taken to ensure that the response objectives are being met safely, effectively, and efficiently by completing the following tasks:

    a. Evaluate the status of the defensive actions taken in accomplishing the response objectives

    b. Communicate the status of the planned response

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III. Hazmat Tactical Priorities Acronym: S.I.N.C.I.A.P.C.P.D.D.D.

A. The Hazmat Tactical Priorities acronym is essentially a "mental blueprint" that provides responders with a systematic approach to hazmat incidents regardless of the size, type, or complexity of the incident.

1. Instead of becoming overwhelmed or distracted by non-critical issues, the tactical priorities acronym helps responders stay focused on the priorities of the incident and the critical tasks that need to be accomplished in order to protect life, property, and the environment.

B. **S.I.N.C.I.A.P.C.P.D.D.D.** Overview

S = SAFETY
I = ISOLATION
N = NOTIFICATIONS
C = COMMAND & MANAGEMENT
I = IDENTIFICATION & HAZARD ASSESSMENT
A = ACTION PLANNING
P = PROTECTIVE EQUIPMENT
C = CONTAINMENT & CONTROL
P = PUBLIC PROTECTIVE ACTIONS
D = DECONTAMINATION
D = DISPOSAL
D = DOCUMENTATION

C. Hazmat Tactical Acronym: Description

1. Safety - Approach any incident involving hazardous materials from a direction that is upwind, uphill, and upstream from the incident. While enroute, attempt to obtain as much information as possible from Dispatch. This information could influence strategic and tactical decisions made during the initial hazard assessment by first arriving units.

2. Isolation - One of the initial tasks at any hazardous materials incident is establishing an initial perimeter. Isolating the area and denying entry will help to prevent further exposure to the materials involved and will help reduce the spread of any potential contamination. Denial of access to the hazard area includes police, media, employees, ambulance personnel, and other responders. The ERG (Emergency Response Guidebook) contains recommendations that will help you determine appropriate isolation distances and protective actions even if the identity of the material is unknown.

3. Notifications - The New Mexico State Police ERO is the designated incident commander for hazmat incidents in the State of New Mexico.

    a. Minor hazmat incidents that can be safely managed by local responders will only require notification of the New Mexico State Police. The initial incident commander should request any additional resources as needed (Squad, Hazmat Task Force, P.D., etc.).

4. Command and Management - Although the New Mexico State Police ERO is the designated incident commander for hazardous materials incidents occurring in New Mexico, the local responders will typically manage the incident unless the incident requirements exceed the capabilities and resources of the local responders. If an ERO responds, AFD hazmat personnel will usually manage the operational aspects of the incident working under the ERO who has overall responsibility for the incident.

5. Identification and Hazard Assessment -Hazardous materials must be properly identified in order to assess the hazards presented by the emergency. The material must be identified before any action options can be considered. Failure to properly identify the materials involved can significantly increase the hazards to the public, responders, property, and the environment. The ERG contains valuable information that can assist responders with the initial identification of the materials involved.

6. Action Planning - Action planning involves clearly identifying the nature, size, and complexity of the problem, the evaluation of the adequacy of resources available to solve the problem, the wisdom to know when to ask for help early, and the use of these resources to safely manage the incident. Good action planning also involves the consideration of a non-intervention strategy as an action option (isolation, denying entry, letting incident run its course).

7. Personal Protective Equipment - The primary exposure routes are (1) inhalation (2) ingestion (3) absorption and (4) injection. Proper selection of personal protective equipment (PPE) must include consideration of the exposure routes of the materials involved. There are 4 levels of personal protective equipment (PPE).

    a. Level A – Highest level of respiratory and skin protection (Operations Level personnel are not permitted to work in Level A PPE)

    b. Level B – High level of respiratory protection; less skin

    c. Level C – Air Purifying Respirator (APR); modest skin protection

    d. Level D – Ordinary work uniform (Firefighter turnout gear is considered Level D PPE)

8. Containment and Control - There are 3 basic strategies for containment and control.

    a. Non-intervention (isolate, deny entry, let incident run its course)

    b. Defensive (actions focused on containment)

    c. Offensive (actions requiring control measures performed by hazmat Technicians)

9. Public Protective Actions - Due consideration must be given to the material involved, the population threatened, the resources and capabilities of responders, time involved to accomplish the evacuation, current and predicted weather, ability to communicate with the public, and whether or not special populations will have to be evacuated (hospitals, institutions, etc.). There are 2 types of actions taken to protect the public:

    a. Evacuation (removing people from threatened area to safe area)

    b. Shelter-in-place (keeping people inside a protective structure)

    c. Limited evacuation may be appropriate in some situations

10. Decontamination - The goal of decontamination is to prevent the spread of contamination by removing hazardous materials from people and equipment.

    a. Primary decon is the standard layout set up for emergency responders entering hazardous environments

    b. Emergency decon is a type of rapid, urgent decontamination that could be as simple as using a hoseline off of an engine company to conduct wet decon

    c. *Mass* decon is a term used to describe the decontamination of a large number of victims, involves a large number of resources, and requires the assistance and cooperation of multiple agencies.

    d. Decon can be either wet or dry depending on the type of material involved.

11. Disposal - It is the Albuquerque Fire Department's policy not to take possession or dispose of hazardous materials. The designated responsible party for the incident must make arrangements to handle this phase of incident operations.

12. Documentation - Hazardous materials incidents typically involve liability issues. Responders are held accountable for their actions regarding the protection of life, property, and the environment. Proper documentation is essential and provides valuable information about the incident that may be used in a legal setting, in training scenarios, or entries into the medial histories of responders for future reference.

IV. First Responder Operations Level: Defensive Actions

A. Defensive actions are those actions taken at an incident that do not place responders in direct contact with the materials involved.

B. Defensive actions are designed to stop, slow, redirect, or control a hazardous materials release from a safe location.
   1. Operating remote shut-offs to stop or slow product release;

   2. Diking ahead of a spill to prevent material from entering sewers or storm drains;

   3. Vapor suppression activities; foam application on flammable liquid spills and vapor cloud dispersion with fog streams;

   4. Cooling off flame impinged pressurized containers with hoselines or unattended monitors.

APPENDIX A

HAZMAT ICS CHECKLISTS AND FORMS

HAZMAT ICS CHECKLIST

ICS Position Title: ***INCIDENT COMMANDER***

Major Responsibility: Overall responsibility for management of the incident.

Duty Checklist:

_____ 1. Formally assume command

_____ 2. Evaluate current actions and organization

_____ 3. Assign Incident Safety Officer

_____ 4. Assign Hazmat Sector Officer

_____ 5. Prepare Incident Action Plan

_____ 6. Approve all ordering / releasing of resources

_____ 7. Approve news releases to media through the Information Officer

_____ 8. Ensure pre-entry briefings, safety assessments, and planning meetings are conducted

_____ 9. Conduct post-incident review

Forms checklist:

1. Incident Action Plan

HAZMAT ICS CHECKLIST

ICS Position Title: ***HAZMAT SECTOR OFFICER***

Major Responsibility: Responsible for managing the activities of the Hazardous Materials Sector.

Duty Checklist:

_____ 1. Obtain briefing from the Incident Commander

_____ 2. Confirm Control Zones and access points have been identified

_____ 3. Coordinate and manage overall activities of Entry, Technical Reference, Decon, Site Access Control, and Medical Unit

_____ 4. Participate in developing Incident Action Plan

_____ 5. Evaluate and recommend public protective actions to the Incident Commander

_____ 6. Ensure *Site Safety Plan* is prepared by Assistant Safety Officer, and a pre-entry safety briefing is conducted

_____ 7. Ensure that proper PPE is selected and used

_____ 8. Ensure current and future weather predictions are obtained

HAZMAT ICS CHECKLIST

ICS Position Title: ***ASSISTANT SAFETY OFFICER***

Major Responsibility: Responsible for advising the Hazmat Sector Officer on health and safety issues, and has the emergency authority to alter, suspend, or terminate, any unsafe acts that present an immediate threat to on-scene personnel.

Duty Checklist:

_____ 1. Obtain briefing from the Incident Safety Officer

_____ 2. Report to the Incident Safety Officer, but work closely with the Hazmat Sector Officer

_____ 3. Prepare *Site Safety Plan*

_____ 4. Advise the Hazmat Sector Officer of any situations that may present a threat to responders

_____ 5. Monitor site safety

_____ 6. Ensure that required (transport capable) EMS is on scene, and coordinate related safety activities with the Hazmat Sector Officer

Forms checklist:

1. Site Safety Plan

HAZMAT ICS CHECKLIST

ICS Position Title: ***TECHNICAL REFERENCE UNIT LEADER***

Major Responsibility: Responsible for providing technical information and assistance to the Hazmat Sector Officer using various references, resources, and expertise.

Duty Checklist:

_____ 1. Provide technical information about the properties of the hazardous materials involved

_____ 2. Make recommendations regarding public protective actions, PPE, Decon, EMS, and other operational considerations

_____ 3. Provide technical information to assist in the development of the Incident Action Plan and the Site Safety Plan

_____ 4. Assist in interpreting environmental monitoring information

_____ 5. Work with various technical specialists to manage technical information about the incident

Forms checklist:

1. Hazardous Materials Data Sheet

HAZMAT ICS CHECKLIST

ICS Position Title: ***DECONTAMINATION UNIT LEADER***

Major Responsibility: Responsible for managing the elements of the Decontamination Unit as required by the Incident Action Plan.

Duty Checklist:

_____ 1. Obtain briefing from the Hazmat Sector Officer

_____ 2. Establish, identify, and mark the Contamination Reduction Corridor

_____ 3. Maintain control of the movement of personnel and equipment within the Contamination Reduction Zone

_____ 4. Coordinate the transfer of contaminated patients requiring medical attention (after Decon) to the Medical Unit

_____ 5. Coordinate activities with the Entry Leader

_____ 6. Manage the handling, storage, and transfer of known or suspected contaminated items within the Contamination Reduction Zone

_____ 7. Ensure proper decontamination for the materials involved by consulting with the Technical Reference Unit

_____ 8. Ensure appropriate PPE is utilized by Decon personnel

HAZMAT ICS CHECKLIST

ICS Position Title: ***ENTRY UNIT LEADER***

Major Responsibility: Responsible for the management of Entry and Back-up teams operating at the scene.

Duty Checklist:

_____ 1. Obtain briefing from Hazmat Sector Officer

_____ 2. Supervise Entry and Back-up operations

_____ 3. Ensure that Entry and Back-up teams have thoroughly checked PPE, monitoring equipment, and any additional equipment that is required prior to entry

_____ 4. Ensure that communications with entry and back-up teams are functioning properly prior to entry

_____ 5. Ensure that mandatory pre-entry safety briefing is conducted prior to entry

_____ 6. Ensure that primary mission, back-up mission, emergency procedures, and hand signals are understood by entry and back-up teams

_____ 7. Strive to maintain line-of-sight observation of teams operating within Hot Zone

_____ 8. Ensure that entry and back-up teams complete pre-entry and post-entry medical monitoring by Medical Unit

_____ 9. Provide the Hazmat Sector Officer with periodic progress reports

Forms checklist:

1. Entry Team Tracking form

HAZMAT ICS CHECKLIST

ICS Position Title: ***SITE ACCESS CONTROL***

Major Responsibility: Responsible for the orderly movement of all people and equipment through appropriate access points at the incident scene.

Duty Checklist:

_____ 1. Obtain briefing from the Hazmat Sector Officer

_____ 2. Utilize personnel and equipment (scene tape, traffic cones, etc.) to establish and maintain control of designated access points at scene

_____ 3. Maintain a Safe Refuge Area (if needed) for contaminated patients awaiting decontamination

_____ 4. Request additional resource needs through Hazmat Sector Officer

HAZMAT ICS CHECKLIST

ICS Position Title: ***MEDICAL UNIT LEADER***

Major Responsibility: Responsible for providing EMS to response personnel, and conducting pre-entry and post-entry monitoring of Entry and Back-up teams.

