

**FIRE FIGHTER ADVISORY COMMITTEE
AGENDA
March 26, 2010, 10:00 A.M.
William B. Travis Building, Room 1-111, Austin, Texas**

The Fire Fighter Advisory Committee will convene in open session to deliberate and possibly take formal action on any of the following agenda items:

1. Roll call – 10:00 a.m.
2. Adoption of the December 3, 2009, Fire Fighter Advisory Committee meeting minutes.
3. Report from the Curriculum and Testing Committee with discussion and possible action regarding update to Chapter One, Basic Fire Suppression Curriculum to NFPA 1001 Standard for Fire Fighter Professional Qualifications, 2008 Edition and Chapter Six, Hazardous Materials Technical Curriculum to NFPA 472, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents.
4. Discussion and possible recommendation regarding proposed changes to 37 TAC, Chapter 429, Minimum Standards for Fire Inspectors, Subchapter B, including, but not limited to §429.203, Minimum Standards for Basic Fire Inspector Certification—New Track.
5. Discussion and possible recommendation regarding proposed changes to 37 TAC, Chapter 431, Fire Investigation, Subchapter A, including, but not limited to new §431.3 Minimum Standards for Basic Arson Investigator Certification.
6. Discussion and possible recommendation regarding proposed rule changes to 37 TAC, Chapter 435, Fire Fighter Safety, including, but not limited to §435.1, Protective Clothing to include; rubber boots and proximity gear for ARFF training.
7. Discussion and possible recommendation on proposals regarding firefighting helmets and minimum THL for bunker gear being considered by the NFPA 1971 Committee.
8. Discussion and possible action on future meeting dates, agenda items, and locations.
9. Adjourn meeting.

1. Roll call – 10:00 a.m.

2. Adoption of the December 3, 2009, Fire Fighter Advisory Committee meeting minutes.

TEXAS COMMISSION ON FIRE PROTECTION

Presiding Officer Jim Reidy called the December 3, 2009 meeting of the Fire Fighter Advisory Committee to order at 10:00 a.m. at the William B. Travis Building, 1701 N. Congress Ave., Room 1-104, in Austin, Texas.

Attending	Jim Reidy Tommy Anderson David Hudgins	Leonardo Perez Amado Cano, Jr.* J. P. Steelman	Michael Wisko Daniel DeYear Michael Jones
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*absent entire meeting
**absent part of meeting

Staff	Jake Soteriou Dianne Hudson	Miles Skipper Larry Whitis	Tim Rutland Mollie Clakley	Deborah Cowan Jim Crowson, Assistant Attorney General
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| 1. Roll call | Secretary Michael Wisko called roll and 8 of 9 members were present. |
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| 2. Adoption of Minutes committee | A motion was made by David Hudgins and seconded by J.P. Steelman to approve the minutes of the September 11, 2009, fire fighter advisory meeting as discussed. The motion carried. |
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| 3. Report from Testing Committee Curriculum and the | Pat McAuliff, Chairman of the committee, gave a brief update on activities of last committee meeting and future committee meetings. |
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| 4. 37 TAC, Chapter 421 | A motion was made by Tommy Anderson and seconded by David Hudgins to accept the recommended changes to 37 TAC, Chapter 421, §421.9 and §421.11 as discussed. The motion carried. |
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| 5. 37 TAC, Chapter 423 | A motion was made by Michael Wisko and seconded by Leonardo Perez to accept the recommended changes to 37 TAC Chapter 423, §423.3 and §423.13 as discussed. The motion carried. |
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| 6. 37 TAC, Chapter 425 | A motion was made by Tommy Anderson and seconded by Michael Wisko to accept the recommended changes to 37 TAC Chapter 425, §§425.1, 425.3, 425.5 and 425.7 as discussed. The motion carried. |
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| 7. 37 TAC, Chapter 427 | A motion was made by J. P. Steelman and seconded by Michael Wisko to accept the recommended changes to 37 TAC Chapter 427. |
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After discussion, a motion to table for further review was made by Daniel DeYear and seconded by Michael Wisko. The motion carried.

After further review, a motion was made by J. P. Steelman and seconded by Michael Wisko to accept the recommended changes to 37 TAC Chapter 427, §§ 427.18, 427.301, 427.303, and 427.305 with changes as discussed. The motion carried.
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| 8. | 37 TAC,
Chapter 439 | A motion was made by Tommy Anderson and seconded by Daniel DeYear to accept the recommended changes to 37 TAC, Chapter 439, §439.11 as discussed. The motion carried. |
| 9. | 37, TAC
Chapter 453 | A motion was made by Michael Wisko and seconded by Tommy Anderson to accept the recommended changes to 37 TAC, Chapter 453, §453.7 as discussed. The motion carried. |
| 10. | Future meeting
dates | The next meeting was scheduled for March 26, 2010 at 10:00 AM. |
| 11. | Adjournment | A motion to adjourn was made by Tommy Anderson and seconded by J. P. Steelman. The motion carried. |

Jim Reidy
Presiding Officer

3. Report from the Curriculum and Testing Committee with discussion and possible action regarding update to Chapter One, Basic Fire Suppression Curriculum to NFPA 1001 Standard for Fire Fighter Professional Qualifications, 2008 Edition and Chapter Six, Hazardous Materials Technical Curriculum to NFPA 472, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents.

REFERENCE LIST FOR THE BASIC FIRE SUPPRESSION CURRICULUM

Certified Training Facilities approved to teach this curriculum, must have the following reference materials:

Certification Curriculum Manual. Austin, TX: Texas Commission on Fire Protection. Current issue.

Essentials of Fire Fighting (5th ed.) (2007). Stillwater, OK: Fire Protection Publications. International Fire Service Training Association.

Firefighter's Handbook: Essentials of Firefighting and Emergency Response (3rd ed.) (2008). Clifton Park NY: Thomson Delmar Learning.

Fundamentals of Fire Fighter Skills (2nd ed.) (2008). Sudbury, MA: Jones and Bartlett Publishers, Inc.

NFPA 1001: Standard for Fire Fighter Professional Qualifications (2008 ed.). Quincy, MA: NFPA Publications. National Fire Protection Association.

Standards Manual for Fire Protection Personnel. Austin, TX: Texas Commission on Fire Protection. Current issue.

CHAPTER ONE FIRE SUPPRESSION CURRICULUM OUTLINE

INTRODUCTION

Testing committee members met for the first time on August 24, 1989 in response to the charge set forth by the Commission for the development of a written and practical examination. The intent of the exam was to verify practical skills and knowledge necessary for the performance of a basic firefighter within the State of Texas.

Initially, the twenty-one member committee included chiefs, training officers, college instructors and firefighters. After the committee responded to the Commission with its findings, Commissioners presented the committee with the additional charge of evaluating the existing basic firefighter curriculum and formulating changes necessary to implement the testing program. After many meetings filled with professional criticism and introspect, the committee developed competencies and specific learning objectives as the minimum requirement for certification as a basic firefighter in the State of Texas.

An additional goal, set by the Commission and charged to the testing committee, was to ensure the learning objectives in the curriculum met the objectives of NFPA 1001, *Standard for Fire Fighter Professional Qualifications*. This provides a good foundation, which made way for national accreditation by the International Fire Service Accreditation Congress.

Upon a recommendation in December 1991, through action of the Fire Protection Personnel Advisory Committee and the Commission, approximately one-third of the original twenty-one members were asked to maintain an active role on the committee. In January 1994, there were two more members added to the testing committee. The current Curriculum and Testing Committee consists of ten fire service professionals from around the state.

The committee developed the competencies and objectives focusing on the minimum requirements for a basic firefighter in Texas. The amount of questioning and discussion incurred at the meetings, along with the mixture of diverse fire service professionals representing areas within the state, serve as a means for validating the competencies and objectives. It is in the spirit of the fire service of Texas that these individuals contributed to the development of a workable curriculum.

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**CHAPTER ONE
BASIC FIRE SUPPRESSION
CURRICULUM OUTLINES**

BASIC FIRE SUPPRESSION		
SECTIONS	SUBJECT	RECOMMENDED HOURS
101-5.1; 102-6.1	General	60
101-5.2; 102-6.2	Fire Department Communications	12
101-5.3; 102-6.3	Fireground Operations	306
102-6.4	Rescue Operations	32
101-5.5; 102-6.5	Prevention, Preparedness, and Maintenance	72
601; 602; 603-6.2; 603-6.6	Hazardous Materials Awareness, Operations, Mission Specific as identified in Chapter 6	56
	TOTAL RECOMMENDED HOURS	538*

*TOTAL RECOMMENDED HOURS include Fire Fighter I, Fire Fighter II, Awareness and Operations

FIREFIGHTER I CURRICULUM OUTLINE		
SECTION	SUBJECT	RECOMMENDED HOURS
101-5.1	General	40
101-5.2	Fire Department Communications	4
101-5.3	Fireground Operations	222
101-5.4	(Reserved for future use)	
101-5.5	Prevention, Preparedness, and Maintenance	28
	TOTAL RECOMMENDED HOURS	294

FIREFIGHTER II CURRICULUM OUTLINE		
SECTION	SUBJECT	RECOMMENDED HOURS
102-6.1	General	20
102-6.2	Fire Department Communications	8
102-6.3	Fireground Operations	84
102-6.4	Rescue Operations	32
102-6.5	Prevention, Preparedness, and Maintenance	44
	TOTAL RECOMMENDED HOURS	188

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SECTION 101

BASIC FIRE SUPPRESSION – FIREFIGHTER I

A Basic Structure Fire Protection Personnel is a Fire Fighter who has met all the job performance requirements (JPR) of Fire Fighter I and Fire Fighter II as defined in NFPA 1001 *Standard for Fire Fighter Professional Qualifications*. In order to satisfactorily meet these requirements, the Fire Fighter trainee must meet all the job performance requirements and demonstrate mastery of all the knowledge, skills, and ability requirements of the following components of the Texas Commission on Fire Protection Curriculum Manual:

- Chapter 1, Section 101 - 5 Basic Fire Suppression - Firefighter I
- Chapter 1, Section 102 - 6 Basic Fire Suppression - Firefighter II
- Chapter 6, Section 601 - 4 Hazardous Materials Awareness
- Chapter 6, Section 602 - 5 Hazardous Materials Operations
- Chapter 6, Section 603 - 6.2 Hazardous Materials Operations - Mission Specific Competencies - Using Personal Protective Equipment
- Chapter 6, Section 603 - 6.6 Hazardous Materials Operations - Mission Specific Competencies - Product Control

101-5.1 **General**

101-5.1.1 **General Knowledge Requirements**

The organization of the fire department; the role of the Fire Fighter I in the organization; the mission of fire service; the fire department's standard operating procedures (SOPs) and rules and regulations as they apply to the Fire Fighter I; the role of other agencies as they relate to the fire department; aspects of the fire department's member assistance program; the importance of physical fitness and a healthy lifestyle to the performance of the duties of a fire fighter; the critical aspects of NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, as they apply to the Fire Fighter I; knot types and usage; the difference between life safety and utility rope; reasons for placing rope out of service; the types of knots to use for given tools, ropes, or situations; hoisting methods for tools and equipment; and using rope to support response activities.

1. Organization of the fire department
 - a. History
 - b. Organizational structure
2. The role of the Fire Fighter I

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3. Mission of the fire service
 - a. Emergency activities
 - b. Non-emergency activities
4. Role of other agencies as they relate to the fire department
 - a. Private entities
 - b. Local
 - c. Regional
 - d. State
 - e. Federal
5. Aspects of the fire department's member assistance program
 - a. Critical Incident Stress Management (CISM)
 - b. Member Assistance Programs (MAP)
6. Importance of physical fitness and a healthy lifestyle to the performance of duties of a fire fighter
7. The critical aspects of NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*
8. The combustion process and key terms associated with fire science
 - a. The four products of combustion commonly found in structural fires that create a life hazard.
 - i. Flame
 - ii. Heat
 - iii. Smoke
 - iv. Gases and irritants
 - b. Key terms
 - i. Fire
 - ii. Flash point
 - iii. Ignition temperature
 - iv. Fire point
 - v. Flammable or explosive range
 - a) LEL
 - b) UEL
 - vi. Boiling point
 - vii. Oxidation
 - viii. Pyrolysis
 - ix. Reducing agent
 - x. Vaporization
 - xi. Combustion
 - xii. Vapor density
 - xiii. Specific gravity

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- xiv. Thermal layering/heat stratification/thermal balance
9. Fire theory
- a. Key terms
 - i. Fire triangle
 - ii. Fire tetrahedron
 - b. Describe the relationship of the concentration of oxygen to combustibility and life safety
10. Identify and describe heat energy sources
- a. Chemical heat energy
 - b. Electrical heat energy
 - c. Mechanical heat energy
 - d. Nuclear heat energy
11. The stages of a fire and describe the appropriate action to be taken for extinguishment
- a. Conditions and associated hazards and the appropriate actions to be taken for extinguishment
 - i. Ignition
 - ii. Growth
 - iii. Flashover
 - iv. Fully developed/fully involved
 - v. Decay
 - b. Special conditions that occur during a fire's growth
 - i. Flameover/rollover
 - ii. Thermal layering
 - iii. Backdraft
 - c. Methods of heat transfer
 - i. Conduction
 - ii. Convection
 - iii. Radiation
 - iv. Direct flame impingement
12. Physical states of matter in which fuels are commonly found
- a. Define and describe three types of fuel
 - i. Solid fuel
 - ii. Liquid fuel
 - iii. Gaseous fuel
 - b. Define and describe the chemical and physical properties of fuels
 - i. Specific gravity
 - ii. Vapor density