Duty Checklist:

_____ 1. Obtain briefing from Hazmat Sector Officer

_____ 2. Provide pre-entry and post-entry medical monitoring for Entry and Back-up teams

_____ 3. Consult with Technical Reference Unit regarding EMS care for chemical exposures to known or suspected material(s) involved

_____ 4. Evaluate, release or restrict team personnel according to pre-entry exclusion criteria

_____ 5. Establish and maintain Rehab at site

_____ 6. Request additional resources through the Hazmat Sector Officer

HAZMAT ICS CHECKLIST

ICS Position Title: ***STAGING AREA MANAGER***

Major Responsibility: Responsible for organizing, coordinating, and managing activities within the Staging Area.

Duty Checklist:

_____ 1. Report to appropriate command level according to incident organization

_____ 2. Establish and maintain an orderly layout of the Staging Area

_____ 3. Check in units as they arrive using the *Staging Manifest* form

_____ 4. Keep crews together and available for immediate deployment

_____ 5. Keep Command advised of the status of resources in staging

_____ 6. Respond to requests for resources

_____ 7. Demobilize Staging Area in accordance with Incident Demobilization Plan

Forms checklist:

1. Staging Area Manifest

HAZMAT INCIDENT ACTION PLAN

Date:	Incident Commander:	Page 1 of 2

SAFETY
Approach
Position Uphill / Upwind / Upstream
Identify Staging Area
ISOLATION
Use ERG: Establish Perimeter
Identify isolation & protective action distances
Deny entry / control access
NOTIFICATION
State Police
E.O.C. (if needed)
A.P.D. (Traffic, Evacuation, Security, etc.)
Additional A.F.D. units
Outside Agencies (Public Works, Red Cross, Environmental Health Dept, etc.)
COMMAND & MANAGEMENT
Establish Command / ICS
Build Hazmat Organizational Structure
Designate Safety Officer
Designate Hazmat Sector Officer
IDENTIFICATION & HAZARD ASSESSMENT
Ensure the identification of materials involved
Ensure assessment of all scene hazards
Assess resource status (current / anticipated)
ACTION PLANNING
Identify the problem (Spill? Leak? Fire?)
Identify available resources
Use available resources to solve problem
“What if we did nothing?” (Consider letting incident run its course)
PROTECTIVE EQUIPMENT
Ensure proper PPE for incident (Hazmat Sector recommendations)
Assess equipment needs (PPE, SCBA’s, lighting, fuel, rehab, etc.)

HAZMAT INCIDENT ACTION PLAN

CONTAINMENT & CONTROL
Non-Intervention Strategy
Defensive Containment Strategy
Offensive Control Strategy
PROTECTIVE ACTIONS
Shelter-in-Place Strategy (What should they do?)
Evacuation Strategy (Where will they go?)
Assess adequacy of resources required
DECONTAMINATION
Type of Decon : Wet or Dry
Primary (General layout)
Emergency Decon (Gross field decon)
Mass Decon: (Consult with Hazmat Sector Officer for layout)
DISPOSAL
Contractor required for disposal / cleanup
Incident site arrangements (Company may have contingency plan for cleanup / disposal)
DOCUMENTATION
AFD:
Cost Recovery forms
AFD Hazmat forms (Incident Action Plan / Site Safety Plan / Hazmat Data Sheets
Entry Team Tracking Form / Staging Area Manifest)
ACTION PLAN
Plan A:
Plan B:
Plan C:

SITE SAFETY PLAN

Date:	Assistant Safety Officer:	Page 1 of 3

SITE INFORMATION	
Incident Location:	
Weather Conditions:	Exposures:

ORGANIZATION	
Incident Commander:	Hazmat Sector Officer:
Operations:	Assistant Safety Officer:
Logistics:	Entry Unit Leader:
Planning:	Technical Reference:
Finance / Administration:	Decon Unit Leader:
Incident Safety Officer:	Medical Unit Leader:
Liaison Officer:	Site Access Control:
Information Officer:	

MATERIALS INVOLVED	
Materials Involved:	General Hazards of Material:

GENERAL MONITORING INFO		
% LEL (Flammable Range)	IDLH	
O2 (<19.5 % or >21.0 %)	1 – 10 ppm	Extremely toxic
CO (PPM)	0 – 100 ppm	Highly toxic
H2S (Hydrogen Sulfide)	100 – 1000 ppm	Moderately toxic
Radiological (Alpha / Beta / Gamma)	1000 - 10,000 ppm	Slightly toxic
pH (Acidic / Basic)	10,000–100,000 ppm	Practically non-toxic
Nerve / Blister Agents	> 100,000 ppm	Relatively harmless

PROTECTIVE CLOTHING	
Routes of Exposure of Material(s):	PPE Levels:
Inhalation	Level A
Ingestion	Level B
Absorption	Level C
Injection	Level D

SITE SAFETY PLAN

DECONTAMINATION	
Decon Type: Wet / Dry	PPE for Decon:
Decon Solution for Personnel:	Level A
Decon Solution for Equipment:	Level B
	Level C

COMMUNICATIONS	
Tactical Channel Used:	
Command:	Hazmat Sector Supervisor:
Operations:	Assistant Safety Officer:
Planning:	Entry Unit Leader:
Logistics:	Decon Unit:
Incident Safety Officer:	Technical Reference:

EMERGENCY COMMUNICATIONS	
Audible Warning System:	Emergency Hand Signals:
3 Short Blasts – Evacuate area	Hands Gripping Throat - Breathing problems
1 Long Blast – Stop operations	Thumbs up / down – Affirmative / negative
1 Long, 1 Short Blast – Resume operations	

IN-SUIT EMERGENCY PROCEDURES
Air problems: Disconnect / use suit air / leave area as team
Ripped / Penetrated Suit: Gather or grasp suit over hole to close, then leave area as team
Notify Entry Leader of any problems

OPERATIONAL EMERGENCY PROCEDURES
Equipment Failure:
Rescue (Back-Up Team):
Emergency Evacuation of Hot Zone:

SITE SAFETY PLAN

HEALTH

Signs & Symptoms of Exposure:

Emergency Care / Treatment:

SITE MAP

N

W E

S

HAZARDOUS MATERIALS DATA SHEET

Date:	Technical Reference (Name):	Page 1 of 3

PRODUCT INFORMATION	
Product Name:	NFPA 704: Health [ ]
Synonyms:	Flammability [ ]
UN ID #:	Reactivity [ ]
DOT Hazard Class:	Special Hazards [ ]
ERG Guide #:	Water Reactive: [ ] Yes [ ] No
Quantity of potential release:	Polymerization: [ ] Yes [ ] No

ERG INITIAL ISOLATION DISTANCES						
Initial Isolation Distances:	**If Material is Highlighted in ERG:**					
Spill:	**Small Spills**			**Large Spills**		
Leak:	Isolate	Protect		Isolate	Protect	
Fire:		Day	Night		Day	Night

REFERENCES
References Used:
(3 Minimum)

PHYSICAL PROPERTIES			
Color:			
Odor:			
Physical State:			
Boiling Point:			
Specific Gravity:			
Vapor Density:			
Vapor Pressure:			
Water Soluble:			

FLAMMABILITY			
LEL:			
UEL:			
Flashpoint:			
Ignition Temp:			
Melting Point:			
Explosion Potential:			

HAZARDOUS MATERIALS DATA SHEET

Sources Used:		Page 2 of 3

TOXICITY			
IDLH:			
TLV / PEL:			
STEL:			
Carc. / Mut. / Teratogen:			

EXPOSURE ROUTES			
Inhalation:			
Ingestion:			
Absorption:			
Injection:			

REACTIVITY			
MSST:			
(Max Safe Storage Temp)			
SADT			
(Self Accel Decomp.Temp)			
Oxidizer:			
Pyrophoric:			
Corrosive:			
pH Potential:			
Incompatibles: (Reacts with)			

RADIOACTIVITY			
Alpha:			
Beta:			
Gamma:			

PERSONAL PROTECTIVE EQUIPMENT			
Entry:			
Decon:			
Decon Recommendations:			

WEATHER INFO		
Temp:	Wind Speed:	Barometric Pressure:
Wind Direction:	Humidity:	

HAZARDOUS MATERIALS DATA SHEET

Sources Used:		Page 3 of 3

HEALTH EFFECTS

Signs & Symptoms:
(of Exposure)

Target Organs:

FIRST AID

Recommendations:

RECOMMENDATIONS

Based on Hazardous Materials Data Sheet info & level, resources, & capabilities of responders:

Strategy: Non-Intervention:

Defensive Containment:

Offensive Control:

ENTRY TEAM TRACKING FORM

(Pre / Post Entry Medical Monitoring)

Date:	Entry Leader:	Page 1 of 2

PRE-ENTRY MEDICAL MONITORING

Name:	AFD #	Temp	BP	Pulse	Resp	Wt

EXCLUSION CRITERIA:PROHIBITIONS FOR ENTRY

The following exclusion criteria is based on NFPA 471:
Temperature: > 99.5^0 F (oral) or > 100.5^0 F (core)
< 97.0^0 F (oral) or < 98.0^0 F (core)
Heart Rate: >70% of Max heart rate (Max heart rate = 220 – age)
Respirations: >24 per minute
BP: > 105 Diastolic
Assess the following:
History: Recent medical problems (chest pain, dizziness, respiratory problems, etc.)
Presence of nausea, vomiting, diarrhea, fever, upper respiratory illness within past 72 hrs
Medications: New prescription medications / over counter meds taken within past 72 hrs
Other: Alcohol within past 6 hours, pregnancy, altered mental status, skin rashes, sores
Check AFD Hazmat Personnel Qualifications Roster (List of qualified Tech level personnel)

ENTRY TEAM STATUS

Entry Personnel:	Gauge psi	On Air Time	Off Air Time	Total Time On Air

ENTRY TEAM TRACKING FORM

Date:		Page 2 of 2

POST ENTRY MEDICAL MONITORING
Benchmarks based on NFPA 471:
Monitor vital signs every 5-10 minutes until member returns to 85% of maximum pulse rate
If vital signs have not returned to within 10% of baseline, perform orthostatic vitals signs
Body weight loss > than 3% or positive orthostatic
Greater than 85% maximum pulse after 10 minutes
Temperature > than 101^0 F (oral) or > 102^0 F (core)
Other: signs / symptoms of heat related illness, nausea, vomiting, altered mental status, etc.

POST ENTRY MEDICAL MONITORING					
Name:	Temp	BP	Pulse	Resp	Weight

REHAB
Rehab
Post Entry Monitoring
Fluid Replacement
Rest

STAGING AREA MANIFEST

Date:	Staging Area Manager:	Page 1 of 1

UNITS		
Units Staged:	Assigned Time:	Clear Time:

OTHER AGENCIES

OTHER EQUIPMENT (SPECIFY)

ALBUQUERQUE FIRE DEPARTMENT
STANDARD OPERATING GUIDELINES
Explosives

SOG 5-6-02

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background
According to the DOT, explosives are "any compound or mixture, or device containing such a compound or mixture designed to explode. The result is a release of gas, heat, and pressure." After an explosion has occurred, even the remnants of explosive materials may be extremely sensitive and may present a secondary explosive hazard.

The "Cardinal Rule" of response to Class 1 Explosive materials: if the storage area or cargo compartment is involved in fire, evacuate the area immediately, stop traffic, clear the area of responders and the public for at least 1 mile in all directions, and let it burn.

Class 1 Divisions:
- 1.1 Explosives with a mass explosion hazard
- 1.2 Explosives with a projection hazard
- 1.3 Explosives with predominantly a fire hazard
- 1.4 Explosives with no significant blast hazard
- 1.5 Very insensitive explosives w/ mass explosion hazard
- 1.6 Extremely insensitive articles

Considerations:
- Exposure to heat, shock, or contamination could result in an explosion
- Fire may produce irritating, corrosive and / or toxic gases
- Request Bomb Squad when incident involves explosives or explosive devices
- Always consider the possibility of secondary devices when responding to incidents involving explosive devices

Response Objectives:

No fire
- Isolate area and establish perimeter 1/3 mile in all directions
- Request assistance from Bomb Squad
- Do not touch, move, or disturb material until Bomb Squad is consulted
- For large spills consider initial evacuation of 1/2 mile in all directions

Fire
- Request assistance from Bomb Squad
- Try to prevent fire from reaching cargo area
- If storage area or cargo compartment is involved in fire, evacuate the area immediately, stop traffic, clear the area of responders and the public for at least 1 mile in all directions, and let it burn

ALBUQUERQUE FIRE DEPARTMENT
STANDARD OPERATING GUIDELINES
Gases

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background
Gases are generally grouped into 3 basic types: compressed, liquefied, and cryogenic. Although a few gases are lighter than air, most are either heavier or have the same vapor density as air. A BLEVE (Boiling Liquid Expanding Vapor Explosion) occurs when a pressurized tank is heated to the point where the pressure exceeds the relief valve's capacity to handle the excess pressure, resulting in a violent rupture. If flammable materials are involved, they will usually ignite and produce a large fireball.

Class 2 Divisions:
2.1 Flammable gases (Propane, Butane)
2.2 Non-flammable, non-toxic gases (Nitrogen, Carbon Dioxide)
2.3 Toxic gases (Chlorine, Ammonia)

Considerations:
- All gases are asphyxiants; never enter a below grade area without supplied air
- Liquefied and cryogenic gases present a frostbite hazard
- Flammable gas vapors will travel to a source of ignition and may flash back and ignite under the right conditions
- Gases may present more than one hazard (flammable, toxic, corrosive, oxidizer, radioactive, etc.)
- Liquefied and cryogenic gases have large expansion ratios and could produce sizeable vapor clouds
- A BLEVE occurs when a contained liquid is heated well above its boiling point causing a violent container failure

Response Objectives:

No fire
- Identify material as soon as possible to determine primary hazards
- Determine vapor density of material (heavier or lighter than air)
- Use the ERG to help determine initial isolation distances and protective actions; evacuate if necessary
- Secure sources of ignition
- If possible, turn leaking containers so gas escapes rather than liquid

Fire
- Evacuate area to at least 1/ 2 mile
- Do not extinguish fire unless gas supply can be shut off
- Fight fire from maximum distance with unmanned monitors; if this is impossible, withdraw from area and let it burn
- Withdraw immediately in case of rising sound from relief valves, discoloration of tank, or pinging sounds (container stress), anticipate BLEVE

ALBUQUERQUE FIRE DEPARTMENT
STANDARD OPERATING GUIDELINES
Flammable and Combustible Liquids

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background
The most common type of hazardous materials release involves flammable and combustible liquids. Flammable liquids have flashpoints at or below 140 ^{0} F. while combustible liquids have flashpoints greater than 140 ^{0} F. What is important to remember is that flammable and combustible liquids produce vapors that will burn.

Considerations:
- Vapors may form explosive mixtures with air
- Most vapors are heavier than air and will spread along ground, collect in low or confined areas (sewers, basements)
- May be easily ignited by heat, sparks, static electricity or flame
- Many liquids are lighter than water (specific gravity < 1)
- Some are known or suspected carcinogens
- Remember to spot apparatus uphill and upstream from incident

Response Objectives:

No fire
- Eliminate ignition sources
- Determine approximate amount of product involved
- Take appropriate steps to safely contain or confine spill or leak and prevent product from entering sewers and waterways
- If product enters sewer or waterway, notify appropriate agency
- Apply foam or other agents as needed to prevent ignition and minimize environmental impact
- For small spills use Bio-remediation product (Microblaze, Oil Sponge, or equivalent) and follow product directions for use

Fire
- Use correct type of firefighting foam to fight fire; ensure adequate amount is available
- Try not to disturb the foam blanket
- Prevent product from entering sewers, waterways, and confined areas
- Containers may explode in fire conditions
- Incidents at storage tanks, refineries, and pump stations may require specialized equipment and personnel; call for assistance early
- Evacuation may be appropriate to prevent exposure of the public to products of combustion

ALBUQUERQUE FIRE DEPARTMENT
STANDARD OPERATING GUIDELINES
Flammable Solids

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background
Class 4 materials are very different from each other and present a variety of hazards to responders. Materials in this class include spontaneously combustible materials and water reactives. Incidents involving this class may require special extinguishing agents and outside assistance.

Class 4 Divisions:
- 4.1 Flammable solids
- 4.2 Spontaneously combustible materials
- 4.3 Water reactive substances

Considerations:
- May ignite or produce flammable gas on contact with water or moist air
- Some react vigorously or explosively on contact with water
- Some are transported in highly flammable liquids for stability
- May be ignited by heat, sparks, or flame
- Fires produce irritating, corrosive, and / or toxic gases
- Water reactives may also be placarded as oxidizer, corrosive, flammable gas
- Fires involving these materials may require special extinguishing agents

Note: As a general rule, the use of water or foam on water reactive materials should be avoided. However, just because a material is water reactive does not *automatically* rule out the use of water; it may be necessary to use water to prevent the incident from escalating into something much more hazardous.

Response Objectives:

No fire
- Damaged containers may allow contents to mix with air or moisture or cause leaking of liquids designed to stabilize materials during transport
- Take steps to keep product dry if it is water reactive
- Keep product covered with dry sand, dirt, or other appropriate material if spill involves spontaneously combustible materials
- Eliminate ignition sources

Fire
- Use ERG to help determine isolation distances and protective actions
- Flammable solid fires can release extremely toxic gases and vapors
- Extinguishment may not be the primary focus during large flammable solid fires; available resources may be more effectively utilized evacuating the area, isolating the product, and letting it burn
- If needed, request assistance and outside expertise early

ALBUQUERQUE FIRE DEPARTMENT
STANDARD OPERATING GUIDELINES
Oxidizers and Organic Peroxides

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background
Incidents involving oxidizers and organic peroxides should be approached in a similar manner as incidents involving Class 1 Explosive materials. Explosions are possible when an oxidizer is mixed with fuel and exposed to heat, friction, shock, or pressure. The hazards of organic peroxides are related to their ability to readily decompose. Due to their molecular structure, organic peroxides are oxygen releasing agents which make them strong and unstable oxidizers that create exothermic (heat producing) reactions.

Class 5 Divisions: 5.1 Oxidizing substances
5.2 Organic peroxides

Considerations:
- Oxidizers may ignite other materials on contact
- Inorganic peroxides will decompose readily and yield oxygen in a fire or in contact with moisture
- Primary hazards of oxidizers are spontaneous ignition, intensified combustion, explosion, and the production of toxic fumes
- Liquid oxygen (LOX) can form a shock sensitive explosive on contact with hydrocarbons (asphalt, oil, fuels)
- Most pool chemicals are oxidizers or react with oxidizers

Response Objectives:

No fire
- Use ERG to determine initial isolation distances and protective actions
- Prevent combustibles from contacting material
- Do not touch or walk through product
- Conduct a thorough hazard assessment of scene

Fire
- Although water reactivity is a concern, in the majority of cases, water is the extinguishing agent of choice
- Most oxidizers are water-soluble; materials will dissolve and go where the water goes so runoff containment measures are required
- Always use SCBA due to toxic vapor production from material

ALBUQUERQUE FIRE DEPARTMENT
STANDARD OPERATING GUIDELINES
Poisions

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background
Poisonous materials are materials that are known or presumed to be highly toxic to man. Most poisonous materials are agricultural chemicals, but also include plastics, fertilizers, and even rocket fuels. An infectious substance is a viable microorganism or its toxin that causes or may cause disease. Poisons can be shipped in a variety of containers; from paper bags to rail cars.

Class 6 Divisions: 6.1 Toxic substances
6.2 Infectious substances

Considerations:

- Poisons are shipped as solids, liquids, and gases
- Infectious substances are shipped in small metal screw-top tubes inside a cardboard container and in small glass jars or vials placed inside cardboard or wooden boxes
- Smoke and vapors from fire can be *extremely* toxic
- Poison containers exposed to heat can pressurize and explode
- Many agricultural chemicals are capable of being absorbed through skin and can cause reactions similar to nerve agent exposure
- Chemical protective clothing is required for incidents involving poisonous materials; firefighting turnouts are not designed for chemical protection
- Decontamination will be required for exposed personnel
- Fires involving poisons materials are best handled by protecting exposures and letting them burn. High temperatures can break poisons down into less toxic compounds
- Contaminated runoff may be the most serious outcome of a fire involving poisons; clean-up costs could run into the millions
- In the event of a fire involving infectious substances, consider letting it burn; high temperatures will kill the organism or decompose the toxin.

Response Objectives:

No fire
- Isolate area and identify materials as soon as possible; use ERG to determine initial isolation distances and protective actions
- Conduct a thorough hazard assessment to identify the problem
- If spill or leak involves infectious substances, make immediate notification to appropriate agencies and secure area

Fire
- Consider defensive strategy: protect exposures and let it burn
- Avoid producing massive amounts of contaminated runoff

ALBUQUERQUE FIRE DEPARTMENT
STANDARD OPERATING GUIDELINES
Radioactives

SOG 5-6-08

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background
Radioactive material is any material, or combination of materials, that spontaneously emits ionizing radiation energy. Radioactive materials may be found as solids, liquids, and gases, are commonly used in smoke detectors, ground imaging equipment, medical facilities, and are found in nature. Contamination occurs when radioactive vapors, liquids, and solid particles are released into the environment. With the increased threat of terrorism, radioactive materials have been given renewed emphasis. 3 types of radioactive labels:

Radioactive White I - Almost no radiation; 0.5 mR/hr max on surface of package

Radioactive Yellow II - Low radiation levels; 50 mR/hr on surface of package; 1 mR/hr at 1 meter away (3.3 feet)

Radioactive Yellow III - Higher radiation levels; 200 mR/hr max on surface of package; 10 mR/hr at 1 meter away (3.3 feet)

Note: The average annual radiation dose received in the U.S. is 187 mR per person.

Considerations:
- Releases from packages are very unlikely in an accident
- Radioactive materials can be easily detected and measured with instrumentation carried on Hazmat Squads
- 5000 mR (5000 mR = 5 R) is the per incident and annual routine dose OSHA guideline for responders, with a one time maximum dose equivalent limit to 25 R for emergency workers (25 R = 25,000 mR)
- 3 ways to minimize radiation exposure: time, distance, and shielding

Response Objectives:

No fire
- Isolate area, use ERG to determine initial isolation distance
- Conduct monitoring operations to determine hazards
- Request additional assistance from radiological specialists if needed

Fire
- Evacuate appropriate distance and establish control zones
- Extinguish fire if there is minimal risk to responders
- Contain contaminated runoff
- Decontaminate personnel and equipment exposed
- Request additional assistance from radiological specialists
- Monitor personnel and equipment for contamination

ALBUQUERQUE FIRE DEPARTMENT
STANDARD OPERATING GUIDELINES
Corrosives

SOG 5-6-09

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background

Corrosives are materials that are capable of destroying human tissue and metal. They present various types of hazards: skin and tissue damage from direct contact with the material, respiratory damage from the inhalation of vapors, reactivity hazards when they combine with other materials, and overall instability and toxicity of certain types of corrosives. There are 2 general categories of corrosives: acids and bases. On the 0-14 pH scale (with 7 being neutral), solutions with a pH of 0-6 are acids; solutions with a pH of 8-14 are bases. *Strength* refers to the percentage of ionization that occurs when a material is mixed with water. *Concentration* is the ratio of the material to water expressed in percent of weight or volume.