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- iii. The theory of surface to mass ratio as it relates to the combustion process
13. Identify and describe chemical by-products of combustion
- a. Poisonous gases and irritants common in smoke
 - i. Carbon dioxide
 - ii. Carbon monoxide
 - iii. Hydrogen cyanide
14. Identify and describe the units of heat measurement
- a. British thermal unit (BTU)
 - b. Fahrenheit (°F)
 - c. Celsius (°C)
 - d. Calorie (C)
15. Identify and describe the fire extinguishment theory
- a. Describe the fire extinguishment theory
 - b. Identify and describe four methods of extinguishment
 - i. Temperature reduction
 - ii. Fuel removal
 - iii. Oxygen exclusion
 - iv. Inhibiting chemical reaction
16. Identify and describe the characteristic of water as it relates to its fire extinguishing potential
- a. Identify and describe the physical characteristics of water
 - b. Identify and describe the Law of Specific Heat
 - c. Identify and describe the Law of Latent Heat
 - d. Identify and describe the advantages and disadvantages of water as an extinguishing agent
 - e. Identify and describe the law of heat flow
17. Ropes and knots
- a. Knot types and use
 - i. Safety knot or overhand knot
 - ii. Half hitch
 - iii. Clove hitch
 - iv. Figure 8
 - v. Figure 8 on a bight
 - vi. Figure 8 with a follow through
 - vii. Bowline
 - viii. Sheet bend or becket bend
 - b. Differentiating between life safety and utility rope
 - i. Natural

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- ii. Synthetic
- c. Reasons for placing rope out of service
 - i. Inspection
 - a) Routine
 - b) After use
 - ii. Storage
 - iii. Maintenance
- d. Types of knots used for given tools, ropes or situations
 - i. Hoisting an axe
 - ii. Pike pole
 - iii. Hose
 - iv. Ladder
 - v. Power tools or fans
- e. Hoisting methods for tools and equipment
- f. Using rope to support response activities
 - i. Utility
 - ii. Life safety/rescue

101-5.1.2 General Skill Requirements

The ability to don personal protective clothing within 1 minute; doff personal protective clothing and prepare for reuse; hoist tools and equipment using ropes and the correct knot; and locate information in departmental documents and standard or code materials.

1. Types of Personal Protective Equipment (PPE) ensembles
 - a. Station/work uniforms
 - b. Structural firefighting
 - c. Wildland firefighting
 - d. Emergency medical service (EMS)
 - e. Specialized ensembles (i.e., ARFF, technical rescue)
2. Donning
3. Doffing/prepare for re-use
4. Care and maintenance
 - a. Basic inspection
 - b. Advanced inspection
 - c. Record keeping

101-5.2 Fire Department Communications

This duty shall involve initiating responses, receiving telephone calls, and using fire department communications equipment to correctly relay verbal or written information, according to the JPRs in 5.2.1 through 5.2.3.

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101-5.2.1 Initiate the response to a reported emergency, given the report of an emergency, fire department SOPs, and communications equipment, so that all necessary information is obtained, communications equipment is operated correctly, and the information is relayed promptly and accurately to the dispatch center.

Requisite Knowledge: Procedures for reporting an emergency, departmental SOPs for taking and receiving alarms, radio codes or procedures, and information needs of dispatch center.

1. Procedures for reporting an emergency
 - a. Conventional phone
 - b. Cellular phone
 - c. Call box
 - d. Telecommunication Devices for the Deaf (TDD)
 - e. Still alarms or walk-ins
 - f. Automatic alarms
2. Departmental SOPs for taking and receiving alarms
 - a. Nature of emergency
 - b. Location of emergency
 - c. Caller information
 - d. Responding units
 - e. Call back number
3. Radio codes or procedures
 - a. Clear speech – plain English
 - b. Emergency communications – Mayday
4. Information needs of dispatch center
 - a. Nature of emergency
 - b. Location of emergency
 - c. Caller information
 - d. Responding units
 - e. Call back number

Requisite Skills: The ability to operate fire department communications equipment, relay information, and record information.

101-5.2.2 Receive a telephone call, given a fire department phone, so that procedures for answering the phone are used and the caller's information is relayed.

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Requisite Knowledge: Fire department procedures for answering nonemergency telephone calls.

1. Department standard operating procedures (SOPs)
2. Phone etiquette

Requisite Skills: The ability to operate fire station telephone and intercom equipment.

101-5.2.3 Transmit and receive messages via the fire department radio, given a fire department radio and operating procedures, so that the information is accurate, complete, clear, and relayed within the time established by the authority having jurisdiction (AHJ).

Requisite Knowledge: Departmental radio procedures and etiquette for routine traffic, emergency traffic, and emergency evacuation signals.

1. Departmental radio procedures and etiquette for routine traffic
2. Departmental radio procedures and etiquette for emergency traffic
3. Departmental radio procedures and etiquette for emergency evacuation procedures

Requisite Skills: The ability to operate radio equipment and discriminate between routine and emergency traffic.

101-5.3 **Fireground Operations**

This duty shall involve performing activities necessary to ensure life safety, fire control, and property conservation, according to the JPRs in 5.3.1 through 5.3.19.

101-5.3.1 Use self-contained breathing apparatus (SCBA) during emergency operations, given SCBA and other personal protective equipment, so that the SCBA is correctly donned and activated within 1 minute, the SCBA is correctly worn, controlled breathing techniques are used, emergency procedures are enacted if the SCBA fails, all low-air warnings are recognized, respiratory protection is not intentionally compromised, and hazardous areas are exited prior to air depletion.

Requisite Knowledge: Conditions that require respiratory protection, uses and limitations of SCBA, components of SCBA, donning procedures,

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breathing techniques, indications for and emergency procedures used with SCBA, and physical requirements of the SCBA wearer.

1. Conditions that require respiratory protection
 - a. Oxygen deficiency
 - b. Elevated temperatures
 - c. Toxic environments
 - d. Smoke (by-products of combustion)

2. Uses and limitations of SCBA
 - a. Wearer
 - i. Facial and long hair
 - ii. Protective clothing
 - iii. Donning
 - a) Properly donned and activated in 1-minute time
 - b) SCBA correctly worn
 - iv. Eyeglasses or contact lenses
 - v. Use in high or low temperatures
 - vi. Accidental submersion
 - vii. Communication
 - viii. Working in teams
 - ix. Personal alert safety system (PASS)
 - x. Doffing
 - xi. Physical conditioning
 - b. Equipment
 - c. Air supply

3. Types of SCBA
 - a. Open circuit
 - b. Closed circuit
 - c. Supplied air respirators (SARs)

4. Components of SCBA
 - a. Backpack and harness assembly
 - b. Air cylinder assembly
 - c. Regulator assembly
 - d. Face piece assembly
 - e. PASS device
 - f. Rapid Intervention Crew/Universal Air Connection (RIC/UAC)

5. Donning and doffing procedures
 - a. Over-the-head method
 - b. Coat method

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- c. Seat mounted
 - d. Compartment mounted
6. Breathing techniques
- a. Controlled breathing
 - b. Buddy breathing
7. Indications for and emergency procedures used with SCBA
- a. Use of emergency by-pass or purge valve
 - b. Rapid Intervention Crew/Universal Air Connection (RIC/UAC)
 - c. Conservation of air
8. Physical requirements of the SCBA wearer
- a. Cardiovascular conditioning
 - b. Respiratory conditioning
 - c. Psychological/emotional stability
9. Maintenance and Inspections
- a. Replacing a cylinder
 - b. Refilling a cylinder
 - c. Cleaning
 - d. Inspections
 - i. Daily
 - ii. Monthly
 - iii. Annually

Requisite Skills: The ability to control breathing, replace SCBA air cylinders, use SCBA to exit through restricted passages, initiate and complete emergency procedures in the event of SCBA failure or air depletion, and complete donning procedures.

- 101-5.3.2** Respond on apparatus to an emergency scene, given personal protective clothing and other necessary personal protective equipment, so that the apparatus is correctly mounted and dismounted, seat belts are used while the vehicle is in motion, and other personal protective equipment is correctly used.

Requisite Knowledge: Mounting and dismounting procedures for riding fire apparatus, hazards and ways to avoid hazards associated with riding apparatus, prohibited practices, and types of department personal protective equipment and the means for usage.

1. Mounting procedures for riding fire apparatus

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- a. Hand grip
 - b. Footing
 - c. Seatbelt
2. Dismounting procedures for riding fire apparatus
 3. Hazards associated with riding fire apparatus
 4. Ways to avoid hazards associated with riding fire apparatus
 - a. Seated and utilizing safety restraints
 - b. Hearing protection, if required
 - c. Secure loose objects in cab
 5. Prohibited practices
 - a. Donning PPE while in motion
 - b. Riding on the tailboard/sideboards
 6. Types of departmental personal protective equipment (PPE) and the means for usage
 - a. Safety bars/gates
 - b. Safety chains

Requisite Skills: The ability to use each piece of provided safety equipment.

- 101-5.3.3** Establish and operate in work areas at emergency scenes, given protective equipment, traffic and scene control devices, structure fire and roadway emergency scenes, traffic hazards and downed electrical wires, an assignment, and SOPs, so that procedures are followed, protective equipment is worn, protected work areas are established as directed using traffic and scene control devices, and the fire fighter performs assigned tasks only in established, protected work areas.

Requisite Knowledge: Potential hazards involved in operating on emergency scenes including vehicle traffic, utilities, and environmental conditions; proper procedures for dismounting apparatus in traffic; procedures for safe operation at emergency scenes; and the protective equipment available for members' safety on emergency scenes and work zone designations.

1. Potential hazards involved in operating on emergency scenes
 - a. Vehicle traffic
 - b. Utilities
 - c. Environmental conditions

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2. Proper procedures for dismounting apparatus in traffic
3. Procedures for safe operation at emergency scenes
4. Protective equipment available for members' safety on emergency scenes
5. Protective equipment available for members' safety work zone designations

Requisite Skills: The ability to use personal protective clothing, deploy traffic and scene control devices, dismount apparatus, and operate in the protected work areas as directed.

- 101-5.3.4** Force entry into a structure, given personal protective equipment, tools, and an assignment, so that the tools are used as designed, the barrier is removed, and the opening is in a safe condition and ready for entry.

Requisite Knowledge: Basic construction of typical doors, windows, and walls within the department's community or service area; operation of doors, windows, and locks; and the dangers associated with forcing entry through doors, windows, and walls.

1. Basic construction types within the department's community or service area
 - a. Doors
 - i. Swinging doors
 - a) Inward opening
 - b) Outward opening
 - c) Double swing
 - ii. Wooden doors
 - iii. Metal doors
 - iv. Tempered plate glass doors
 - v. Revolving doors
 - vi. Sliding doors
 - vii. Overhead doors
 - viii. Fire doors
 - b. Windows
 - i. Checkrail windows (double-hung)
 - ii. Casement windows (hinged)
 - iii. Projected windows (factory)
 - iv. Awning and jalousie windows
 - v. Plastic windows (high security)

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- vi. Screened or barred windows
- c. Walls
 - i. Masonry and veneered walls
 - ii. Metal walls
 - iii. Wood frame walls
 - iv. Partition walls
- 2. Operation
 - a. Doors
 - b. Windows
 - c. Locks
- 3. Dangers associated with forcing entry
 - a. Through doors
 - b. Through windows
 - c. Through walls
- 4. Tools
 - a. Cutting tools
 - b. Prying tools
 - c. Pushing/pulling tools
 - d. Striking tools
- 5. Maintenance of tools
 - a. Axe heads and cutting edges
 - b. Wooden handles
 - c. Fiberglass handles
 - d. Unprotected metal surfaces
 - e. Power equipment

Requisite Skills: The ability to transport and operate hand and power tools and to force entry through doors, windows, and walls using assorted methods and tools.

- 101-5.3.5** Exit a hazardous area as a team, given vision-obscured conditions, so that a safe haven is found before exhausting the air supply, others are not endangered, and the team integrity is maintained.

Requisite Knowledge: Personnel accountability systems, communication procedures, emergency evacuation methods, what constitutes a safe haven, elements that create or indicate a hazard, and emergency procedures for loss of air supply.

- 1. Personnel accountability systems

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- a. Passport
 - b. Tag system
 - c. Electronic system
2. Communication procedures
 - a. Radio
 - b. Face to face
 - c. Tagline
 - d. Evacuation signal
 3. Emergency evacuation methods
 - a. Roof escape
 - b. Balcony escape
 - c. Self rescue
 - d. Ladder escape
 - e. Room escape
 4. What constitutes a safe haven/refuge
 - a. Absence of immediately dangerous to life and health (IDLH) hazard
 - b. Area outside of collapse zone
 5. Elements that indicate or create a hazard
 6. Emergency procedures for loss of air supply
 - a. Stay calm/don't panic
 - b. Activate PASS device
 - c. Declare Mayday

Requisite Skills: The ability to operate as a team member in vision-obscured conditions, locate and follow a guideline, conserve air supply, and evaluate areas for hazards and identify a safe haven.

- 101-5.3.6** Set up ground ladders, given single and extension ladders, an assignment, and team members if needed, so that hazards are assessed, the ladder is stable, the angle is correct for climbing, extension ladders are extended to the necessary height with the fly locked, the top is placed against a reliable structural component, and the assignment is accomplished.

Requisite Knowledge: Parts of a ladder, hazards associated with setting up ladders, what constitutes a stable foundation for ladder placement, different angles for various tasks, safety limits to the degree of angulation, and what constitutes a reliable structural component for top placement.

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1. Parts of a ladder
 - a. Beam
 - b. Bed section
 - c. Butt
 - d. Butt spur
 - e. Fly section
 - f. Guides
 - g. Halyard
 - h. Heat sensor label
 - i. Hooks
 - j. Pawls (dogs)
 - k. Protection plates
 - l. Pulley
 - m. Rail
 - n. Rung
 - o. Staypole
 - p. Stops
 - q. Tie rod
 - r. Tip

2. Hazards associated with setting up ladders
 - a. Overhead obstruction (energized power lines)
 - b. Lifting and moving
 - c. Uneven terrain
 - d. Soft spots
 - e. High traffic areas (doorways)
 - f. Exposure to flame or heat

3. What constitutes a stable foundation for ladder placement
 - a. Flat, stable surface
 - b. Non-skid surface

4. Different angles for various tasks
 - a. Roof
 - b. Window
 - i. Entry
 - ii. Ventilation or working
 - iii. Rescue set

5. Safety limits to the degree of angulation

6. What constitutes a reliable structural component for top placement

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Requisite Skills: The ability to carry ladders, raise ladders, extend ladders and lock flies, determine that a wall and roof will support the ladder, judge extension ladder height requirements, and place the ladder to avoid obvious hazards.

101-5.3.7 Attack a passenger vehicle fire operating as a member of a team, given personal protective equipment, attack line, and hand tools, so that hazards are avoided, leaking flammable liquids are identified and controlled, protection from flash fires is maintained, all vehicle compartments are overhauled, and the fire is extinguished.

Requisite Knowledge: Principles of fire streams as they relate to fighting automobile fires; precautions to be followed when advancing hose lines toward a automobile; observable results that a fire stream has been properly applied; identifying alternative fuels and the hazards associated with them; dangerous conditions created during an automobile fire; common types of accidents or injuries related to fighting automobile fires and how to avoid them; how to access locked passenger, trunk, and engine compartments; and methods for overhauling an automobile.

1. Principles of fire streams as they relate to vehicle fires
 - a. Straight stream
 - b. Full fog
 - c. Power cone
2. Precautions to be followed when advancing hose lines toward a vehicle
 - a. Uphill
 - b. Upwind
 - c. 45 degree angle approach
3. Observable results that a fire stream has been properly applied
4. Identifying alternative fuels and the hazards associated with them
 - a. Compressed Natural Gas (CNG)
 - b. Liquefied Petroleum Gas (LPG)
 - c. Ethanol
 - d. High Voltage Electrical Power
5. Dangerous conditions created during a vehicle fire
 - a. Energy absorbing bumpers
 - b. Hydraulic pistons (supports)
 - i. Hatchbacks
 - ii. Trunks

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- iii. Tailgates
 - iv. Hoods
 - c. Shock absorbers/struts
 - d. Toxic byproducts of combustion
 - e. Supplemental Restraint System (SRS)
 - f. Side Impact Protection System (SIPS)
 - g. Batteries
 - h. Combustible metals
6. Common types of accidents or injuries related to fighting vehicle fires and how to avoid them
- a. Traffic hazards
 - b. Injuries
 - c. Respiratory
7. Access compartments
- a. Passenger
 - b. Trunk
 - c. Engine
8. Methods for overhauling a vehicle
- a. Chock wheels
 - b. Disable battery
 - c. Apply water thoroughly
 - d. Confirm no leaking fluids or fuels

Requisite Skills: The ability to identify automobile fuel type; assess and control fuel leaks; open, close, and adjust the flow and pattern on nozzles; apply water for maximum effectiveness while maintaining flash fire protection; advance 38 mm (1½ in.) or larger diameter attack lines; and expose hidden fires by opening all automobile compartments.

- 101-5.3.8** Extinguish fires in exterior Class A materials, given fires in stacked or piled and small unattached structures or storage containers that can be fought from the exterior, attack lines, hand tools and master stream devices, and an assignment, so that exposures are protected, the spread of fire is stopped, collapse hazards are avoided, water application is effective, the fire is extinguished, and signs of the origin area(s) and arson are preserved.

Requisite Knowledge: Types of attack lines and water streams appropriate for attacking stacked, piled materials and outdoor fires; dangers — such as collapse — associated with stacked and piled materials; various extinguishing agents and their effect on different

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material configurations; tools and methods to use in breaking up various types of materials; the difficulties related to complete extinguishment of stacked and piled materials; water application methods for exposure protection and fire extinguishment; dangers such as exposure to toxic or hazardous materials associated with storage building and container fires; obvious signs of origin and cause; and techniques for the preservation of fire cause evidence.

1. Types of attack lines and water streams appropriate for attacking stacked, piled materials and outdoor fires
 - a. Types of attack lines
 - i. $\frac{3}{4}$ or 1 inch (booster or reel line)
 - ii. $1\frac{1}{2}$ to $1\frac{3}{4}$ inches
 - iii. 2 to $2\frac{1}{2}$ inches
 - iv. 3 inch or greater
 - b. Water streams
 - i. Low volume (less than 40 GPM)
 - ii. Handline (40 to 350 GPM)
 - iii. Master (350 GPM or greater)
2. Dangers associated with stacked and piled materials
 - a. Collapse
 - b. Energized sources
 - c. Products of combustion
 - d. Increased weight (absorption of water)
 - e. Exposures
3. Various extinguishing agents and their effects on different material configurations
 - a. Water
 - i. Cooling
 - ii. Increased surface tension
 - b. Foam
 - i. Blanketing or smothering
 - ii. Cooling
 - iii. Decreased surface tension
4. Tools and methods to use in breaking up various types of materials
 - a. Tools
 - i. Pike pole
 - ii. Rubbish hook
 - iii. Rake
 - b. Heavy equipment
 - i. Tractor

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ii. Dozer

5. Difficulties related to complete extinguishment of stacked and piled materials
 - a. Agent penetration
 - b. Access
 - c. Density of material
 - d. Height and area of pile
6. Water application methods for exposure protection and fire extinguishment
 - a. Direct application
 - b. Indirect application
7. Dangers such as exposure to toxic or hazardous materials associated with storage building and container fires
8. Obvious signs of origin and cause
 - a. Burn pattern
 - b. Charring
 - c. Evidence of accelerants
 - d. Trailers
9. Techniques for the preservation of fire cause evidence
 - a. Protect evidence
 - b. Preserve area
 - c. Limit access

Requisite Skills: The ability to recognize inherent hazards related to the material's configuration, operate handlines or master streams, break up material using hand tools and water streams, evaluate for complete extinguishment, operate hose lines and other water application devices, evaluate and modify water application for maximum penetration, search for and expose hidden fires, assess patterns for origin determination, and evaluate for complete extinguishment.

- 101-5.3.9** Conduct a search and rescue in a structure operating as a member of a team, given an assignment, obscured vision conditions, personal protective equipment, a flashlight, forcible entry tools, hose lines, and ladders when necessary, so that ladders are correctly placed when used, all assigned areas are searched, all victims are located and removed, team integrity is maintained, and team members' safety — including respiratory protection — is not compromised.

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Requisite Knowledge: Use of forcible entry tools during rescue operations, ladder operations for rescue, psychological effects of operating in obscured conditions and ways to manage them, methods to determine if an area is tenable, primary and secondary search techniques, team members' roles and goals, methods to use and indicators of finding victims, victim removal methods (including various carries), and considerations related to respiratory protection.

1. Use of forcible entry tools during rescue operations
 - a. Striking
 - b. Prying
 - c. Cutting
 - d. Pulling
2. Ladder operations for rescue
 - a. Conscious victim
 - b. Unconscious victim
 - c. Firefighter rescue
3. Psychological effects of operating in obscured conditions and ways to manage them
4. Methods to determine if an area is tenable
 - a. Level of heat
 - b. Smoke
 - c. Structural stability
 - d. Risk/benefit analysis
5. Primary and secondary search techniques
 - a. Define the following
 - i. Primary search
 - ii. Secondary search
 - b. Search techniques
 - i. Right hand/left hand
 - ii. Large area/small area considerations
 - iii. Rope assisted, or hose line
 - iv. Tools
6. Team members' roles and goals
 - a. Finding victims
 - b. Obtaining information on the extent of the fire
 - c. Search priorities
 - i. Closest to fire area
 - ii. Remainder of fire floor

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- iii. Floor above
 - iv. Floor below
 - d. Rescue vs. recovery
7. Methods to use and indicators of finding victims
- a. Probable victim locations
 - i. Behind doors
 - ii. Under windows
 - iii. On/under beds
 - iv. In closets
 - v. In bathtubs
 - b. Additional considerations
 - i. Type of occupancy
 - ii. Time of day
 - iii. Building size and arrangement
 - iv. Information from neighbors
 - v. Occupant indicators
 - a) Vehicles in driveway
 - b) Toys in yard
 - c. Call out/listen
 - d. Victim sighting through opening (i.e. window/door)
8. Victim removal methods
- a. Types of carries
 - i. Extremity carry
 - ii. Seat carry
 - iii. Chair carry
 - iv. Webbing drag
 - v. Blanket drag
 - vi. Ladder rescue
 - a) Conscious
 - b) Unconscious
 - b. Securing of a victim
 - i. Basket
 - ii. Stretcher
 - iii. Long spine board
 - iv. Other devices
9. Considerations related to respiratory protection
- a. Personal use/work time
 - b. Emergency procedures
 - c. Rescue air/RIT pak
 - d. Conditions for use
 - i. Heat

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- ii. Smoke
- iii. Oxygen deficiency
- iv. Toxic atmospheres

Requisite Skills: The ability to use SCBA to exit through restricted passages, set up and use different types of ladders for various types of rescue operations, rescue a fire fighter with functioning respiratory protection, rescue a fire fighter whose respiratory protection is not functioning, rescue a person who has no respiratory protection, and assess areas to determine tenability.

101-5.3.10 Attack an interior structure fire operating as a member of a team, given an attack line, ladders when needed, personal protective equipment, tools, and an assignment, so that team integrity is maintained, the attack line is deployed for advancement, ladders are correctly placed when used, access is gained into the fire area, effective water application practices are used, the fire is approached correctly, attack techniques facilitate suppression given the level of the fire, hidden fires are located and controlled, the correct body posture is maintained, hazards are recognized and managed, and the fire is brought under control.

Requisite Knowledge: Principles of fire streams; types, design, operation, nozzle pressure effects, and flow capabilities of nozzles; precautions to be followed when advancing hose lines to a fire; observable results that a fire stream has been properly applied; dangerous building conditions created by fire; principles of exposure protection; potential long-term consequences of exposure to products of combustion; physical states of matter in which fuels are found; common types of accidents or injuries and their causes; and the application of each size and type of attack line, the role of the backup team in fire attack situations, attack and control techniques for grade level and above and below grade levels, and exposing hidden fires.

- 1. Principles of fire streams
 - a. Definitions
 - i. Pressure
 - ii. Friction loss
 - iii. Elevation loss/gain
 - iv. Fire stream
 - v. Vaporization
 - vi. Latent Heat Vaporization
 - vii. British Thermal Unit (BTU)
 - viii. Water Hammer
 - b. Fire Streams

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- i. Low-volume stream
- ii. Handline stream
- iii. Master stream
- iv. Cooling/extinguishing properties

2. Types of nozzles

- a. Solid stream
 - i. Types
 - ii. Advantages
 - iii. Disadvantages
 - iv. Flow rate
- b. Fog stream
 - i. Types
 - ii. Advantages
 - iii. Disadvantages
 - iv. Flow rate
 - v. Water flow adjustment
 - a) Manually Adjustable
 - b) Automatic (constant-pressure)
 - vi. Stream Patterns
 - a) Straight stream
 - b) Narrow fog
 - c) Wide fog
 - vii. Broken stream
 - a) Types
 - b) Advantages
 - c) Disadvantages
 - d) Flow rate
- c. Specialty nozzles
 - i. Types
 - ii. Advantages
 - iii. Disadvantages
 - iv. Flow rate

3. Design of nozzles

- a. Solid stream nozzle
 - i. Components/parts
 - ii. Operating pressure
 - a) 50 psi hand line
 - b) 80 psi master stream
- b. Fog stream nozzle
 - i. Components/parts
 - ii. Operating pressure
 - a) 100 psi hand line

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- b) 50-75 psi low pressure hand line
- c) 100 psi master stream
- c. Broken stream nozzle
 - i. Components/parts
 - ii. Operating pressure varies by design
- 4. Operation of nozzles
 - a. Operating valves
 - i. Ball valve
 - ii. Slide valve
 - iii. Rotary control valve
 - b. Flow selection
 - i. Automatic
 - ii. Adjustable
 - iii. Fixed
- 5. Nozzle pressure effects
 - a. Reach
 - i. Solid stream
 - ii. Fog stream
 - iii. Broken stream
 - b. Nozzle reaction
 - i. Solid stream
 - ii. Fog stream
 - iii. Broken stream
 - c. Water pattern
 - i. Solid stream
 - ii. Straight stream
 - iii. Narrow fog
 - iv. Wide fog
 - v. Broken stream
- 6. Flow capabilities of nozzles
 - a. Low volume nozzles – 40 GPM or less
 - b. Hand line nozzles – 40-350 GPM
 - c. Master stream nozzles – 350 GPM and above
- 7. Precautions to take when advancing hose lines to a fire
 - a. Into a structure
 - b. Up a stairway
 - c. Down a stairway
 - d. From a standpipe
 - e. Up a ladder