Considerations:

- Most corrosives are water soluble; water streams may be able to knock down, control, or disperse corrosive vapor clouds
- Some react violently with water, releasing corrosive and / or toxic gases
- Some can ignite flammable and combustible materials on contact
- Some are strong oxidizers
- Contact with metals may produce flammable hydrogen gas
- Some can become shock sensitive explosives (crystallized picric acid) while others can polymerize if exposed to heat and sudden shock (acrylic acid)
- Firefighting turnouts offer very limited protection; offensive operations usually require chemical protective clothing and decontamination

Response Objectives:

No fire

- Use ERG to determine initial isolation distances and protective actions
- Contain to prevent contamination with other materials, to prevent material from entering sewers and waterways, and to reduce environmental damage
- Avoid getting water inside containers
- Control leak if properly trained and equipped personnel available
- Transfer of product will require assistance from outside agencies
- Control measures that may involve contact with material require appropriate level of chemical protective clothing and decontamination

Fire

- Initiate appropriate public protective actions; fires produce highly toxic and corrosive smoke
- Avoid applying water directly to spill; protect exposures
- Depending on type of container and exposures, may require defensive strategy: containment, exposure protection, letting material burn

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background

Miscellaneous hazardous materials are materials that present a hazard during transportation, but are not included in any other hazard class. Examples of these materials are magnetized materials, asbestos, quick lime, hazardous waste, and consumer commodities. Consumer commodities are hazardous materials that are packaged in a form intended or suitable for retail sales like aerosol spray paints, batteries, and medical and cleaning supplies.

Considerations:

- Identification of materials is a priority
- Fires involving shipments of consumer commodities may be a mixed bag of hazards - could involve incompatible chemicals mixing together, projectile hazards from heated aerosol cans, flammables, corrosives, plastics, etc.
- Conduct thorough hazard assessment and develop strategy accordingly

Response Objectives:

- Use ERG to determine initial isolation distances and protective actions
- Follow AFD standard operating guidelines for hazmat incidents using hazmat tactical acronym S.I.N.C.I.A.P.C.P.D.D.D.

ALBUQUERQUE FIRE DEPARTMENT
STANDARD OPERATING GUIDELINES
Cryogenics

SOG 5-6-11

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background
Although definitions vary, a cryogenic material is any material that has a boiling point below -150^0 F. There are 3 general characteristics of cryogenic materials: they have extremely low boiling points, all boil at ambient temperatures, and all have extremely large liquid-to-vapor expansion ratios. Cryogenics are divided into 3 basic groups: 1) flammables (liquefied methane or LNG), oxidizers (liquefied oxygen or LOX), and non-flammables (nitrogen, argon, and other inert or "noble gases").

Considerations:
- All cryogenic gases are colorless and invisible
- All are extremely cold and can cause freezing of tissue
- All (except oxygen) displace breathable air; responders could be asphyxiated before they recognize the problem
- Do not apply water to vent area of containers; it could freeze vent open or closed, leading to over-pressurization
- If cryogenic container is damaged externally and inner skin is exposed, application of water will heat product which will initiate or increase boiling
- Cryogenics will cause metal objects to become brittle
- LOX can cause certain organic materials to spontaneously ignite; when mixed with petroleum products, will produce a contact explosive
- Liquid hydrogen burns with an invisible flame and is readily ignited by heat, friction, static or electrical sparks
- Cryogenics will remain close to the ground and flow into low lying areas
- Cryogenic containers can BLEVE

Response Objectives:

No Fire
- Isolate area, use ERG to determine initial isolation distances and protective actions
- Stay upwind and out of low lying areas
- Prevent product contamination with other materials
- Control ignition sources
- Do not walk through vapor cloud or product pool
- Damaged containers should be handled by specialists
- Remember: vapor cloud only represents *visible* product

Fire
- Evacuate area
- Protect exposures and cool tank if possible (use caution: if inner skin is exposed, water will heat product and initiate or increase boiling)
- Remember: cryogenic containers can BLEVE

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background

Natural gas is a colorless, odorless, non-toxic flammable gas. Natural gas is a mixture of light hydrocarbons but is almost entirely composed of methane (typically 90%). For safety reasons, a chemical odorant (Mercaptan) is added to make it possible to smell leaks. Natural gas is lighter than air and has a narrow flammable range of 4% - 15% in air. Although natural gas is non-toxic, it can displace oxygen in a confined area and create an asphyxiation hazard. Underground leaks may permit natural gas to migrate considerable distances before entering a structure through void spaces and has been the cause of explosions in structures which were not even served by natural gas. Combustible gas instrumentation is the most reliable way to detect the presence of natural gas and make decisions regarding its flammable range at an incident. It is important to recognize that responses to “odor of gas” “gas leak” and “broken gas line” incidents range from relatively minor incidents to major events.

Response Objectives

Fire departments encounter natural gas in a variety of situations. It is not practical to develop individual guidelines for each possible situation involving natural gas. The following response objectives are broad-based and will be applicable for most natural gas emergencies, but are not designed to replace the knowledge, experience, and common sense of the firefighters who respond.

<u>Leaks With No Fire:</u>

- Isolate the affected area
- Take appropriate public protective actions
- Control ignition sources
- Remember that explosive concentrations of natural gas can accumulate inside structures
- For indoor leaks, hazmat personnel should conduct atmospheric monitoring to determine flammable range of environment prior to entering; vent if necessary
- Secure leak if it can be done safely - do not use makeshift devices or equipment not specifically designed for natural gas leaks as clamps or plugs
- Ventilate area after leak is secured
- PNM required for incidents involving Red Tag of leaking appliances

- Full turnouts and SCBA are required PPE

- Outdoor standbys for PNM leak control activities require charged hoseline and RIT

Leaks With Fire:

- Isolate affected area

- Take appropriate public protective actions

- Protect exposures

- Control fire by stopping flow of gas feeding leak

Note: Always request PNM Gas representatives to emergencies involving natural gas.

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background

Clandestine drug labs are makeshift laboratories used for the primary purpose of illegally manufacturing controlled substances, such as cocaine, MDMA (Ecstasy), Phencyclidine (PCP), LSD, and Methamphetamine (most frequently encountered). These labs are typically small and can be found just about anywhere. Many hazards are present at these labs due to the variety of common household chemicals used in the manufacturing process and the presence of booby-traps that can cause potentially lethal injuries.

Considerations

- Typical chemical hazards at clandestine drug labs include solids, liquids, and gases that are flammable, corrosive, toxic, and water reactive

- Solvents are the most common type of chemical found; many are absorbed by the skin and are known carcinogens, and are the major cause of fires and explosions at labs

- Do not touch or move anything until area is determined safe by the law enforcement agency in charge (opening or moving doors, windows, refrigerator doors, chemical containers, or furniture may be a triggering mechanism for an explosive device or other booby-trap)

- Common indicators of clandestine drug labs:
    - Large amount of blister packs of cold medication
    - Unusual amounts of house cleaning products
    - Bottles or jars with rubber or plastic tubing attached
    - Large amounts of Coleman Fuel, acetone, Red Devil Lye, and HEET
    - Jars of multi-layered liquids
    - Jars labeled Red Phosphorus, Sulfuric acid, or Hydrochloric acid
    - Unusual chemical odors

- The Albuquerque Fire Department will provide limited support for law enforcement agencies when requested for clandestine drug lab operations; support may consist of but is not limited to the following:
        - EMS
        - Emergency decontamination
        - Ventilation
        - Air monitoring
        - Refilling SCBAs
        - Technical research

- Be aware that response to suspicious odor complaints, explosions, structure and vehicle fires, EMS calls involving headaches, nausea, and sick calls, could directly or indirectly involve clandestine drug lab operations

- Clandestine drug labs are crime scenes

Response Objectives
Fire departments may encounter clandestine drug labs in a variety of situations. It is not practical to develop individual guidelines for every possible circumstance. However, it is possible to list 3 general situations in which responders are likely to encounter these labs. These response objectives are broad-based and are not designed to replace the knowledge, experience, or common sense of the firefighters who respond.

Situation 1: Assisting law enforcement at clandestine drug labs

- Hazmat Squad officer will liaison with law enforcement incident commander and obtain briefing regarding the type of assistance required; AFD will provide limited support consistent with activities identified in the previous section of this guideline

- When standing by for P.D. in SWAT situations involving known or suspected unsecured clandestine drug labs, AFD personnel are to stay out of the hazard zone and remain in a safe area until scene is secured

- AFD may provide assistance to law enforcement personnel engaged in lab processing operations at a secured lab site; these operations typically involve identification, removal, documentation, and securing hazardous chemicals found at the scene

Situation 2: Response to fires involving known or suspected clandestine drug labs

- A Defensive strategy is the preferred firefighting approach unless a situation involving a viable life-saving rescue exists

- Because of the various physical and chemical hazards at clandestine drug labs, if the incident does not involve a viable life-saving rescue - isolate the area, focus on protecting exposures, and let it burn

- Do not secure utilities unless it can be determined that no active cooking processes are occurring that could increase the risk to responders

- If fire occurs in a motel, hotel, apartment, or other multi-story structure, focus on confinement and containment of fire area involved and evacuate the surrounding floors or units

- All exposed personnel should be decontaminated at scene

- Request P.D.; avoid extensive salvage and overhaul in order to preserve evidence

Situation 3: Encountering clandestine drug labs unexpectedly

- Do not touch anything and withdraw as soon as practical – safety of responders and the public is the primary consideration

    - If recognition occurs during an EMS incident, use discretion and try to conduct the assessment and treatment of patients away from the immediate environment (outside or in the back of a Rescue or AAS unit)

- Advise AFD Dispatch of the situation and request P.D.

    - Use discretion when requesting law enforcement to these incidents; people under the influence of methamphetamine are capable of violent, erratic behavior

- If recognition of the lab occurs during offensive firefighting operations, crews should withdraw from the immediate area and advise Command who will adjust incident action plan accordingly (see *Situation 2*: *Response to fires involving known or suspected clandestine drug labs*)

Health and Safety

Personnel showing signs and symptoms of chemical exposure during or after incidents involving known or suspected clandestine drug labs should be evaluated as soon as possible. Exposed personnel will be required to complete the appropriate exposure control forms.

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background

In the anthrax attacks of 2001, *B anthracis* spores were sent in at least five letters to Florida, New York City, and Washington, D.C. Twenty-two confirmed or suspected cases resulted. Eleven of these were inhalation cases that resulted in five deaths. Eleven were cutaneous cases (seven confirmed; four suspected). Before the anthrax attacks in 2001, modern experience with inhalation anthrax was limited to an epidemic in Sverdlovsk, Russia, in 1979, following an unintentional release of *B anthracis* spores from a Soviet bioweapons factory, and to eighteen occupational exposure cases in the United States during the 20th century. Information about the potential impact of a large, covert attack using *B anthracis* or the possible efficacy of postattack vaccination or therapeutic measures remains limited.

Prior to the anthrax attacks of 2001, there had been no recognition or scientific study showing that *B anthracis* spores of "weapons grade" quality would be capable of leaking out of the edges of envelopes or through pores of envelopes, with resulting risk to the health of those handling or processing those letters. Much remains unknown about the risks to persons handling or processing unopened letters containing *B anthracis* spores; it is still uncertain what the minimum dose of spores would be to cause infection in humans although it may theoretically be as few as 1 to 3 spores. The mechanisms of disease acquisition in the two fatal inhalation anthrax cases in New York City and in Connecticut remain unknown although it is speculated that disease in these two cases followed the inhalation of small numbers of spores present in some manner in cross-contaminated mail. (Source: ***JAMA – Anthrax as a Biological Weapon, 2002: Recommendations for Management.***)

Suspicious Letters / Package Facts:

What are some common indicators of a suspicious letter or package?

- Presence of powdery substance on the outside
- Mailed from a foreign country
- Excessive postage
- Handwritten or poorly typed address
- No return address or one that cannot be verified
- Restrictive markings such as "personal" or "confidential"
- Strange odors, oily stains or discoloration on surface
- Packages received at different locations, in the same community, at the same time, with similar appearance

What constitutes a Credible Threat?