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8. Observable results that a fire stream has been properly applied
 - a. Direct attack
 - i. Smoke
 - ii. Heat
 - iii. Flame
 - b. Indirect attack
 - i. Smoke
 - ii. Heat
 - iii. Flame
 - iv. Patterns
 - a) T pattern
 - b) Z pattern
 - c) O pattern
 - c. Combination attack
 - i. Smoke
 - ii. Heat
 - iii. Flame
 - iv. Patterns
 - a) T pattern
 - b) Z pattern
 - c) O pattern
9. Dangerous building conditions created by fire
 - a. Flashover
 - b. Rollover
 - c. Backdraft
 - d. Smoke explosion
 - e. Imminent building collapse
 - f. Fire behind, below, or above attack team
 - g. Kinks or obstructions to the hose line
 - h. Holes, weak stairs, or other fall hazards
 - i. Suspended loads on fire-weakened supports
 - j. Hazardous or highly flammable commodities likely to spill
 - k. Electrical shock hazards
10. Principles of exposure protection
 - a. Conduction
 - b. Convection
 - c. Radiation
 - d. Direct flame impingement
11. Potential long-term consequences of exposure to products of combustion
 - a. Respiratory diseases

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- b. Cardiac diseases
 - c. Stroke
 - d. Cancer
 - e. Death
12. Physical states of matter in which fuels are found
- a. Solid
 - b. Liquid
 - c. Gaseous
13. Common types of accidents or injuries and their causes
- a. Common injuries
 - i. Sprains and strains
 - ii. Crushing injuries
 - iii. Cuts
 - iv. Overexertion
 - v. Exposure to heat or products of combustion
 - b. Common activities
 - i. During the response
 - ii. During fire attack
 - iii. Overhaul/continued scene operations
 - iv. Returning to service
 - v. Station activities
 - c. Common causes
 - i. Slips, trips, falls
 - ii. Failure to wear proper PPE
 - iii. Failure to follow safety procedures
14. Application of each size and type of attack line
- a. 30-350 GPM
 - b. 1 ½"-3" hose lines
 - c. AHJ
15. The role of the backup team in fire attack situations
- a. "Two-in/two-out" rule
 - b. Fire fighter rescue
 - c. AHJ
16. Attack and control techniques for grade level, above grade level and below grade level
- a. Grade level
 - i. Single story structures
 - ii. Large single story structures
 - b. Above grade level

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- i. Multi-story structures
- ii. Low-rise
- iii. Mid-rise
- iv. High-rise
- c. Below grade level
 - i. Basements
 - ii. Vaults

17. Exposing hidden fires

- a. Overhaul techniques
 - i. Opening walls
 - ii. Opening floors
 - iii. Opening ceilings
- b. Other concealed spaces - special considerations
 - i. Utility chutes/shafts
 - ii. Cocklofts
 - iii. Attics
 - iv. Basement
 - v. Other

Requisite Skills: The ability to prevent water hammers when shutting down nozzles; open, close, and adjust nozzle flow and patterns; apply water using direct, indirect, and combination attacks; advance charged and uncharged 38 mm (1½ in.) diameter or larger hose lines up ladders and up and down interior and exterior stairways; extend hose lines; replace burst hose sections; operate charged hose lines of 38 mm (1½ in.) diameter or larger while secured to a ground ladder; couple and uncouple various handline connections; carry hose; attack fires at grade level and above and below grade levels; and locate and suppress interior wall and subfloor fires.

- 101-5.3.11** Perform horizontal ventilation on a structure operating as part of a team, given an assignment, personal protective equipment, ventilation tools, equipment, and ladders, so that the ventilation openings are free of obstructions, tools are used as designed, ladders are correctly placed, ventilation devices are correctly placed, and the structure is cleared of smoke.

Requisite Knowledge: The principles, advantages, limitations, and effects of horizontal, mechanical, and hydraulic ventilation; safety considerations when venting a structure; fire behavior in a structure; the products of combustion found in a structure fire; the signs, causes, effects, and prevention of backdrafts; and the relationship of oxygen concentration to life safety and fire growth.

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1. Principles, advantages, limitations & effects of horizontal, mechanical and hydraulic ventilation
 - a. Purposes
 - i. Life safety
 - ii. Fire attack and extinguishment
 - iii. Fire spread control
 - iv. Reduce flashover potential
 - v. Reduce backdraft potential
 - vi. Property conservation
 - b. Types of horizontal ventilation
 - i. Natural
 - ii. Mechanical
 - a) Positive pressure
 - b) Negative pressure
 - c) Hydraulic
 - c. Advantages
 - i. Natural
 - ii. Mechanical
 - a) Positive pressure
 - b) Negative pressure
 - c) Hydraulic
 - d. Limitations
 - i. Natural
 - ii. Mechanical
 - a) Positive pressure
 - b) Negative pressure
 - c) Hydraulic
 - e. Effects
 - i. Natural
 - ii. Mechanical
 - a) Positive pressure
 - b) Negative pressure
 - c) Hydraulic
2. Safety considerations when venting a structure
 - a. Life safety hazards
 - b. Determining the location and extent of the fire
 - c. Identifying building construction features
 - d. Predicting fire travel and growth
3. Fire behavior in a structure
 - a. Products of combustion
 - b. Behavior of heat, smoke and fire gases

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- c. Airflow characteristics
- 4. Products of combustion found in a structure fire
 - a. Heat
 - b. Smoke
 - c. Gases and irritants
- 5. Backdrafts
 - a. Signs
 - b. Causes
 - c. Effects
 - d. Prevention
- 6. Relationship of oxygen concentration to life safety and fire growth.

Requisite Skills: The ability to transport and operate ventilation tools and equipment and ladders, and to use safe procedures for breaking window and door glass and removing obstructions.

- 101-5.3.12** Perform vertical ventilation on a structure as part of a team, given an assignment, personal protective equipment, ground and roof ladders, and tools, so that ladders are positioned for ventilation, a specified opening is created, all ventilation barriers are removed, structural integrity is not compromised, products of combustion are released from the structure, and the team retreats from the area when ventilation is accomplished.

Requisite Knowledge: The methods of heat transfer; the principles of thermal layering within a structure on fire; the techniques and safety precautions for venting flat roofs, pitched roofs, and basements; basic indicators of potential collapse or roof failure; the effects of construction type and elapsed time under fire conditions on structural integrity; and the advantages and disadvantages of vertical and trench/strip ventilation.

- 1. Methods of heat transfer
 - a. Conduction
 - b. Convection
 - c. Radiation
 - d. Direct flame impingement
- 2. Principles of thermal layering within a structure on fire
 - a. Definition of thermal layering (i.e., heat stratification, thermal balance)
 - b. Thermal layering as it relates to ventilation
 - c. Thermal layering in relation to life safety/rescue

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3. Techniques and safety precautions for venting flat roofs
 - a. Weather conditions
 - b. Determining need
 - c. Exposures
 - d. Obstructions/weight on roof
 - e. Maintain structural support integrity during cut
 - f. PPE
 - g. Tools
 - h. Ladder placement
 - i. Sounding roof
 - j. Slips, trips, and falls
 - k. Reduced visibility
 - l. Equipment safety
 - m. Location of vent cut
 - n. Secondary means of escape
 - o. Personnel
 - p. Types of cuts

4. Techniques and safety precautions for venting pitched roofs
 - a. Styles of roofs
 - i. Hip
 - ii. Gable
 - iii. Mansard
 - iv. Shed
 - v. Butterfly
 - vi. Gambrel
 - b. Weather conditions
 - c. Determining need
 - d. Exposures
 - e. Obstructions/weight on roof
 - f. Maintain structural support integrity during cut
 - g. PPE
 - h. Tools
 - i. Ladder placement
 - j. Sounding roof
 - k. Slips, trips, and falls
 - l. Reduced visibility
 - m. Equipment safety
 - n. Location of vent cut
 - o. Secondary means of escape
 - p. Personnel
 - q. Types of cuts

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5. Techniques and safety precautions for venting basements
 - a. Determining need
 - b. Exposures
 - c. Obstructions/weight on floor above
 - d. Maintain structural support integrity during cut
 - e. PPE
 - f. Tools
 - g. Slips, trips, and falls
 - h. Reduced visibility
 - i. Equipment safety
 - j. Location of ventilation openings
 - k. Personnel

6. Basic indicators of potential collapse or roof failure
 - a. Construction
 - i. Solid beam
 - ii. Light weight trusses
 - b. Size up
 - i. Sagging roof
 - ii. Spongy roof
 - iii. Melting tar
 - iv. Smoke seepage
 - v. Visible fire
 - c. Elapsed time of fire

7. Effects of construction type
 - a. Structural integrity
 - b. Fire spread

8. Elapsed time under fire conditions on structural integrity

9. Vertical ventilation
 - a. Advantages
 - b. Disadvantages

10. Trench/strip ventilation
 - a. Advantages
 - b. Disadvantages

Requisite Skills: The ability to transport and operate ventilation tools and equipment; hoist ventilation tools to a roof; cut roofing and flooring materials to vent flat roofs, pitched roofs, and basements; sound a roof for integrity; clear an opening with hand tools; select, carry, deploy, and secure ground ladders for ventilation activities; deploy roof ladders on

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pitched roofs while secured to a ground ladder; and carry ventilation-related tools and equipment while ascending and descending ladders.

- 101-5.3.13** Overhaul a fire scene, given personal protective equipment, attack line, hand tools, a flashlight, and an assignment, so that structural integrity is not compromised, all hidden fires are discovered, fire cause evidence is preserved, and the fire is extinguished.

Requisite Knowledge: Types of fire attack lines and water application devices most effective for overhaul, water application methods for extinguishment that limit water damage, types of tools and methods used to expose hidden fire, dangers associated with overhaul, obvious signs of area of origin or signs of arson, and reasons for protection of fire scene.

1. Types of fire attack lines and water application devices most effective for overhaul
 - a. Attack lines
 - b. Fire extinguishers
 - c. Buckets and basins
 - d. SOPs per AHJ
2. Water application methods for extinguishment that limit water damage
 - a. Water conservation
 - b. Soaking in buckets and basins
3. Types of tools to expose hidden fire
 - a. Prying and pulling tools
 - b. Cutting tools
 - c. Striking tools
 - d. Power tools
 - e. Thermal imaging camera
4. Methods to expose hidden fires
 - a. Sight
 - b. Touch
 - c. Sound
 - d. Electronic instruments
5. Dangers associated with overhaul
 - a. Toxic atmospheric conditions
 - b. Weakened floors and structural members
 - c. Sharp objects and debris
 - d. Utilities
 - e. Slippery surfaces

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6. Obvious signs of area of origin or signs of arson
 - a. Burn patterns
 - b. Smoke markings
 - c. Physical evidence
7. Reasons for protection of fire scene
 - a. Securing the scene
 - b. Preservation of evidence

Requisite Skills: The ability to deploy and operate an attack line; remove flooring, ceiling, and wall components to expose void spaces without compromising structural integrity; apply water for maximum effectiveness; expose and extinguish hidden fires in walls, ceilings, and subfloor spaces; recognize and preserve obvious signs of area of origin and arson; and evaluate for complete extinguishment.

- 101-5.3.14** Conserve property as a member of a team, given salvage tools and equipment and an assignment, so that the building and its contents are protected from further damage.

Requisite Knowledge: The purpose of property conservation and its value to the public, methods used to protect property, types of and uses for salvage covers, operations at properties protected with automatic sprinklers, how to stop the flow of water from an automatic sprinkler head, identification of the main control valve on an automatic sprinkler system, and forcible entry issues related to salvage.

1. The purpose of property conservation and its value to the public
2. Methods used to protect property
 - a. Removal of property
 - b. Protection of property in place
3. Types and uses of salvage covers
 - a. Types
 - i. Canvas
 - ii. Synthetic
 - a) Vinyl
 - b) Plastic
 - b. Uses
 - i. Cover property
 - ii. Construct basins, chutes and catchalls
 - iii. Floor runners

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- iv. Debris removal
- 4. Operations at properties protected with automatic sprinklers
- 5. How to stop the flow of water from an automatic sprinkler head
 - a. Sprinkler stops and wedges
 - b. Operate main control valves
- 6. Identification of the main control valve on an automatic sprinkler system
 - a. Sprinkler riser
 - b. Indicating valves
 - i. Outside stem and yoke (OS & Y)
 - ii. Butterfly Valve
 - iii. Wall Post Indicator Valve (WPIV)
 - iv. Post Indicator Valve (PIV)
 - v. Post Indicator Valve Assembly (PIVA)
- 7. Forcible entry issues related to salvage
 - a. Utilize forcible entry only when necessary
 - b. Try before you pry

Requisite Skills: The ability to cluster furniture; deploy covering materials; roll and fold salvage covers for reuse; construct water chutes and catch-alls; remove water; cover building openings, including doors, windows, floor openings, and roof openings; separate, remove, and relocate charred material to a safe location while protecting the area of origin for cause determination; stop the flow of water from a sprinkler with sprinkler wedges or stoppers; and operate a main control valve on an automatic sprinkler system.

- 101-5.3.15** Connect a fire department pumper to a water supply as a member of a team, given supply or intake hose, hose tools, and a fire hydrant or static water source, so that connections are tight and water flow is unobstructed.

Requisite Knowledge: Loading and off-loading procedures for mobile water supply apparatus; fire hydrant operation; and suitable static water supply sources, procedures, and protocol for connecting to various water sources.

- 1. Loading and off-loading procedures for mobile water supply apparatus (AHJ)
 - a. Portable water tanks
 - b. Drafting and siphoning appliances

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- c. Relay pumping apparatus
 - d. Fill apparatus and drafting appliances
 - e. Portable pumps
 - f. Fire hydrant appliances
 - g. Dry hydrants or suction supply points
2. Fire hydrant operation
- a. Types
 - i. Dry barrel hydrant
 - ii. Wet barrel hydrant
 - b. Color coding
 - i. Class AA Light blue
 - ii. Class A Green
 - iii. Class B Orange
 - iv. Class C Red
3. Suitable static water supply sources
- a. Lakes
 - b. Rivers
 - c. Streams
 - d. Ponds
 - e. Pools
4. Procedures protocol for connecting to various water sources
- a. Hydrant to pumper connection
 - i. Forward hose lay
 - ii. Reverse hose lay
 - b. Drafting

Requisite Skills: The ability to hand lay a supply hose, connect and place hard suction hose for drafting operations, deploy portable water tanks as well as the equipment necessary to transfer water between and draft from them, make hydrant-to-pumper hose connections for forward and reverse lays, connect supply hose to a hydrant, and fully open and close the hydrant.

- 101-5.3.16** Extinguish incipient Class A, Class B, and Class C fires, given a selection of portable fire extinguishers, so that the correct extinguisher is chosen, the fire is completely extinguished, and correct extinguisher-handling techniques are followed.

Requisite Knowledge: The classifications of fire; the types of, rating systems for, and risks associated with each class of fire; and the operating methods of and limitations of portable extinguishers.

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1. Classifications of fire
 - a. Class A – ordinary combustible materials
 - b. Class B – flammable and/or combustible liquids and gases
 - c. Class C – energized electrical equipment
 - d. Class D – combustible metals
 - e. Class K – combustible cooking oils

2. Types of fire
 - a. Combustible materials
 - b. Flammable liquids and gases
 - c. Energized electrical equipment
 - d. Combustible metals
 - e. Combustible cooking oils

3. Rating systems for fire
 - a. Class A test
 - i. Wood panel
 - ii. Wood crib
 - b. Class B test
 - i. Pan of flammable liquid
 - ii. n-heptane used
 - c. Class C test
 - i. Applies to energized electrical fires only
 - ii. De-energized equipment is treated as a class A, B or D fire
 - d. Class D test
 - i. Metal fires only
 - ii. Dry powder agent must be formulated to the specific metal
 - e. Class K test
 - i. Cooking oil fires
 - ii. Uses a specialized extinguishing agent

4. Operating methods of portable extinguishers
 - a. Acronym PASS
 - i. Pull
 - ii. Aim
 - iii. Squeeze
 - iv. Sweep
 - b. Distance from the fire

5. Limitations of portable extinguishers
 - a. Type of agent for fire

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b. Size of extinguisher for fire

Requisite Skills: The ability to operate portable fire extinguishers, approach fire with portable fire extinguishers, select an appropriate extinguisher based on the size and type of fire, and safely carry portable fire extinguishers.

101-5.3.17 Illuminate the emergency scene, given fire service electrical equipment and an assignment, so that designated areas are illuminated and all equipment is operated within the manufacturer’s listed safety precautions.

Requisite Knowledge: Safety principles and practices, power supply capacity and limitations, and light deployment methods.

1. Safety principles and practices
 - a. Safely lifts equipment during set up
 - b. Locates the power plant in a remote and well ventilated position
 - c. Arranges power cords neatly to minimize tripping hazards
 - d. Ground Fault Interrupters (GFI) operations
2. Power supply capacity and limitations
 - a. Power supply (portable or mounted)
 - b. Lights
 - c. Auxiliary equipment
 - d. Cords
 - e. Connectors
3. Light deployment methods
 - a. Organizes lights to illuminate area sufficiently
 - b. Follow equipment operating guidelines

Requisite Skills: The ability to operate department power supply and lighting equipment, deploy cords and connectors, reset ground-fault interrupter (GFI) devices, and locate lights for best effect.

101-5.3.18 Turn off building utilities, given tools and an assignment, so that the assignment is safely completed.

Requisite Knowledge: Properties, principles, and safety concerns for electricity, gas, and water systems; utility disconnect methods and associated dangers; and use of required safety equipment.

1. Electrical systems

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- a. Properties
 - b. Principles
 - c. Safety concerns
2. Gas systems
 - a. Properties
 - b. Principles
 - c. Safety concerns
 3. Water systems
 - a. Properties
 - b. Principles
 - c. Safety concerns
 4. Utility disconnect methods
 - a. Electrical
 - i. Electric meter
 - ii. Main breaker box
 - b. Natural gas meter
 - c. Water meter
 5. Dangers associated with utility disconnect methods
 - a. Electrocution
 - b. Fire/explosion
 6. Use of required safety equipment (AHJ)

Requisite Skills: The ability to identify utility control devices, operate control valves or switches, and assess for related hazards.

- 101-5.3.19** Combat a ground cover fire operating as a member of a team, given protective clothing, SCBA if needed, hose lines, extinguishers or hand tools, and an assignment, so that threats to property are reported, threats to personal safety are recognized, retreat is quickly accomplished when warranted, and the assignment is completed.

Requisite Knowledge: Types of ground cover fires, parts of ground cover fires, methods to contain or suppress, and safety principles and practices.

1. Types of ground cover fires
 - a. Crown fire – aerial fuel
 - b. Surface fire – surface fuel
 - c. Subsurface fire – subsurface fuel

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2. Parts of ground cover fires
 - a. Head
 - b. Origin
 - c. Heel
 - d. Flanks
 - e. Fingers
 - f. Spot fires
 - g. Island
 - h. Perimeter
 - i. Green
 - j. Black
3. Methods to contain or suppress
 - a. Direct attack
 - b. Indirect attack
4. Safety principles and practices
 - a. Proper use of PPE
 - b. Proper use of tools
 - c. Scene hazard awareness
5. Factors influencing the spread of ground fires
 - a. Weather
 - b. Topography
 - c. Fuel

Requisite Skills: The ability to determine exposure threats based on fire spread potential, protect exposures, construct a fire line or extinguish with hand tools, maintain integrity of established fire lines, and suppress ground cover fires using water.

101-5.4 **Rescue Operations**

This duty shall involve no requirements for Fire Fighter I.

101-5.5 **Prevention, Preparedness, and Maintenance**

This duty shall involve performing activities that reduce the loss of life and property due to fire through response readiness, according to the JPRs in 5.5.1 and 5.5.2.

- 101-5.5.1** Clean and check ladders, ventilation equipment, SCBA, ropes, salvage equipment, and hand tools, given cleaning tools, cleaning supplies, and an assignment, so that equipment is clean and maintained according to

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manufacturer's or departmental guidelines, maintenance is recorded, and equipment is placed in a ready state or reported otherwise.

Requisite Knowledge: Types of cleaning methods for various tools and equipment, correct use of cleaning solvents, and manufacturer's or departmental guidelines for cleaning equipment and tools.

1. Types of cleaning methods for various tools and equipment
 - a. Ladders
 - b. Ventilation equipment
 - c. SCBA
 - d. Ropes
 - e. Salvage equipment
 - f. Hand tools
2. Correct use of cleaning solvents
 - a. Mild diluted detergent
 - b. Safety solvent
 - c. Water
3. Manufacturer's or departmental guidelines for cleaning equipment and tools (AHJ)

Requisite Skills: The ability to select correct tools for various parts and pieces of equipment, follow guidelines, and complete recording and reporting procedures.

- 101-5.5.2** Clean, inspect, and return fire hose to service, given washing equipment, water, detergent, tools, and replacement gaskets, so that damage is noted and corrected, the hose is clean, and the equipment is placed in a ready state for service.

Requisite Knowledge: Departmental procedures for noting a defective hose and removing it from service, cleaning methods, and hose rolls and loads.

1. Departmental procedures for noting a defective hose and removing it from service (AHJ)
2. Cleaning methods
 - a. Rinse
 - b. Gently scrub with mild detergent
 - c. Final rinse

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3. Hose rolls
 - a. Straight roll
 - b. Donut roll
 - c. Twin donut roll
 - d. Self-locking twin donut roll

4. Hose loads
 - a. Forward lay
 - b. Reverse lay
 - c. Accordion load
 - d. Horseshoe load
 - e. Reverse horseshoe load
 - f. Flat load
 - g. Triple layer load
 - h. Minuteman load
 - i. Booster hose load (reel)

Requisite Skills: The ability to clean different types of hose, operate hose washing and drying equipment, mark defective hose, and replace coupling gaskets, roll hose, and reload hose.

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SECTION 102
BASIC FIRE SUPPRESSION – FIREFIGHTER II

A Basic Structure Fire Protection Personnel is a Fire Fighter who has met all the job performance requirements of Fire Fighter I and Fire Fighter II as defined in NFPA 1001 *Standard for Fire Fighter Professional Qualifications*. In order to satisfactorily meet these requirements, the Fire Fighter trainee must meet all the job performance requirements (JPRs) and demonstrate mastery of all the knowledge, skills, and ability requirements of the following components of the Texas Commission on Fire Protection Certification Curriculum Manual:

- Chapter 1, Section 101 - 5 Basic Fire Suppression - Firefighter I
- Chapter 1, Section 102 - 6 Basic Fire Suppression - Firefighter II
- Chapter 6, Section 601 - 4 Hazardous Materials Awareness
- Chapter 6, Section 602 - 5 Hazardous Materials Operations
- Chapter 6, Section 603 - 6.2 Hazardous Materials Operations - Mission Specific Competencies - Using Personal Protective Equipment
- Chapter 6, Section 603 - 6.6 Hazardous Materials Operations - Mission Specific Competencies - Product Control

102-6.1 **General**

102-6.1.1 **General Knowledge Requirements**

Responsibilities of the Fire Fighter II in assuming and transferring command within an incident management system, performing assigned duties in conformance with applicable NFPA and other safety regulations and authority having jurisdiction (AHJ) procedures, and the role of a Fire Fighter II within the organization.

1. Identify and describe the purpose of an Incident Management System
 - a. Common terminology
 - b. Modular organization
 - c. Integrated communications
 - d. Unified command structure
 - e. Consolidated action plans
 - f. Manageable span of control
 - g. Predesignated incident facilities
 - h. Comprehensive resource management

2. Functions necessary to manage an incident effectively and the responsibilities within the Incident Management System
 - a. Command
 - b. Safety
 - c. Liaison

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- d. Information
 - e. Operations
 - f. Planning
 - g. Logistics
 - h. Finance/Administration
3. Components and functions of the operations section within the Incident Management System
- a. Incident Command
 - b. Staging
 - c. Branches
 - d. Divisions and Groups
 - e. Strike Teams and Task Forces
 - f. Single Resources
4. Procedure for implementing the Incident Management System
- a. Hazard and risk analysis
 - i. What has occurred?
 - ii. What is the current status of the emergency?
 - iii. Is anyone trapped or injured?
 - iv. Can the emergency be handled with the resources on scene or en route?
 - v. Does the emergency fall within the scope of the individual's training?
 - b. Risk vs. benefit
5. Establishing command and the transfer of command
- a. First on scene
 - i. Investigation
 - ii. Command
 - iii. Pass command for fast attack/rescue
 - b. Considerations for transfer of command
 - i. Arrival of senior staff
 - ii. Specialized incident
 - iii. Resource requirements
 - iv. Time restraints
 - v. Demobilization
 - c. Methods of transferring command
 - i. Face-to-face
 - ii. Via radio
6. Transferring command
- a. Situation status report (Sit Stat)
 - b. Communicating transfer of command

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102-6.1.2 General Skill Requirements

The ability to determine the need for command, organize and coordinate an incident management system until command is transferred, and function within an assigned role in an incident management system.

102-6.2 Fire Department Communications

This duty shall involve performing activities related to initiating and reporting responses, according to the JPRs in 6.2.1 and 6.2.2.

102-6.2.1 Complete a basic incident report, given the report forms, guidelines, and information, so that all pertinent information is recorded, the information is accurate, and the report is complete.

Requisite Knowledge: Content requirements for basic incident reports, the purpose and usefulness of accurate reports, consequences of inaccurate reports, how to obtain necessary information, and required coding procedures.

1. Content requirements for basic incident reports
 - a. National Fire Incident Reporting System (NFIRS)
 - b. Texas Fire Incident Reporting System (TXFIRS)
2. Purpose of accurate reports
 - a. A legal record of an incident
 - b. Consistent format for the collection of data usable at the state and national level
3. Usefulness of accurate reports
 - a. Provides information to officials for evaluating performance and making changes
 - b. Aids in determining departmental needs
4. Consequences of inaccurate reports
 - a. Incorrect data
 - b. Litigation
5. How to obtain necessary information
 - a. Person or entity involved
 - b. Owner
 - c. Bystanders or eye witnesses
 - d. Dispatch
 - e. Equipment involved in ignition
 - f. Fire fighters on scene

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6. Required coding procedures
 - a. NFIRS
 - b. TXFIRS

Requisite Skills: The ability to determine necessary codes, proof reports, and operate fire department computers or other equipment necessary to complete reports.

- 102-6.2.2** Communicate the need for team assistance, given fire department communications equipment, SOPs, and a team, so that the supervisor is consistently informed of team needs, departmental SOPs are followed, and the assignment is accomplished safely.

Requisite Knowledge: SOPs for alarm assignments and fire department radio communication procedures. (AHJ)

1. Alarm assignment SOP
2. Fire department radio communication procedures

Requisite Skills: The ability to operate fire department communications equipment.

102-6.3 **Fireground Operations**

This duty shall involve performing activities necessary to ensure life safety, fire control, and property conservation, according to the JPRs in 6.3.1 through 6.3.4.