A Credible Threat consists of a letter or package having either of the following:

a) A letter or a package with an explicit threat with or without material present
Or
b) A letter or package that is suspicious for a bomb or other hazardous material, e.g., ticking, protruding wires or foil, unexplained material leaking from the package

A large number of potentially suspicious packages continue to be reported to federal, state, and local law enforcement and emergency response agencies nationwide. While these guidelines focus on initial response to suspicious letters or packages posing potential biological threats, responders should be aware that suspicious letters and packages may also involve exposure to chemical, radiological, and explosive materials.

Considerations

- An explicit threat with or without the presence of a suspicious substance is a federal crime and requires the notification of the FBI

- FBI regulations require that prior to taking custody of a suspicious letter or package, local Hazmat personnel must wear appropriate PPE and conduct a field safety screen prior to moving, packaging, and handing over a suspicious letter or package for transportation to a lab

- If the suspicious letter or package involves an unopened container (a box, bulky letter, or parcel) FBI regulations require that the suspicious letter or package be evaluated by certified bomb technicians prior to being handled by Hazmat personnel (call APD Bomb Squad for assistance)

    - The field safety screen consists of assessing the suspicious letter or package for the presence of radioactivity, corrosives (pH), Volatile Organic Compounds (VOC), flammables, and explosives

- Even though AFD has the training, resources, and capabilities to detect the possible presence of various chemical and (some) biological hazards, definitive analysis can only be conducted by an appropriate lab; currently there are no definitive field tests for identifying biological agents

- Notify the U.S. Postal Inspection Service whenever it appears that the threat was delivered through the U.S. Postal Service

- Remember: the incident you respond to may be the first of a series of related events that may involve a true chemical or biological act of terrorism; always take appropriate precautions and provide for public and firefighter safety

Response Objectives

Responders may encounter a variety of situations involving suspicious letters or packages. Experience has shown, however, that there are a few general situations responders will most likely encounter. The following response objectives have been developed for these situations. They are broad-based, and will be applicable to most suspicious letter and package incidents, but are not designed to replace the knowledge, experience, or common sense of the firefighters who respond.

Situation 1: Response to suspicious letter or package with unknown powder and an articulated (explicit) threat

- Ensure that Dispatch has advised the calling party:
    - Not to handle the letter or package
    - Isolate and deny entry to the immediate area of package
    - Advise anyone who handled the package to wash their hands with soap and water
    - Shut down air handling systems that service the area involved
    - Have a representative meet arriving units outside

- Make contact with a representative away from the area involved and ensure that pre-arrival instructions have been carried out

- Gather as much information about the situation as possible to verify that criteria for a *Credible Threat* has been met (if so notify the FBI) and obtain the names and contact information of anyone who may have handled or have been exposed

- A Hazmat Recon Team, consisting of 2 Hazmat Technicians, will begin a hazard assessment and conduct a preliminary reconnaissance of the area involved

- Hazmat Recon Team's basic mission:

    - Wear Level B PPE (Tyvek coveralls acceptable) and SCBA

- Conduct field safety screen without moving or disturbing letter or package
- Utilize digital photography (if available)

- FBI regulations require Hazmat personnel in PPE to conduct field safety screen, double-bag evidence, and decontaminate outside of bag prior to handing it over to FBI for transportation and lab analysis

- Immediate area where suspicious letter or package was held should remain isolated pending the result of the laboratory analysis

Situation 2: Response to suspicious letter or package with unknown powder (no articulated (explicit) threat)

- Ensure that Dispatch has advised the calling party:
  - Not to handle the letter or package
  - Isolate and deny entry to the immediate area of package
  - Advise anyone who handled the package to wash their hands with soap and water
  - Shut down air handling systems that service the area involved
  - Have a representative meet arriving units outside

- Make contact with a representative away from the area involved and ensure that pre-arrival instructions have been carried out

- Gather as much information as possible; determine if there are any other common indicators of suspicious letters or packages present

- A Hazmat Recon Team, consisting of 2 Hazmat Technicians, will begin a hazard assessment and conduct a preliminary reconnaissance of the area involved to verify the presence of the unknown powder

- Hazmat Recon Team's basic mission:

  - Wear Level B PPE (Tyvek coveralls acceptable) and SCBA
  - Conduct field safety screen without moving or disturbing letter or package
  - Utilize digital photography (if available)

- If there is evidence of a substance, then attempt to determine if there is a reasonable explanation for it; if there is - no further action may be necessary

- If there is any question as to whether the situation meets the Credible Threat criteria, contact the FBI and advise them of the situation

- If Hazmat Recon Team has consulted with the FBI, there were negative findings by the field screen, no visible substance or powder is present, there is no articulated threat, and there are no other common indicators of suspicious letters or packages present, then no further action may be necessary

- At this point, responders may concentrate on customer service related issues

Situation 3: Response to a suspicious letter or package with an articulated threat but no substance or powder

- Ensure that Dispatch has advised the calling party:
    - Not to handle the letter or package
    - Isolate and deny entry to the immediate area of package
    - Advise anyone who handled the package to wash their hands with soap and water as a precaution
    - Have a representative meet arriving units outside

- Make contact with a representative away from the area involved and ensure that pre-arrival instructions have been carried out

- Gather as much information as possible; determine if there are any other common indicators of suspicious letters or packages present

- An articulate threat- with or without the presence of a suspicious substance- is a federal crime and requires notification of the FBI

- At this point, the situation is highly dependent on incident particulars; if the item involved has no other common indicators of suspicious letters and packages, then consult with law enforcement and assist in the investigation

- If it is determined that a Hazmat Recon Team is required to conduct field safety screen and collect evidence, then follow the guidelines outlined in *Situation 1: Response to suspicious letter or package with unknown powder and an articulated threat*

Note: Exercise discretion with radio communications; unnecessary media attention to these types of events frequently results in an increased number of responses to suspicious letter / package incidents.

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background
Abandoned waste oil incidents have become common in recent years. Abandoned 55 gallon drums of waste oil are no longer confined to secluded areas outside the City limits; they are now routinely found behind shopping malls, in industrial parks, and in residential areas. Unfortunately, property owners typically get stuck paying for the disposal of the hazardous waste even though they were not responsible for generating it. The City Environmental Health Department and the AFD have worked closely together to develop guidelines for responding to these incidents.

Considerations

- Abandoned waste oil incidents require clean-up and disposal by an outside agency

- These incidents may or may not pose an immediate threat to the public or the environment

- Abandoned waste oil incidents sometimes require the identification of property lines in order to determine a responsible party; contact the Fire Prevention Bureau or City Environmental Health Department (EHD) for assistance

- If it is safe to do so, reposition leaking drums if doing so will temporarily stop the leak

- The goal of hazardous materials response is the protection of life, property, and the environment

Response Objectives
It is not practical to develop guidelines for every possible situation involving abandoned waste oil. There are, however, some general situations of this type that responders frequently encounter. The following response objectives are broad-based, and will be applicable for most incidents involving abandoned waste oil but are not designed to replace the knowledge, experience, and common sense of the firefighters who respond.

Situation 1: Response to abandoned waste oil on public property / City streets

<u>During business hours:</u>

- Stabilize the scene, isolate and mark the area, and advise Battalion 1 Commander of the situation
- Battalion 1 Commander will make notification to Environmental Compliance Coordinator with the City Environmental Heath Department (EHD)

- Based on incident needs, EHD may respond directly or decide to call out an environmental clean-up company under contract with the City to the scene

- In most cases, units may clear the scene unless the situation poses an immediate threat to public safety or the environment

After hours:

- If containers pose no immediate threat to public safety or the environment, stabilize the scene, isolate and mark the area, and advise Battalion 1 Commander of the situation

- Battalion 1 Commander will make notification to the EHD Compliance Coordinator in order to resolve the situation the next business day

- In most cases, units may clear the scene unless the situation poses and immediate threat to public safety or the environment; in such cases, Battalion 1 Commander has been authorized to request an emergency clean-up company under contract with the City to respond

Situation 2: Response to abandoned waste oil on private property

During business hours:

- Stabilize the scene, isolate and mark area, and notify property owner of their responsibility to arrange for clean-up

- If no property owner is available, or if you experience any problems regarding responsibility, consider consulting with or requesting a Fire Prevention Inspector or EHD representative for assistance; advise Battalion 1 Commander of the situation

- Notify the Fire Prevention Bureau and make a referral if necessary

After hours:

- If situation poses an immediate threat to public safety or the environment, stabilize the scene, isolate and mark area, and notify property owner of their responsibility to arrange for clean-up; notify Battalion 1 Commander

- If you experience any problems regarding responsibility or if no property owner is available, consider consulting with or requesting an on-call Fire Prevention Inspector for assistance; advise Battalion 1 of the situation

- Situations involving private property can get complicated; the Fire Prevention Bureau and the Nuisance Abatement Team have done a lot of work in this area – consider requesting a representative to the scene for assistance
- Battalion 1 Commander will make a courtesy notification to the City EHD

Situation 3: Response to abandoned waste oil on the Interstate / State Highways

- Incidents occurring at these locations require notification of the NM State Police; a representative may or may not respond depending on the situation

- If containers pose an immediate threat to public safety and the environment, request a NM State Police representative to the scene

- If containers do not pose any immediate threat to public safety or the environment, notify NM State Police and advise them of the situation; notify Battalion 1 Commander

- Battalion 1 Commander will make a courtesy notification to the City EHD

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background
Often referred to as *The Silent Killer* carbon monoxide (CO) is a colorless, odorless, extremely poisonous and explosive gas that causes 1,500 accidental deaths and more than 10,000 injuries each year. It is slightly lighter than air and can spread rapidly throughout a structure. CO is a by-product of incomplete combustion, produced when fuels such as natural gas, propane, heating oil, kerosene, coal, charcoal, gasoline, or wood, are burned.

Health Effects
When someone breathes in carbon monoxide, it is absorbed by hemoglobin, the oxygen-carrying protein in the blood. Carboxy hemoglobin is then formed, replacing oxygen and preventing its release in the body. There are a variety of symptoms associated with CO poisoning. Mild exposures could result in flu-like symptoms, including headache and nausea. Medium exposures could result in severe headache, drowsiness, and confusion. Extreme exposures could result in loss of consciousness, convulsions, heart and respiratory failure, and death. The unborn, infants, young children, seniors, and those with heart or lung problems are at a higher risk for injuries from CO poisoning.

The IDLH of CO is 1200 ppm (Immediately Dangerous to Life and Health). The OSHA PEL is 50 ppm (Permissible Exposure Limit = 40 hours per week, 8 hours per day exposure without adverse health effects) while the EPA PEL is 35 ppm.

Considerations

- CO has a wide flammable range (12.5% - 75% in air)

- CO is a colorless, odorless, toxic flammable gas - you cannot properly investigate, detect, or measure CO without a CO monitor

- Possible sources of CO include: gas and wood burning stoves, hot water heaters, fireplaces, gas and oil furnaces, gas, oil, and kerosene space heaters, blocked flues or flues in poor condition, vehicles running in garages or basements, and improperly vented areas near fuel burning appliances

- Downdrafts can also be responsible for elevated levels of CO in structures

- Below grade areas (cellars and basements) may contain dangerous levels of CO; responders are required to use SCBA during investigation

- Expand search area for multi-family dwellings when conducting CO investigations

- Always assume CO was the cause of an alarm, not a faulty detector; investigate thoroughly with a CO monitor

- Be aware that there may be more than one source responsible

- Request PNM gas for assistance

Response Objectives

The following response objectives are broad-based and will be applicable in the majority of incidents involving carbon monoxide emergencies but are not designed to replace the knowledge, experience, or common sense of the firefighters who respond.

- On arrival, interview occupants and get a history of what has been occurring (appliances being used, fireplace or water heater recently repaired, flu-like symptoms for days, etc.)