- 102-6.3.1** Extinguish an ignitable liquid fire, operating as a member of a team, given an assignment, an attack line, personal protective equipment, a foam proportioning device, a nozzle, foam concentrates, and a water supply, so that the correct type of foam concentrate is selected for the given fuel and conditions, a properly proportioned foam stream is applied to the surface of the fuel to create and maintain a foam blanket, fire is extinguished, reignition is prevented, team protection is maintained with a foam stream, and the hazard is faced until retreat to safe haven is reached.

Requisite Knowledge: Methods by which foam prevents or controls a hazard; principles by which foam is generated; causes for poor foam generation and corrective measures; difference between hydrocarbon and polar solvent fuels and the concentrates that work on each; the characteristics, uses, and limitations of fire-fighting foams; the advantages and disadvantages of using fog nozzles versus foam nozzles for foam

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application; foam stream application techniques; hazards associated with foam usage; and methods to reduce or avoid hazards.

1. Methods by which foam prevents a hazard
 - a. Blanketing effect
 - b. Vapor suppression

2. Methods by which foam controls a hazard
 - a. Heat resistance
 - b. Fuel resistance
 - c. Vapor suppression

3. Principles by which foam is generated
 - a. Components of finished foam
 - i. Foam solution
 - a) Foam concentrate
 - b) Water
 - ii. Air (aeration/mechanical agitation at the nozzle)
 - b. Water + concentrate = foam solution
 - c. Foam solution + air = finished foam

4. Methods by which foam is generated
 - a. Foam eductor
 - i. Venturi principle
 - ii. In-line eductor
 - iii. Bypass eductor
 - b. Around the pump foam proportioner
 - c. Balanced pressure foam system
 - d. Premix

5. Cause for poor foam generation
 - a. Foam concentrate/fuel type mismatch
 - b. Fuel area and depth
 - c. Wrong application rate
 - d. Inadequate water supply, or pressure
 - e. Foam educator type and setting
 - f. Nozzle type and setting
 - g. Back pressure

6. Corrective measures for poor foam generation
 - a. Identify fuel type
 - i. Hydrocarbon
 - ii. Polar solvent
 - b. Determine fuel depth and surface area

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- c. Determine application rate (GPM/ft²)
 - d. Acquire adequate supply of foam concentrate
 - e. Establish water supply, and correct pressure
 - f. Verify proper eductor operation
 - i. Setting (i.e., 1%, 3%, 6%)
 - ii. Concentrate pick-up tube
 - g. Nozzle flow matches eductor capability (GPM) and provides aeration
 - h. Check for hose kinks, blockage
 - i. Assure nozzle is fully open
7. Differentiating between hydrocarbon and polar solvent fuels
- a. Hydrocarbon fuels
 - i. Examples
 - ii. Concentrate types
 - iii. Concentrate percentage and application rate
 - b. Polar solvent fuels
 - i. Examples
 - ii. Concentrate types
 - iii. Concentrate percentage and application rate
8. Advantages, uses and limitations of fire-fighting foams
- a. Protein
 - i. High water retention and heat resistance
 - ii. Effective vapor suppression
 - iii. Limited shelf life
 - iv. Poor fuel resistance
 - v. Slow knockdown
 - vi. Poor compatibility with dry chemical agents
 - b. Fluoroprotein
 - i. Excellent fuel resistance
 - ii. Compatible with specific dry chemical agents
 - iii. High heat resistance
 - iv. Requires use of foam nozzle
 - c. Film forming fluoroprotein (FFFP)
 - i. Fast film-forming capability
 - ii. High heat resistance
 - d. Aqueous film forming foam (AFFF)/alcohol type concentrate (ATC)
 - i. Fast film-forming capability
 - ii. Applied with regular fog nozzles
 - iii. Compatible with specific dry chemical agents
 - iv. ATC suitable for polar solvent fuel fires
 - v. Quick drain-down may require continued application

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- e. High-expansion foam
 - i. Reduces surface tension of water
 - ii. Excellent penetration into Class A materials
 - iii. Poor heat resistance
 - f. Class A foams
 - i. Reduces surface tension of water
 - ii. Foamy water solution clings to surfaces
 - iii. Fast extinguishment
 - iv. Requires a more accurate proportioning system
 - v. Impacts fire investigation laboratory tests
 - vi. Creates difficult salvage operations
9. Advantages and disadvantages of using fog nozzles
- a. Suitable for use with AFFF and Class A foams
 - b. Not suitable for use with protein and fluoroprotein foams
 - c. Use of expansion tubes
 - d. Reduced reach when flowing foam
10. Advantages and disadvantages of using foam nozzles
- a. Creates highest quality of foam
 - b. Must be used with protein and fluoroprotein foam
 - c. Stream reach less than a standard fog nozzle
11. Foam stream application techniques
- a. Roll-on technique
 - b. Bank-down technique
 - c. Rain-down technique
12. Hazards associated with foam usage
- a. Mildly irritating
 - b. Mildly corrosive
 - c. Environmental impact
 - d. Limited foam stream reach
13. Methods to reduce or avoid hazards
- a. Flush affected areas with water
 - b. Control run-off
 - c. Additional exposure lines for personnel protection

Requisite Skills: The ability to prepare a foam concentrate supply for use, assemble foam stream components, master various foam application techniques, and approach and retreat from spills as part of a coordinated team.

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102-6.3.2 Coordinate an interior attack line for a team's accomplishment of an assignment in a structure fire, given attack lines, personnel, personal protective equipment, and tools, so that crew integrity is established; attack techniques are selected for the given level of the fire (e.g., attic, grade level, upper levels, or basement); attack techniques are communicated to the attack teams; constant team coordination is maintained; fire growth and development is continuously evaluated; search, rescue, and ventilation requirements are communicated or managed; hazards are reported to the attack teams; and incident command is apprised of changing conditions.

Requisite Knowledge: Selection of the nozzle and hose for fire attack, given different fire situations; selection of adapters and appliances to be used for specific fireground situations; dangerous building conditions created by fire and fire suppression activities; indicators of building collapse; the effects of fire and fire suppression activities on wood, masonry (brick, block, stone), cast iron, steel, reinforced concrete, gypsum wallboard, glass, and plaster on lath; search and rescue and ventilation procedures; indicators of structural instability; suppression approaches and practices for various types of structural fires; and the association between specific tools and special forcible entry needs.

1. Selection of the nozzle for fire attack
 - a. Handlines
 - i. Fog nozzles
 - ii. Solid stream
 - iii. Broken stream
 - b. Master streams
 - i. Fog nozzles
 - ii. Solid stream
2. Selection of the hose for fire attack
 - a. Small diameter ($\frac{3}{4}$ ", 1", 1 $\frac{1}{2}$ ", 1 $\frac{3}{4}$ ", 2") handlines
 - b. Medium diameter (2 $\frac{1}{2}$ ", 3") handlines
 - c. Medium (2 $\frac{1}{2}$ ", 3") or large diameter hose (3 $\frac{1}{2}$ ", 4", 5", 6") for master stream support
3. Selection of adapters and appliances to be used for specific fire ground situations
 - a. Wyes – gated and non-gated
 - b. Siamese – clapper and non-clapper
 - c. Water thief
 - d. Manifold (portable hydrant)
 - e. Hydrant valve

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- f. Double male
 - g. Double female
 - h. Reducers
 - i. Adapters
 - i. Adapts one thread type to another
 - ii. Adapts threaded couplings to sexless couplings
4. Dangerous building conditions created by fire and fire suppression activities
- a. Conditions that contribute to the spread and intensity of the fire
 - i. Fire loading
 - ii. Combustible furnishings and finishes
 - iii. Roof coverings
 - iv. Wooden floors and ceilings
 - v. Large, open spaces
 - b. Conditions that make the building susceptible to collapse
 - i. Damage to structural system of the building from fire or firefighting activities
 - ii. Age of the building
 - iii. Lightweight or truss construction
 - iv. Older buildings exposed to weather
 - v. Firefighting operations
 - a) Improper vertical ventilation
 - b) Added weight of water used for fire extinguishment
5. Indicators of building collapse
- a. Deterioration of mortar joints
 - b. Overall age and condition of the building
 - c. Cracks in walls, floors, ceilings, and roofs
 - d. Signs of building repair (tie rods and stars)
 - e. Large open spans
 - f. Bulges, bowing and leaning of walls
 - g. Sagging floors
 - h. Abandoned buildings
 - i. Large volume of fire
 - j. Extended firefighting operations
 - k. Smoke coming from cracks in walls
 - l. Dark smoke from truss roof or floor spaces
 - m. Multiple fires in same building or damage from previous fires
6. Effects of fire suppression activities on
- a. Wood
 - b. Masonry (brick, block, stone)

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- c. Cast iron
 - d. Steel
 - e. Reinforced concrete
 - f. Gypsum wallboard
 - g. Glass
 - h. Plaster on lath
7. Search and rescue procedures
- a. Define the following
 - i. Primary search
 - ii. Secondary search
 - b. Search techniques
 - i. Right hand/left hand
 - ii. Large area/small area considerations
 - iii. Rope assisted, or hose line
 - iv. Use of tools
 - a) To extend reach
 - b) Door chocks or door/latch straps
 - c) Thermal Imaging Cameras
 - v. Vent Enter Search (VES)
 - vi. Communication during search
 - vii. Search marking systems
8. Ventilation procedures
- a. Types
 - i. Natural
 - ii. Mechanical
 - a) Positive pressure
 - b) Negative pressure
 - c) Hydraulic
 - b. Techniques
 - i. Horizontal
 - ii. Vertical
 - c. Coordinate with fire attack
 - d. Special considerations
 - i. Concrete roofs
 - ii. Metal roofs
 - iii. Ventilating basements
 - iv. Ventilating high-rises
 - v. Ventilating windowless buildings
 - vi. Ventilating large buildings
9. Indicators of structural instability
- a. Truss

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- b. Lightweight construction
 - c. Cracks or separations in walls, floors, ceilings and roof structures
 - d. Presence of tie rods and stars
 - e. Loose bricks, blocks, or stones falling from buildings
 - f. Deteriorated mortar joints
 - g. Walls that appear to be leaning
 - h. Structural members that appear to be distorted
10. Suppression approaches for various types of structural fires
- a. Offensive
 - b. Defensive
 - c. Occupancy
 - i. Single-family dwellings
 - ii. Multi-family dwellings
 - iii. Commercial occupancies
 - iv. High-rises
11. Suppression practices for various types of structural fires
- a. Residential fires
 - i. Attic
 - ii. Grade-level
 - iii. Upper-level
 - iv. Basement
 - v. Concealed spaces
 - b. Small business fires
 - i. Attic
 - ii. Grade-level
 - iii. Upper-level
 - iv. Basement
 - v. Concealed spaces
12. Association between specific tools and special forcible entry needs
- a. Hand tools
 - i. Pry axe
 - ii. Detroit door opener
 - b. Power tools
 - i. Chain saw
 - ii. Circular saw
 - iii. Reciprocating saw
 - iv. Drill
 - c. Lock tools
 - i. "A" tool
 - ii. "K" tool

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- iii. “J” tool
- iv. Shove knife
- v. Duck bill lock breaker
- vi. Locking pliers and chain
- vii. Bam bam tool
- viii. Elevator keys
- d. Hydraulic/pneumatic tools
 - i. Rabbet tool
 - ii. Hydraulic spreaders
 - iii. Hydraulic rams
 - iv. Hydraulic cutters
 - v. Pneumatic spreaders
 - vi. Pneumatic cutters
 - vii. Pneumatic drills and saws

Requisite Skills: The ability to assemble a team, choose attack techniques for various levels of a fire (e.g., attic, grade level, upper levels, or basement), evaluate and forecast a fire’s growth and development, select tools for forcible entry, incorporate search and rescue procedures and ventilation procedures in the completion of the attack team efforts, and determine developing hazardous building or fire conditions.

- 102-6.3.3** Control a flammable gas cylinder fire, operating as a member of a team, given an assignment, a cylinder outside of a structure, an attack line, personal protective equipment, and tools, so that crew integrity is maintained, contents are identified, safe havens are identified prior to advancing, open valves are closed, flames are not extinguished unless the leaking gas is eliminated, the cylinder is cooled, cylinder integrity is evaluated, hazardous conditions are recognized and acted upon, and the cylinder is faced during approach and retreat.

Requisite Knowledge: Characteristics of pressurized flammable gases, elements of a gas cylinder, effects of heat and pressure on closed cylinders, boiling liquid expanding vapor explosion (BLEVE) signs and effects, methods for identifying contents, how to identify safe havens before approaching flammable gas cylinder fires, water stream usage and demands for pressurized cylinder fires, what to do if the fire is prematurely extinguished, valve types and their operation, alternative actions related to various hazards, and when to retreat.