- Conduct atmospheric monitoring with a calibrated CO monitor; if practical, have occupants wait outside during investigation

- Even after finding an apparent source of the problem, continue to investigate; there may be more than one source responsible for elevated levels of CO

- Expand search area for multi-family dwellings when conducting CO investigations

- Wear appropriate PPE required for investigating below grade areas that may contain dangerous levels of CO (turnouts and SCBA)

- PNM is required to “Red Tag” faulty appliances found to be sources of CO

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background
Liquified petroleum gases (LPG) are flammable gases that are compressed to liquid to allow transport of greater quantities. Containers range in size from one-gallon cylinders to 30,000 gallon rail tank cars. Propane and Butane (or a combination of the two) are the most common types of LPG. Liquified petroleum vapors are heavier than air and are capable of flashing back to the leak if the vapors find an ignition source. Most pressurized containers have a pressure relief valve designed to relieve the container of excess pressure and then reseat, but if the heat of the container is too great or flame impingement on the tank is too intense, the pressure relief valve may not be able to relieve the pressure adequately and the container may violently rupture.

BLEVE hazard
The most significant hazard associated with LPG emergencies is a BLEVE. The phenomenon known as a BLEVE (Boiling Liquid Expanding Vapor Explosion) is the result of a liquid within a container reaching a temperature well above its boiling point at atmospheric temperature, causing the pressure within the vessel to continue to increase until the vessel eventually ruptures violently into two or more pieces. The most common BLEVEs occur as a result of direct flame impingement on a container, but a few BLEVEs have occurred due to container failures from other causes, such as corrosion or impact from an outside force. Impact failures are noticeable in transportation accidents involving rail cars or cargo tank vehicles. In these cases, the BLEVE generally has occurred simultaneously with impact, but in one instance, a 30,000 tank car of LPG was only severely weakened by impact during derailment, and did not BLEVE until more than 40 hours later. When a BLEVE occurs, debris may travel hundreds of feet and escaping fuel can ignite causing an expanding fireball. Sections of tank shell have been known to travel up to a mile away from the site of a BLEVE.

Considerations

- Contact with liquid may present frostbite hazard

- The most common cause of LPG BLEVEs is thermal stress from direct flame impingement (primarily on the vapor space above the liquid line of container)

- When flames are impinging on an LP tank, there is no safe side or end to approach; BLEVEs have sent tank sections flying in *all* directions

- TIME is the most important factor to consider when confronted by an LPG container with flame impingement (in the case of the Albert City incident, a BLEVE occurred within 8 minutes of the arrival time of fire department units)
- Do not assume a BLEVE will not occur because the relief valve is operating

- A high pitch shrieking noise from an operating pressure relief valve indicates that a BLEVE is imminent and should signal an immediate withdrawal of personnel

- The most effective way to reduce the potential of a BLEVE is to apply large quantities of water to the tank to cool the vessel with unmanned monitors or unattended hoselines until well after fire is out

    - A general rule of thumb for a large LPG tank with flame impingement is that if a minimum flow of 500 gpm cannot be maintained - do not risk exposing personnel

- For leaks with no fire, the flow of gas should be slowed or stopped by using intact valves or control devices

- For massive fires, use unmanned monitors; if this is not possible, evacuate and withdraw immediately – BLEVE is imminent

Response Objectives

The following response objectives are broad-based, and will be applicable for most incidents involving LPG emergencies but are not designed to replace the knowledge, experience, and common sense of the firefighters who respond.

<u>Leaks With No Fire:</u>

- Isolate area

- Take appropriate public protective actions

- Control ignition sources

- Attempt to stop or control leak if safe to do so

- Water fog can be used to knock down flammable vapors

- Full turnouts and SCBA required

- Request assistance if needed; local LPG experts available

Leaks With Fire:

- Isolate area

- Take appropriate public protective actions

- For LPG with direct flame impingement - TIME is critical factor (do not assume a BLEVE will not occur simply because the relief valve is operating)

    - A general rule of thumb for a large LPG tank with flame impingement is that if a minimum flow of 500 gpm cannot be maintained, do not risk exposing personnel

- If there is adequate time, apply and maintain sufficient large flooding quantities of water on tank surface to cool tank using unmanned monitors or unattended hoselines

    - Remember: a high pitch shrieking noise from an operating pressure relief valve indicates that a BLEVE is imminent and should signal an immediate withdrawal of personnel

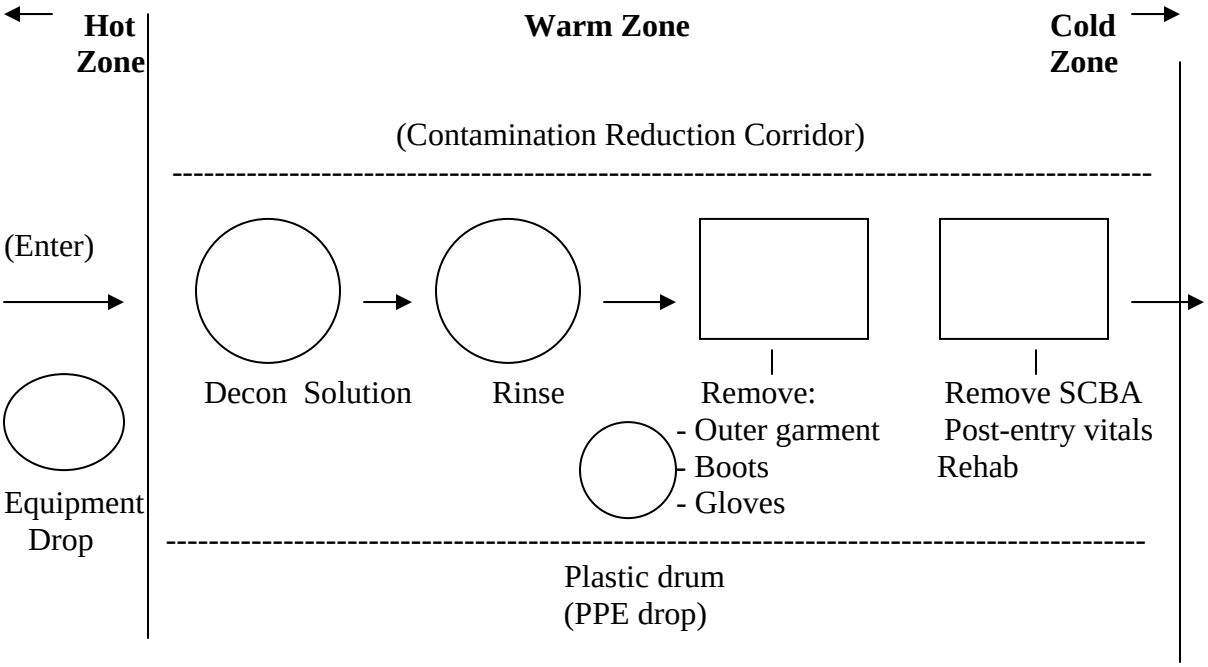
- For massive fires use unmanned monitors to apply and maintain large flooding quantities of water on tank surface; this will be time consuming. If command determines that this action is not feasible, evacuate the area, withdraw and let fire burn; BLEVE is imminent

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Background
The goal of decontamination is to prevent the spread of contamination by removing hazardous materials from people and equipment. Depending on the particular material involved, decontamination may be either wet or dry. The use of decontamination solutions may be appropriate for some situations, but soap and water will work for just about any situation requiring wet decon. In other cases, brushing or wiping off suspected contamination (dry decon) would be more appropriate.

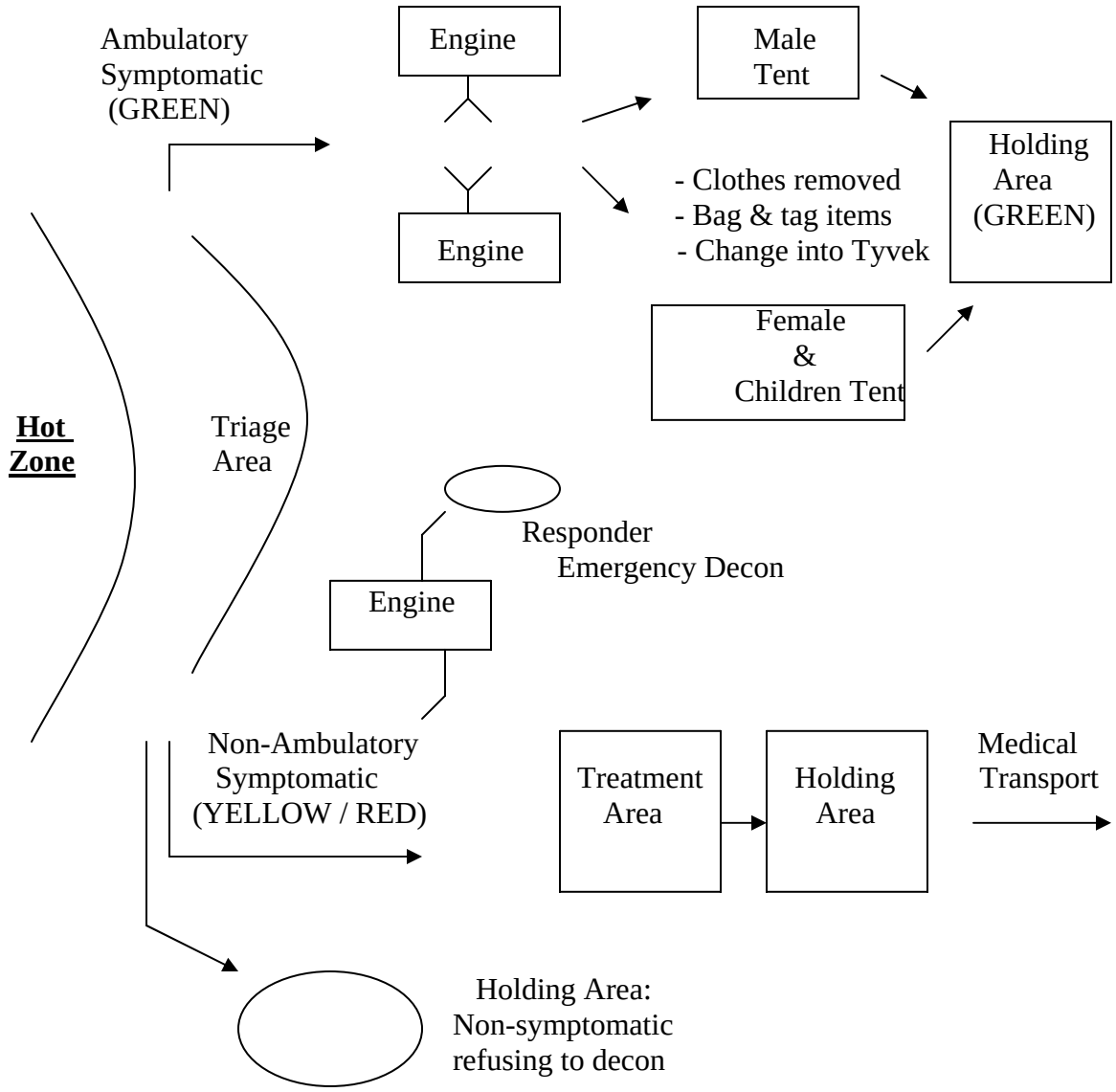
Primary and Mass Decontamination
The decontamination area should provide a corridor leading away from the source of contamination toward an exit, with stations along the way for the deposit of tools, equipment, protective clothing, and other items.

Primary Decon layout



Note: There are many decontamination layouts; the above example is a simple 2 stage wash / rinse layout.

Mass Decon Layout



Note: Drawing is not to scale; each functional area identified should be separated enough to prevent cross-contamination. Concerns over run-off are secondary to life saving measures in mass decon situations, but the layout must account for where run-off will go. The above illustration represents a layout that has been designed to do the most good, for the most people, in the least amount of time, and has proven to be effective in previous mass decon drills.

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Emergency Decon
Emergency decon can be as simple as using a hoseline from an engine company to wash down potentially contaminated people until a formal layout can be established. The goal is to remove contamination quickly to limit the effects of exposure.

Response Objectives
The following response objectives are broad-based, and will be applicable for most incidents requiring decontamination but are not designed to replace the knowledge, experience, and common sense of the firefighters who respond.

Primary decontamination:

- Ensure that decon area is uphill and upwind of the Hot Zone

- Clearly mark the decon area with traffic cones, flags, salvage covers, scene tape, etc., for visibility

- Design the decon layout based on the specific materials and degree of anticipated exposure of personnel who will be working in the Hot Zone; consult with the Technical Reference Unit to know the hazards of the material involved and decontamination recommendations

- Personnel working in Decon area must be in appropriate level of PPE (The same level or 1 level below that used by the Entry Team)

- In most cases, run-off should be contained and retained for proper disposal; prevent contaminated run-off from spreading (dike if necessary)

- Remember to have enough tools, equipment, and personnel to adequately manage decon activities (chairs, trash containers, pump spray cans, trash bags, absorbent pads, etc.)

Emergency Decontamination:

- Use an engine company hoseline to wash down responders or the public suspected of being contaminated by hazardous materials

- Patients in need of medical attention should be removed from the source of contamination as quickly as possible and decontaminated prior to receiving treatment

Mass Decontamination:

- Wear appropriate PPE
- Select decon area that is uphill and upwind from the Hot Zone, and large enough to accommodate a mass decon layout
- Separate functional areas enough to prevent the spread of contamination
- Focus on maintaining firm control over functional areas; be very direct telling people what you want them to do and where you want them to go
- Advise Command of resource and equipment needs early
- While important, modesty and privacy issues in mass decon situations are secondary to life-saving measures and removing contaminants
- Remember: the goal is to do the most good, for the most people, in the least amount of time

S.T.A.R.T. Triage System

- If incident involves mass casualties S.T.A.R.T. will be utilized to triage patients according to the following categories:
    - Immediate (Red)
    - Delayed (Yellow)
    - Minor (Green)
    - Dead / Dying (Black)

Hazardous Materials Technician

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

Purpose

The purpose of this guideline is to provide the basic response strategy for the Albuquerque Fire Department to incidents involving hazardous materials at the Technician Level in order to meet the goal of protecting life, property, and the environment.

Policy

These guidelines identify the approach that Albuquerque Fire Department Hazardous Materials Technician Level responders shall take at incidents involving hazardous materials regardless of the size, type, or complexity of the incident.

I. Background: Laws, Regulations, and Standards

A. There are several corresponding laws, regulations, and standards that impact response to hazardous materials incidents

1. Laws are created by Congress or state legislatures and typically provide broad-based goals and objectives and establish penalties for non-compliance. Examples of this are the Clean Water Act (CWA) and the Superfund Amendments and Reauthorization Act (SARA).

2. Regulations are created by federal and state agencies as methods of providing guidelines for complying with laws. An example of a Federal hazmat regulation is the Hazardous Waste Operations and Emergency Response regulation known as HAZWOPER (29 CFR 1910.120). The Hazardous Materials Emergency Response Plan (HMER Plan) is an example of a state regulation.

3. Consensus standards are developed through professional organizations or trade associations and may be adopted by government agencies, corporations, and other organizations. Three of the most important consensus standards affecting hazardous materials response are:

    a. NFPA 471(Recommended Practices for Responding to Hazardous Material Incidents).

b. NFPA 472 (Standard for Professional Competence of Responders to Hazardous Materials Incidents).

c. NFPA 473 (Standard for Professional Competence of EMS Personnel Responding to Hazardous Materials Incidents)

II. Hazardous Materials Technician Level: Description

A. NFPA 472 *Professional Competence of Responders to Hazardous Materials Incidents* E.1.3 (Annex E) defines Hazardous Materials Technicians as "Those persons who respond to releases or potential releases of hazardous materials for the purpose of controlling the release. Hazardous materials technicians are expected to use specialized chemical protective clothing and specialized control equipment."

B. NFPA 472 *Professional Competence of Responders to Hazardous Materials Incidents* identifies core competencies for responders trained to the technician level. In addition to being competent at the first responder awareness and operations levels, the hazardous materials technician shall be able to perform the following tasks:

1. Analyzing a hazardous materials incident to determine the magnitude of the problem in terms of outcomes by completing the following tasks:

a. Survey the hazardous materials incident to identify special containers involved to identify or classify unknown materials, and to verify the presence and concentration of hazardous materials through the use of monitoring equipment.

b. Collect and interpret hazard and response information from printed resources, technical resources, computer data bases, and monitoring equipment.

c. Determine the extent of damage to containers.

d. Predict the likely behavior of released materials and their containers when multiple materials are involved.

e. Estimate the size of an endangered area using computer modeling, monitoring equipment, or specialists in this field.

2. Plan a response within the capabilities of available personnel, personal protective equipment, and control equipment by completing the following tasks:

   a. Identify the response objectives for hazardous materials incidents.

   b. Identify the potential action options available by response objective.

   c. Select the personnel protective equipment required for a given action option.

   d. Select the appropriate decontamination procedures.

   e. Develop a plan of action, including safety considerations consistent with the local emergency response plan and the organization's standard operating procedures, and within the capability of the available personnel, personal protective equipment, and control equipment.

3. Implement the planned response to favorably change the outcomes consistent with the organization's standard operating procedures and safety considerations by completing the following tasks:

   a. Perform the duties of an assigned hazardous materials branch position within the local incident management system (IMS).

   b. Don, work in, and doff personal protective clothing, including, but not limited to, both liquid splash and vapor-protective clothing with appropriate respiratory protection.

   c. Perform the control functions identified in the plan of action.

4. Evaluate the progress of the planned response by evaluating the effectiveness of the control functions.

5. Terminate the incident by completing the following tasks:

   a. Assist in the incident debriefing.

   b. Assist in the incident critique.

   c. Provide reports and documentation of the incident.

III. Hazmat Tactical Priorities Acronym: S.I.N.C.I.A.P.C.P.D.D.D.

A. The Hazmat Tactical Priorities acronym is essentially a "mental blueprint" for response to hazardous materials incidents, providing responders with a systematic approach to these events regardless of the size, type, or complexity of the incident.

1. Instead of becoming overwhelmed or distracted by non-critical issues, the tactical priorities acronym helps responders stay focused on the priorities of the incident and the critical tasks that need to be accomplished in order to protect life, property, and the environment.

B. **S.I.N.C.I.A.P.C.P.D.D.D.** Overview

S = SAFETY
I = ISOLATION
N = NOTIFICATIONS
C = COMMAND & MANAGEMENT
I = IDENTIFICATION & HAZARD ASSESSMENT
A = ACTION PLANNING
P = PROTECTIVE EQUIPMENT
C = CONTAINMENT & CONTROL
P = PUBLIC PROTECTIVE ACTIONS
D = DECONTAMINATION
D = DISPOSAL
D = DOCUMENTATION

C. Hazmat Tactical Acronym: Description

The following hazmat tactical acronym description is more comprehensive than the description found in the First Responder Operations Level guidelines:

1. Safety - Approach any incident involving hazardous materials from a direction that is upwind, uphill, and upstream from the incident. While enroute, attempt to obtain as much information as possible about the incident from Dispatch.

    a. Form of the material (solid, liquid, or gas).

    b. Type of container (pressure / non-pressure).

    c. Approximate amount of material involved (bulk vs non-bulk).

    d. Name or 4 digit UN identification number of the material involved.

    e. Number of injured (if any).

    f. Observations by calling party (presence of a red vapor cloud, white powder, hissing noises, etc.).

    g. Other information that may be helpful regarding any known or suspected cause of the incident (forklift puncturing a drum, overturned tanker, etc.).

    h. Information regarding wind direction and weather conditions are of limited value and may not reflect the actual conditions at the incident scene.

    i. Try to determine if the information received prior to arrival matches up with observable conditions at the scene.

2. Isolation - One of the primary tasks on arrival is establishing an initial perimeter. The Emergency Response Guidebook (ERG) contains recommendations that will help to determine appropriate isolation distances and protective actions even if the identity of the material is unknown.
    a. Control zones are areas that are designated based on safety and the degree of hazard present. Establishing control zones will provide additional safety for the responders on scene and will help reduce the spread of contamination. There are 3 primary control zones:

        (1) Hot Zone – the control zone surrounding the immediate area of the source of the hazard where there is a high probability of exposure to the materials.

        (2) Warm Zone – the control zone where hot zone support activities typically occur and where exposure is less likely but possible. Decontamination is typically set up in this area.

        (3) Cold Zone - the control zone where the command post and other support activities occur and where exposure to the material is unlikely.

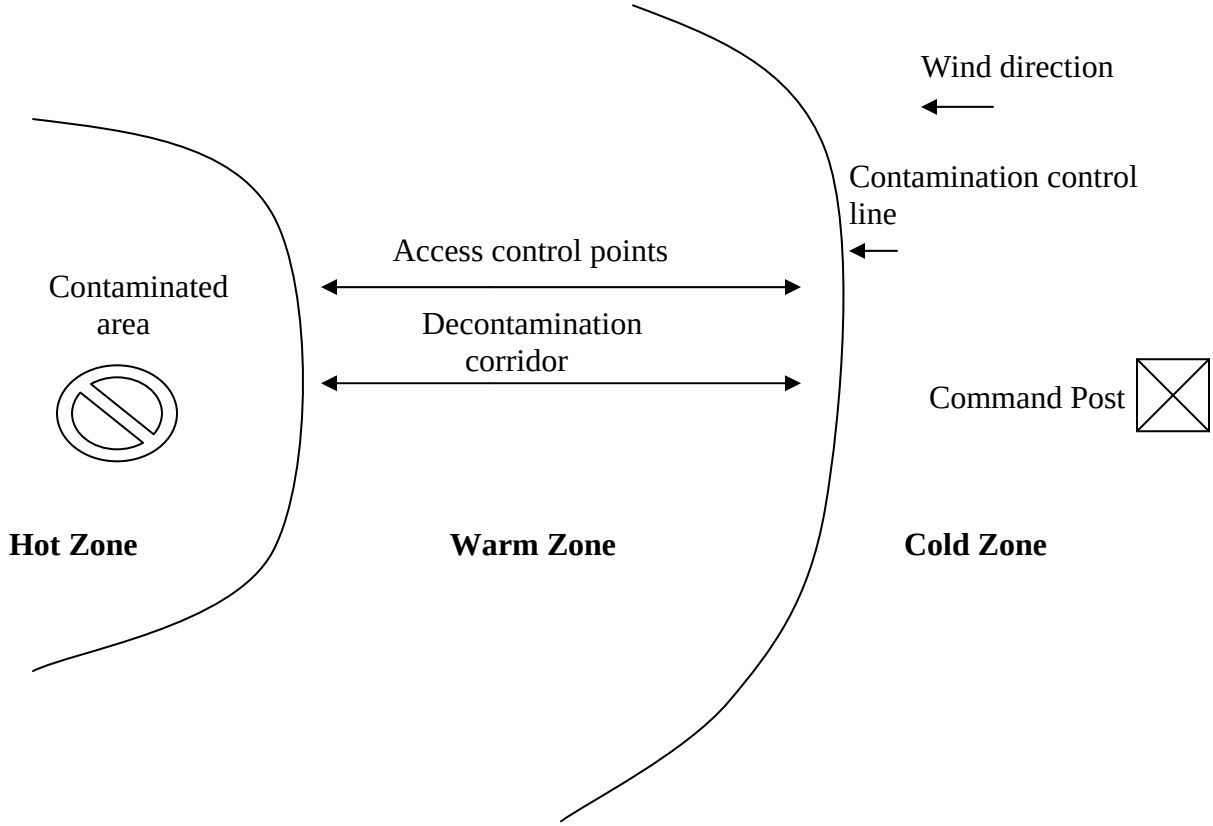


Diagram of Control Zones

3. Notifications - The New Mexico State Police ERO is the designated incident commander for hazmat incidents in the state of New Mexico.

    a. The ERO may decide not to respond to minor incidents that can be safely handled by local responders, and the notification may be all that is required for the incident.

    b. The initial incident commander may make other notifications as needed (Dispatch, P.D., FBI, Public Works, PNM, EOC, etc.).