- 1. Characteristics of pressurized flammable gases
 - a. Pressure
 - b. Vapor pressure
 - c. Vapor density

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- d. Expansion ratio
2. Elements of a gas cylinder
 - a. Cylinder design
 - b. Cylinder valves
 - c. Pressure relief valves
 - d. Test limits
3. Effects of heat on closed cylinders
 - a. Increase in pressure
 - b. Thermal damage
 - c. Container failure
4. Effects of pressure on closed cylinders
 - a. Expansion of cylinder
 - b. Pressure relief valves
 - c. Container failure
5. Boiling liquid expanding vapor explosion (BLEVE) signs
 - a. Pinging sound of pressure-stretched metal
 - b. Discoloration of metal shell
 - c. Bulge or bubble in metal shell
 - d. Activation of pressure relief valve
 - e. Failure of pressure relief valve
 - f. Increase in intensity of pressure relief valve (torch)
6. Boiling liquid expanding vapor explosion (BLEVE) effects
 - a. Container failure
 - b. Violent explosion with fragmentation
 - c. Rapid expansion of gases
 - d. Huge fireball
 - e. Radiant heat
 - f. Flying container fragments
7. Methods for identifying contents
 - a. Placards
 - b. Labels
 - c. Shipping papers
 - d. Facility documents
8. How to identify safe havens before approaching flammable gas cylinder fires
 - a. Perform scene size up
 - i. Note position and condition of container

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- ii. Analyze terrain
 - iii. Identify possible safe havens
 - b. Do not approach container from the ends
- 9. Water stream usage for pressurized cylinder fires
 - a. Volume of water
 - i. Vapor space
 - ii. Point of impingement
 - iii. 500 gpm minimum
 - b. Placement of streams
 - c. Manned vs. unmanned fire streams
- 10. Water stream demands for pressurized cylinder fires
 - a. Secured, uninterrupted source
 - b. Adequate stream application
- 11. What to do if the fire is prematurely extinguished
 - a. Vapor dispersion
 - b. Vapor control (close valve)
 - c. Secure or eliminate ignition sources
- 12. Valve types and their operation
 - a. Shut-off valves
 - b. Pressure relief valves
- 13. Alternative actions related to various hazards
 - a. Evacuate
 - b. Isolate
 - c. Allow self extinguishment
 - d. Retreat
- 14. When to retreat
 - a. Failure of relief valve
 - b. Significant container damage
 - c. Loss of water

Requisite Skills: The ability to execute effective advances and retreats, apply various techniques for water application, assess cylinder integrity and changing cylinder conditions, operate control valves, and choose effective procedures when conditions change.

- 102-6.3.4** Protect evidence of fire cause and origin, given a flashlight and overhaul tools, so that the evidence is noted and protected from further disturbance until investigators can arrive on the scene.

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Requisite Knowledge: Methods to assess origin and cause; types of evidence; means to protect various types of evidence; the role and relationship of Fire Fighter IIs, criminal investigators, and insurance investigators in fire investigations; and the effects and problems associated with removing property or evidence from the scene.

1. Methods to assess origin and cause
 - a. Legal considerations (Michigan v. Tyler court decision)
 - b. Unusual odors
 - c. Abnormal behavior of fire when water is applied
 - d. Obstacles hindering fire fighting
 - e. Incendiary devices
 - f. Trailer
 - g. Structural alterations
 - h. Fire patterns
 - i. Heat intensity
 - j. Availability of documents
 - k. Fire detection and protection systems
 - l. Intrusion alarms
 - m. Location of fire
 - n. Personal possessions
 - o. Household items
 - p. Equipment or inventory
 - q. Business records
 - r. Time of day
 - s. Weather conditions
 - t. Vehicles and people on scene

2. Types of evidence
 - a. Physical evidence
 - b. Trace or transfer evidence
 - c. Demonstrative evidence
 - d. Direct evidence
 - e. Circumstantial evidence

3. Means to protect various types of evidence
 - a. Securing the fire scene
 - b. Chain of custody
 - c. Do not gather or handle evidence
 - d. Avoid trampling over evidence
 - e. Avoid excess use of water
 - f. Protect human footprints and tire marks

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- g. Protect partially burned papers found in a furnace, stove or fireplace
 - h. Leave charred documents found in containers
4. Role and relationship of Fire Fighter to the fire investigation
- a. The importance of writing a chronological account of important circumstances personally observed
 - b. Identify the importance of reporting hearsay to the investigator
 - c. Identify the importance of performing salvage and overhaul carefully
5. Criminal investigators
- a. Fire marshal
 - b. Arson investigator
 - c. Fire investigator
 - d. Police
6. Insurance investigators in fire investigations
- a. Insurance investigator
 - b. Private investigator
7. Effects and problems associated with removing property or evidence from the scene
- a. Legal considerations (Michigan v. Tyler court decision)
 - b. Chain of custody
 - c. Documentation/photographs

Requisite Skills: The ability to locate the fire's origin area, recognize possible causes, and protect the evidence.

102-6.4 **Rescue Operations**

This duty shall involve performing activities related to accessing and disentangling victims from motor vehicle accidents and helping special rescue teams, according to the JPRs in 6.4.1 and 6.4.2.

- 102-6.4.1** Extricate a victim entrapped in a motor vehicle as part of a team, given stabilization and extrication tools, so that the vehicle is stabilized, the victim is disentangled without further injury, and hazards are managed.

Requisite Knowledge: The fire department's role at a vehicle accident, points of strength and weakness in auto body construction, dangers associated with vehicle components and systems, the uses and limitations

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of hand and power extrication equipment, and safety procedures when using various types of extrication equipment.

1. The fire department's role at a vehicle accident
 - a. Response
 - b. Arrival and size-up
 - c. Stabilization of the scene
 - d. Gaining access and disentangling victims
 - e. Removing and treating the victim

2. Points of strength in auto body construction
 - a. Vehicle door and door posts
 - b. Vehicle roof
 - c. Steering wheel
 - d. Vehicle floor
 - e. Vehicle pedals
 - f. Vehicle seats
 - g. Reinforced dashboard

3. Points of weaknesses in auto body construction
 - a. Vehicle windshield and windows
 - b. Dashboard

4. Dangers associated with vehicle components and systems
 - a. Vehicle stabilization
 - i. Upright
 - ii. Upside down
 - iii. On its side
 - iv. On an inclined surface
 - b. Airbag systems (SRS and SIPS)
 - c. Roll over protection systems (ROPS)
 - d. Hybrid electrical systems
 - e. Fuels

5. Uses and limitations of hand extrication equipment
 - a. Hydraulic devices
 - b. Pneumatic devices
 - c. Block and tackle
 - d. Cribbing and shoring materials
 - e. Ratchet device

6. Uses and limitations of power extrication equipment
 - a. Hydraulic extrication spreaders
 - b. Hydraulic extrication shears

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- c. Hydraulic extrication ram
- 7. Safety procedures when using various types of extrication equipment
 - a. PPE
 - b. Flammable hazards
 - c. Electrical hazards
 - d. Pinch hazards
 - e. Crush hazards
 - f. Vehicle safety device deployment hazards
 - g. Proper tool use

Requisite Skills: The ability to operate hand and power tools used for forcible entry and rescue as designed; use cribbing and shoring material; and choose and apply appropriate techniques for moving or removing vehicle roofs, doors, windshields, windows, steering wheels or columns, and the dashboard.

- 102-6.4.2** Assist rescue operation teams, given standard operating procedures, necessary rescue equipment, and an assignment, so that procedures are followed, rescue items are recognized and retrieved in the time as prescribed by the AHJ, and the assignment is completed.

Requisite Knowledge: The fire fighter's role at a technical rescue operation, the hazards associated with technical rescue operations, types and uses for rescue tools, and rescue practices and goals.

- 1. The fire fighter's role at a technical rescue operation
 - a. Safety
 - b. Receive direction from technical rescue personnel
 - c. Work as a team
 - d. Basic components of rescue operations
 - i. Preparation
 - ii. Response
 - iii. Arrival and size-up
 - iv. Stabilization
 - v. Access
 - vi. Disentanglement
 - vii. Removal
 - viii. Transport
 - ix. Security of the scene and preparation for next call
 - x. Post incident analysis
- 2. The hazards associated with technical rescue operations
 - a. Machinery

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- b. Confined space
 - c. Rope rescue (Vertical rescue)
 - d. Trench
 - e. Structural collapse
 - f. Water and ice
 - g. Energized electrical line
 - h. Elevator and escalator emergencies
 - i. Wilderness
 - j. Mine, tunnel and cave
 - k. Industrial/Hazardous Materials
3. Types and uses of rescue tools
- a. Machinery (e.g., hydraulic spreaders/cutters/rams)
 - b. Confined space, (e.g., taglines, harnesses, supplied air respirators, air monitoring devices, tripod, winch)
 - c. Rope rescue (Vertical rescue), (e.g., rope, carabiners, anchor plates, pulleys)
 - d. Trench, (e.g., shoring, cribbing, stringers, rakers, air monitoring devices)
 - e. Structural collapse, (e.g., jacks, shoring, cribbing)
 - f. Water and ice, (e.g., PFDs, throw bag of rope)
 - g. Elevator and escalator emergencies, (e.g., elevator keys)
 - h. Wilderness, (e.g., compass, GPS, stokes basket)
 - i. Mine, tunnel and cave, (e.g., shoring, ropes, flashlights)
4. Rescue practices and goals
- i. Machinery
 - ii. Confined space
 - iii. Rope rescue (Vertical rescue)
 - iv. Trench
 - v. Structural collapse
 - vi. Water and ice
 - vii. Elevator and escalator emergencies
 - viii. Wilderness
 - ix. Mine, tunnel and cave

Requisite Skills: The ability to identify and retrieve various types of rescue tools, establish public barriers, and assist rescue teams as a member of the team when assigned.

102-6.5 **Prevention, Preparedness, and Maintenance**

This duty shall involve performing activities related to reducing the loss of life and property due to fire through hazard identification, inspection, and response readiness, according to the JPRs in 6.5.1 through 6.5.5.

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- 102-6.5.1** Perform a fire safety survey in a private dwelling, given survey forms and procedures, so that fire and life safety hazards are identified, recommendations for their correction are made to the occupant, and unresolved issues are referred to the proper authority.

Requisite Knowledge: Organizational policy and procedures, common causes of fire and their prevention, the importance of a fire safety survey and public fire education programs to fire department public relations and the community, and referral procedures.

1. Organizational policy and procedures
 - a. Scheduling considerations
 - i. FD personnel
 - ii. Dwelling owner
 - b. Approach and introduction
 - c. Conducting the survey
 - d. Formulate recommendations

2. Common causes of fire and their prevention
 - a. Housekeeping practices
 - b. Smoking
 - c. Open burning
 - d. Electrical sources of ignition
 - e. Common hazards by location
 - i. Kitchen
 - ii. Living area
 - iii. Bedroom
 - iv. Garage/storage
 - v. Bathroom
 - vi. Laundry
 - vii. Attics and basements
 - viii. Exterior
 - f. Special hazards

3. The importance of a fire safety survey and public fire education programs to fire department public relations and the community
 - a. Enhances community life safety
 - b. Prevents loss
 - c. Promotes community support

4. Referral procedures - AHJ

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Requisite Skills: The ability to complete forms, recognize hazards, match findings to preapproved recommendations, and effectively communicate findings to occupants or referrals.

102-6.5.2 Present fire safety information to station visitors or small groups, given prepared materials, so that all information is presented, the information is accurate, and questions are answered or referred.

Requisite Knowledge: Parts of informational materials and how to use them, basic presentation skills, and departmental standard operating procedures for giving fire station tours.

1. Educational programs
 - a. Learn Not to Burn
 - b. EDITH (Exit Drills in the Home)
 - c. Installation and maintenance of smoke alarms
 - d. Change your clock – change your battery
 - e. Stop Drop and Roll
 - f. Fire safety for babysitters
 - g. Fire safety for seniors
 - h. Fire safety for college students
 - i. Wildland prevention program
2. How to use informational materials
 - a. Pamphlets
 - b. Coloring books
 - c. Public service announcements (PSAs)
 - d. Public presentations
3. Basic presentation skills
 - a. Age and audience appropriateness
 - b. Knowledge of subject – preparation
 - c. Use of props
 - d. Professional attire
 - e. Positive attitude
4. Departmental standard operating procedures (SOPs) for giving fire station tours - AHJ

Requisite Skills: The ability to document presentations and to use prepared materials.

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- 102-6.5.3** Prepare a preincident survey, given forms, necessary tools, and an assignment, so that all required occupancy information is recorded, items of concern are noted, and accurate sketches or diagrams are prepared.

Requisite Knowledge: The sources of water supply for fire protection; the fundamentals of fire suppression and detection systems; common symbols used in diagramming construction features, utilities, hazards, and fire protection systems; departmental requirements for a preincident survey and form completion; and the importance of accurate diagrams.