4. Command and Management - Although the New Mexico State Police ERO is the designated incident commander for hazmat incidents occurring in New Mexico, the local responders will typically manage the incident unless the incident requirements exceed the capabilities and resources of the local responders.

    a. If an ERO responds, Hazmat Task Force personnel will usually manage the operational aspects of the incident working under the ERO who maintains overall responsibility for the incident.

    b. Some hazmat incidents may require a wide variety of equipment and other resources that are beyond the capabilities of local responders to obtain.

    c. Many hazmat incidents result in legal action being taken against responsible parties and even against the responders who operated at the scene. The New Mexico State Police ERO can provide valuable assistance in the management of these and other areas of the incident.

5. Identification and Hazard Assessment - Hazardous materials must be properly identified before any action options can be considered; failure to do so can significantly increase the hazards to the public, responders, property, and the environment.

    a. There are many sources of information that can be used to identify the material.

        (1) Shipping papers (quantity, name, type of materials, contact numbers, etc.).

        (2) Placards and labels (hazard class & division of material involved).

        (3) Container type (pressure / non-pressure; bulk or non-bulk packaging).

        (4) MSDS (Material Safety Data Sheets).

(5) Bystanders and the responsible party (try to validate information).

(6) NFPA 704 System (health, flammability, reactivity warnings).

(7) Emergency Response Guidebook (initial recommended actions).

(8) General observations at scene.

b. An initial Recon Team should be established and tasked with gathering and collecting information about the incident as soon as possible. Recon is an initial assessment (360^{0}) from a safe distance to gather critical information about the incident.

c. Once the material is identified, the next step is to conduct a hazard assessment. The hazard assessment is a realistic assessment of the overall magnitude of the incident and the threat that it presents to the community and responders. A thorough hazard assessment involves careful consideration of observable conditions at the scene.

(1) Physical & chemical properties of material involved.

(2) Quantity of materials involved (5 gallon bucket vs a rail car).

(3) Type of container involved (pressure vs non-pressure; bulk vs non-bulk).

(4) Exposures routes of materials involved.

(5) Stage of the event (beginning, middle, or end of the incident).

(6) Location of the incident (downtown vs rural area).

(7) Training, resources, and capabilities of responders.

6. Action Planning - Action planning is generally based on the analysis of information gathered during the identification and hazard assessment. Once the nature, size, and complexity of the problem is identified, command must formulate an action plan.

    a. Action planning can be broken down into 3 simple steps:

        (1) Clearly and correctly identify the problem.

        (2) Conduct a realistic evaluation of the resources available to solve the problem.

        (3) Use available resources to solve the problem.

    b. Command should always weigh the risks involved vs the gains or desired outcomes of any action options under consideration. Best and worst case scenarios for each action option should be evaluated based upon the predicted likely behavior of the materials or containers involved.

    c. The ability to conduct sound action planning depends on the accuracy and thoroughness of the information gathered during the identification and hazard assessment phase, and the level of training, resources, and capabilities of responders at the scene.

7. Personal Protective Equipment - Hazardous materials can enter the body through 4 primary exposure routes: inhalation, ingestion, absorption, and injection.

    a. Personal protective equipment (PPE) is divided into 4 categories based on the degree of protection offered to the responder.

        (1) Level A – Highest level of skin, respiratory, and eye protection.

        (2) Level B – Highest level of respiratory protection; less skin.

        (3) Level C - Air purifying respirator (APR), modest skin

(Essentially Level B with an APR instead of SCBA).

(4) Level D – Ordinary work uniform
(Note: Firefighter turnout gear is considered Level D).

b. Determining the appropriate level of PPE for a hazmat incident involves the evaluation of several factors.

(1) Physical and chemical properties of the materials involved.

(2) Exposure routes of the materials involved.

(3) Type of operations being conducted.

(4) Nature of the incident.

8. Containment and Control - There are 3 basic strategies for containment and control. In order to identify the best strategy for the incident, it is helpful to consider the likely outcome of each strategy and whether or not the benefits outweigh the risks involved. The following are the 3 basic containment and control strategies:

a. Non-intervention strategy - Isolate the area and deny entry, take appropriate public protective actions (shelter-in-place or evacuation), and let the incident run its course.

b. Defensive strategy - Actions that do not require personnel to make contact with the material or container, that are designed to restrict, slow, or redirect spread of hazardous material.

(1) Defensive strategies focus on containment (dike, dam, divert, cover, vapor dispersion, remote shut-offs, etc.).

c. Offensive strategy - Actions placing personnel in potential contact with the material and container.

1) Offensive strategies focus on slowing or stopping release (patch, plug, overpack, transfer, vapor

dispersion, neutralization, pressure reduction tactics, etc.).

(2) Includes defensive-oriented actions that may place personnel in close proximity to the material and container.

9. Public Protective Actions – These are actions taken by responders to protect the public from exposure to hazardous materials.

a. There are 2 general types of public protective actions.

(1) Evacuation - safely relocating people from a threatened area to a safe area.

(2) Shelter-in-place - actions designed to protect people in place rather than relocating them to a safer area.

(3) A limited evacuation may be appropriate in some cases. There are several factors to consider when determining the appropriate public protective actions at an incident.

(a) Materials involved.

(b) Population threatened.

(c) Time factor involved.

(d) Current and predicted weather.

(e) Resources and capabilities of responders.

(f) Common sense.

(4) Consideration of these factors is a process that weighs the risks involved against the overall gain (desired outcome) of protecting life, property, and the environment.

(a) An evacuation may be the appropriate action to take, but there may not be enough resources or time to safely accomplish it

(b) A material may be so toxic that it may be more appropriate to shelter-in-place rather than cause accidental exposure to the public during an evacuation

(c) Command must continuously reassess and evaluate incident conditions in order to determine the appropriate public protective actions for the incident

10. Decontamination - The goal of decontamination is to prevent the spread of contamination by removing hazardous materials from people and equipment.

    a. Primary decon is the standard layout for hazmat personnel entering a hazardous environment.

    b. Emergency decon is a type of rapid, urgent decontamination that may simply consist of a hoseline off of an engine company.

    c. Mass decon is a term used to describe the decontamination of a large number of victims and requires specialized resources and training.

11. Disposal - It is the Albuquerque Fire Department's policy not to take possession or dispose of hazardous materials. The designated responsible party for the incident must make arrangements to handle this phase of incident operations. Incidents involving orphan hazardous materials may require assistance from the state, county, or other City agencies.

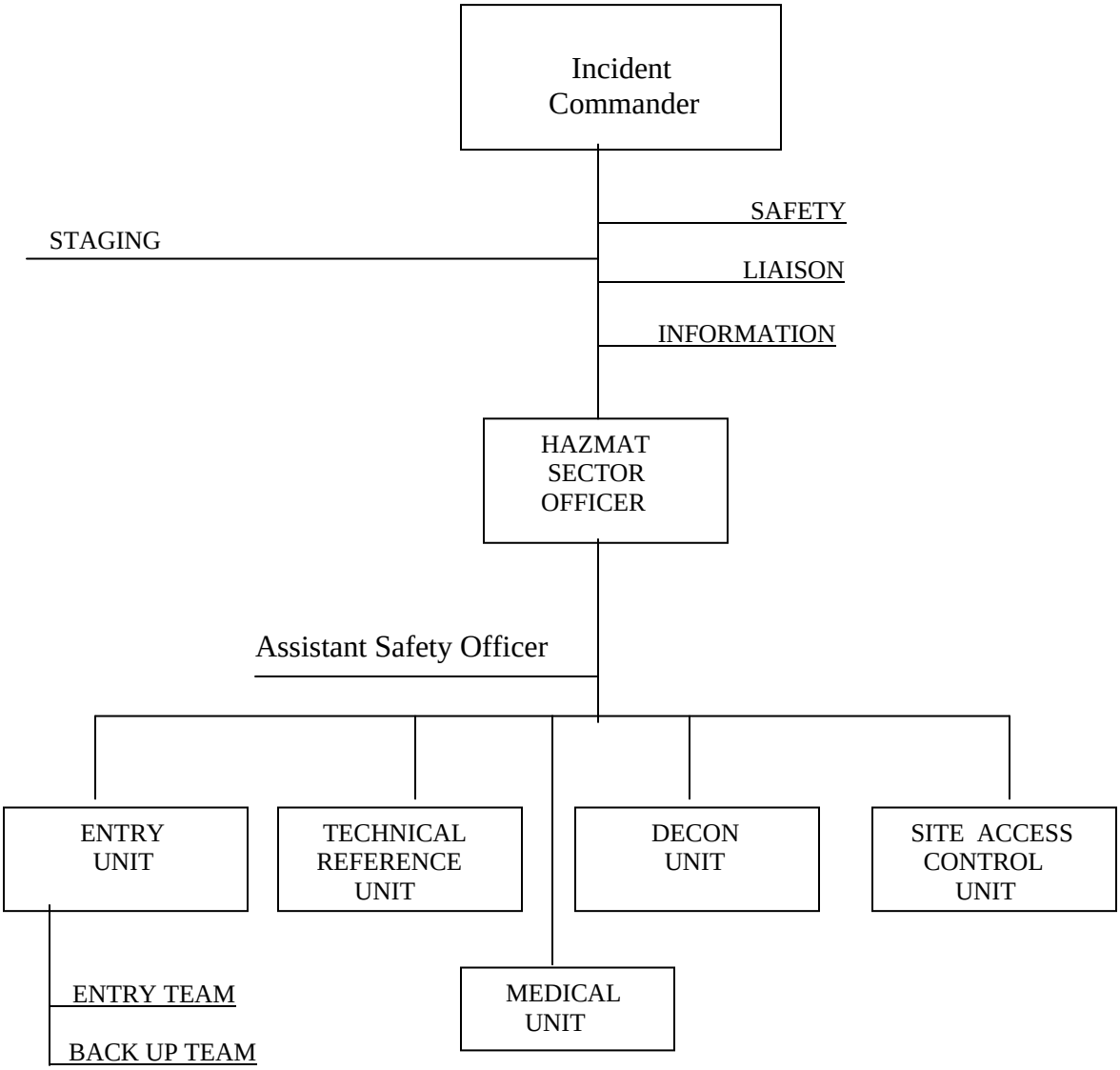
12. Documentation - Hazardous materials incidents typically involve liability issues. Although responders may not have caused the incident, they are held accountable for their actions regarding the adherence to recognized laws, regulations, and standards for the purposes of protecting life, property, and the environment at hazardous materials incidents.

IV. Hazmat Incident Organizational Structure

A. Regardless of the type of incident management system used, there will be standard functions and tasks that will be required at these types of events. The following organizational chart represents the basic management structure for a simple hazmat incident.

SOG Committee Action	Implemented 07/01/08	Revision	Implemented 07/01/08

HAZMAT ORGANIZATIONAL STRUCTURE



B. Hazmat ICS Checklists and Forms - Hazmat Task Force personnel utilize a system of checklists and forms as part of an overall incident management strategy.

1. The checklists identify the primary responsibilities of each position in the hazmat organizational structure, and identify whether or not a form for the position is required to be filled out.

2. The forms are a means of collecting and documenting critical information and provide command with relevant details that are important for the overall management of the incident and the safety of personnel operating at the scene.

3. Once it is determined that a “legitimate” hazmat incident exists, personnel are assigned positions within the organizational structure and the checklists and forms are distributed accordingly.

4. One of the main advantages of this approach is that each functional area of responsibility identified in the hazmat organizational structure is able to accomplish specific tasks that have been identified simultaneously. This approach results in a more efficient use of time and personnel assigned to the incident.

C. Hazmat IC Checklists and Forms are found in Appendix A.