1. The sources of water for fire protection
 - a. Pressurized
 - b. Static

2. The fundamentals of fire suppression and detection systems
 - a. Automatic sprinkler systems
 - i. Types
 - a) Wet pipe
 - b) Dry pipe
 - c) Pre-action
 - d) Deluge
 - e) Residential
 - ii. Sprinkler heads
 - a) Deflector style
 - 1) Upright
 - 2) Pendant
 - 3) Side wall
 - 4) Deluge
 - 5) Special
 - b) Activating devices
 - 1) Fusible link
 - 2) Frangible bulb
 - 3) Chemical pellet
 - iii. Control valves
 - a) Outside screw and yoke (OS&Y)
 - b) Butterfly valve
 - c) Wall post indicator valve (WPIV)
 - d) Post indicator valve (PIV)
 - e) Post indicator valve assembly (PIVA)
 - iv. Valves
 - a) Check valve
 - b) Main drain
 - c) Alarm test
 - d) Inspector test

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- v. Fire department connection (FDC)
 - a) Two 2 ½" inlets
 - b) One large diameter hose (LDH)
- b. Standpipe systems
 - i. Class I
 - a) Fire department use only
 - b) 2 ½" connection with a valve
 - ii. Class II
 - c) Occupant use
 - d) 1 ½" single jacket hose preconnected
 - iii. Class III
 - a) Occupant or fire department use
 - b) 2 ½" connection with 1 ½" reducer and hose preconnected
- c. Specialized extinguishment systems
 - i. Dry chemical systems
 - ii. Wet chemical systems
 - iii. Foam systems
 - iv. Clean agent systems
 - v. Carbon dioxide systems
- d. Fire department notification systems
 - i. Local alarm systems
 - ii. Remote station systems
 - iii. Auxiliary systems
 - iv. Proprietary systems
 - v. Central station systems
- e. Fire alarm system components
 - i. Initiating devices
 - a) Heat detectors
 - 1) Fixed-temperature detectors
 - 2) Rate-of-rise detectors
 - 3) Combination rate-of-rise fixed temperature detectors
 - b) Smoke detectors
 - 1) Ionization
 - 2) Photoelectric
 - c) Flame detectors
 - 1) Ultraviolet (UV)
 - 2) Infrared (IR)
 - d) Fire – gas detectors
 - e) Manual pull station
 - ii. Indicating devices
 - a) Audible
 - 1) Bells

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- 2) Horns
 - 3) Sirens
 - 4) Recorded announcement
 - b) Visual
 - 1) Strobes
 - 2) Rotating beacons
 - c) Fire alarm control panel (FACP)
3. Common symbols used in diagramming construction features, utilities, hazards, and fire protection systems
- a. Construction features
 - i. Fire escape
 - ii. Skylight
 - iii. Stairs
 - iv. Elevator
 - v. Fire wall
 - b. Utilities
 - i. Gas
 - ii. Electric
 - iii. Water
 - c. Fire protection
 - i. Hydrant
 - ii. Sprinkler riser
 - iii. Fire department connection
 - iv. Automatic sprinklers
 - v. Not sprinklered
 - vi. Standpipe
 - vii. Fire alarm
 - viii. Fire pump
 - d. Hazards
 - i. Gasoline tank
 - ii. Steam boiler
 - a) Vertical
 - b) Horizontal
4. Departmental requirements for a preincident survey
- a. Tactical information - considerations/planning for:
 - i. Water supply
 - ii. Utilities
 - iii. Search and rescue
 - iv. Forcible entry
 - v. Ladder placement
 - vi. Ventilation
 - b. Occupancy type

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- i. High rise
 - ii. Assembly
 - iii. Health care facilities
 - iv. Detention and correctional facilities
 - v. Residential occupancies
 - c. Locations requiring special considerations
 - i. Gas or liquid fuel pipelines
 - ii. Electrical transmission lines
 - iii. Ships and waterways
 - iv. Subways
 - v. Railroads
 - vi. Airports
 - vii. Industrial facilities
 - viii. Hazardous materials bulk storage locations
5. Departmental requirements for form completion - AHJ
6. The importance of accurate diagrams
 - a. Accurate diagrams promote better decision making
 - b. Enhances civilian and firefighter safety
 - c. Search and rescue operations are conducted efficiently

Requisite Skills: The ability to identify the components of fire suppression and detection systems; sketch the site, buildings, and special features; detect hazards and special considerations to include in the preincident sketch; and complete all related departmental forms.

- 102-6.5.4** Maintain power plants, power tools, and lighting equipment, given tools and manufacturers' instructions, so that equipment is clean and maintained according to manufacturer and departmental guidelines, maintenance is recorded, and equipment is placed in a ready state or reported otherwise.

Requisite Knowledge: Types of cleaning methods, correct use of cleaning solvents, manufacturer and departmental guidelines for maintaining equipment and its documentation, and problem-reporting practices.

1. Types of cleaning methods
 - a. Metal parts
 - b. Wood parts
 - c. Fiberglass/synthetic parts
 - d. Cutting edges
 - e. Power tools

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- f. Electrical/electronic devices
2. Correct use of cleaning solvents
 - a. Associated hazards
 - b. Application
 - c. Safety considerations
3. Manufacturer and departmental guidelines for maintaining equipment and its documentation
 - a. Per the manufacturer's recommendations
 - b. Inspection frequency and procedures per AHJ
4. Problem-reporting practices
 - a. Tag problem item
 - b. Remove from service
 - c. Report problem per AHJ

Requisite Skills: The ability to select correct tools; follow guidelines; complete recording and reporting procedures; and operate power plants, power tools, and lighting equipment.

- 102-6.5.5** Perform an annual service test on fire hose, given a pump, a marking device, pressure gauges, a timer, record sheets, and related equipment, so that procedures are followed, the condition of the hose is evaluated, any damaged hose is removed from service, and the results are recorded.

Requisite Knowledge: Procedures for safely conducting hose service testing, indicators that dictate any hose be removed from service, and recording procedures for hose test results.

1. Procedures for safety conducting hose service testing
 - a. Routine inspection
 - i. Lay clean hose out on flat surface
 - ii. Inspect hose for defects
 - iii. Mark defects as found
 - iv. Tag hose with description of defects found
 - b. Annual service test
 - i. Don protective gear – wear helmet and gloves at a minimum
 - ii. Connect up to 300 feet maximum of hose to a discharge outlet
 - iii. Attach a nozzle or valve to the end of the hose
 - iv. Fill hose to 50 psi, remove air, twists and kinks in hose

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- v. Mark hose at the base of the coupling
 - vi. Check couplings and hose for leaks
 - vii. If couplings leak at the gasket, replace the gasket
 - viii. After gaskets are replaced or if no leaks are present, increase pressure to manufacturer's recommended pressure per NFPA 1962 and maintain for 5 minutes
 - ix. Monitor hose and couplings for leaks or failure
 - x. Reduce pressure, depressurize hose, and drain
 - xi. Inspect marks at couplings for separation or slippage
 - xii. Tag failures or defects
 - xiii. Distinctly mark hose that passed
 - xiv. Log test results for departmental record
- c. Safety notes:
- i. Always wear a helmet and gloves while working around pressurized hose
 - ii. Never walk over, straddle, or stand over hose being pressure tested
2. Indicators that dictate any hose be removed from service
- a. Mechanical damage
 - i. Bent or damaged couplings
 - ii. Hose separating from couplings
 - iii. Cuts or holes
 - iv. Crushed suction hose
 - b. Chemical damage
 - i. Chemical degradation
 - ii. Contamination
 - c. Heat damage
 - i. Burn holes
 - ii. Delamination
 - d. Mildew/rot
 - e. Service test pressure failure (i.e. burst hose)
3. Recording procedures for hose test results
- a. Hose records should contain:
 - i. Hose size/length, type, and diameter
 - ii. Date of manufacture
 - iii. Date of purchase
 - iv. Testing dates
 - v. Any repairs made
 - b. Other information per AHJ

Requisite Skills: The ability to operate hose testing equipment and nozzles and to record results.

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REFERENCE LIST FOR THE HAZARDOUS MATERIALS TECHNICIAN CURRICULUM

This Reference List is provided as a general guide for both instructors and students to locate information pertaining to the specific objectives in the TCFP Curriculum. This list is **not** all-inclusive and does not in any way limit TCFP development and use of questions to test the objectives of the curriculum:

Required References

Texts

Certification Curriculum Manual. Texas Commission on Fire Protection. (Most current edition). Austin, TX: Texas Commission on Fire Protection.

Code of Federal Regulations, Title 29 Part 1910.120, Appendix A. United States. U.S. Department of Labor, Occupational Safety & Health Administration.
http://edocket.access.gpo.gov/cfr_2007/julqtr/pdf/29cfr1910.120.pdf

Emergency Action Guides. Association of American Railroads. (2006). Pueblo, CO: Association of American Railroads.

Emergency Response Guidebook. United States. (Most current edition). Washington, DC: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration.

Fire Fighter's Handbook of Hazardous Materials, 7th edition. Baker, Charles T., (2006). Sudbury, MA: Jones and Bartlett.

Hazardous Materials: Managing the Incident. Chester Noll, G. G., Hildebrand, M. S., & Yvorra, J. G. (2005). MD: Red Hat Publishing, Inc.

Hazardous Materials/Weapons of Mass Destruction Response Handbook Trebisacci, D. G. (2008). 5th edition. Quincy, MA: National Fire Protection Association.

NFPA 472: Standard for Professional Competence of Responders to Hazardous Materials Incidents. (2008 ed.). Quincy, MA: NFPA Publications. National Fire Protection Association

NIOSH Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and Health. (Most current edition). Cincinnati, OH: US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health.

Standards Manual for Fire Protection Personnel. Texas Commission on Fire Protection. (Most current edition). Austin, TX: Texas Commission on Fire Protection.

Recommended References

The most current edition of the following publications and media are recommended (not required) supplemental material for program use.

Texts

Bretherick's Handbook of Reactive Chemical Hazards. Urben, P. G., Pitt, M. J., & Bretherick, L. (2007). Amsterdam: Elsevier.

Chlorine Emergencies: An Overview for First Responders. Chlorine Institute. (2007). Arlington, VA: The Chlorine Institute.

CHRIS: Chemical Hazards Response Information System. United States. (1992). COMDTINST, M16465.11B. Washington, DC: U.S. Dept. of Transportation, U.S. Coast Guard.

Dangerous Properties of Industrial and Consumer Chemicals. New Cheremisinoff, N. P., King, J. A., & Boyko, R. (1994). York, NY: M. Dekker.

Emergency Care for Hazardous Materials Exposure. St. Currence, P., Bronstein, A. C., & Clements, B. (2005). Louis, MO: Mosby.

Emergency Handling of Hazardous Materials in Surface Transportation. Association of American Railroads. (2009). Washington, DC: Association of American Railroads.

Field Guide to Tank Car Identification. Association of American Railroads. (2009). Washington, DC: Association of American Railroads.

Fire Protection Guide to Hazardous Materials. National Fire Protection Association. (2001). Quincy, MA: National Fire Protection Association.

Hawley's Condensed Chemical Dictionary. Lewis, R. J., & Hawley, G. G. (2007). West Sussex, England: Wiley.

Hazardous Materials Air Monitoring and Detection Devices. Hawley, C. (2002). Albany, NY: Delmar/Thomson Learning.

Hazardous Materials Field Guide, 2nd edition. Bevelacqua, A. S., & Stilp, R. H. (2007). Albany, NY: Delmar Publications.

Hazardous Materials: Managing the Incident Field Operations Guide. Chester Bevelacqua, A. S., Hildebrand, M. S., & Noll, G. G. (2005). MD: Red Hat Publishing, Inc.

How to Use the Chlorine Institute Emergency Kit "A" for 100 lb. and 150 lb. Chlorine Cylinders. Chlorine Institute. (1996). New York, NY: The Chlorine Institute.

How to Use the Chlorine Institute Emergency Kit "B" for Chlorine Ton Containers. New Chlorine Institute. (1988). York, NY: The Chlorine Institute.

How to Use the Chlorine Institute Emergency Kit "C" for Chlorine Tank Cars and Tank Trucks. Chlorine Institute. (1993). New York, NY: The Chlorine Institute.

Symbol Seeker: Hazard Identification Manual. Burns, P. P. (2002). Preston, England: Symbol Seeker.

Media

Hazardous Materials Containment Series. Action Training Systems. [4 Disc DVD Set]
Hazardous materials containment - series of 4 titles. Seattle, WA: Action Training
Systems.

Hazardous Materials: Managing the Incident DVD Series. Massingham, G., Noll, G. G.,
Hildebrand, M. S., & Noll, G. G. (2005). [8 Disc DVD Set] Edgartown, MA: Emergency
Film Group.

Intermodal Containers. Noll, G. G., Hildebrand, M. S., & Donahue, M. L. (2002). [DVD]
Edgartown, MA: Emergency Film Group.

Petroleum Storage Tanks. Hildebrand, M. S., & Noll, G. G. (2003). [DVD] Edgartown, MA:
Emergency Film Group.

**CHAPTER 6
SECTION 604
HAZARDOUS MATERIALS TECHNICIAN
CURRICULUM OUTLINE**

SECTION	SUBJECT	RECOMMENDED HOURS
604-7.1	General - Introduction - Laws, Regulations, and National Consensus Standards	2
604-7.2	Analyzing the Incident	28
604-7.3	Planning the Response	24
604-7.4	Implementing the Planned Response	56
604-7.5	Evaluating Progress	4
604-7.6	Terminating the Incident	6
	TOTAL RECOMMENDED HOURS	120

The recommended hours include time for skills evaluation and are based on 12 students. Hours needed depend on the actual number of students.

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SECTION 604

HAZARDOUS MATERIAL TECHNICIAN

Hazardous Materials Technician Level Personnel are those who respond to hazardous materials/weapons of mass destruction (WMD) incidents and

- Use a risk-based response process to analyze a problem involving hazardous materials/weapons of mass destruction (WMD),
- Select and implement applicable decontamination procedures,
- Control a release,
- Use specialized protective clothing, and
- Use specialized control equipment.

The Hazardous Materials Technician must first master all the job performance requirements and knowledge, skills and abilities pertaining to:

- Awareness Level Personnel,
- Operations Level Responders, and
- The competencies of this chapter

Response options for technician level responders may include offensive actions.

604-7.1 **General**

604-7.1.1 **Introduction**

604-7.1.1.1 The hazardous materials technician shall be that person who responds to hazardous materials/WMD incidents using a risk-based response process by which he or she analyzes a problem involving hazardous materials/WMD, selects applicable decontamination procedures, and controls a release using specialized protective clothing and control equipment [see 7.1.2.2(1)]

604-7.1.1.2 The hazardous materials technician shall be trained to meet all competencies at the awareness level (Section 601), all core competencies at the operations level (Section 602), and all competencies of this chapter

604-7.1.1.3 The hazardous materials technician shall receive additional training to meet applicable governmental occupational health and safety regulations

604-7.1.1.4 The hazardous materials technician shall be permitted to have additional competencies that are specific to the response mission, expected tasks, and equipment and training as determined by the AHJ

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604-7.1.2 **Goal**

604-7.1.2.1 The goal of the competencies at this level shall be to provide the hazardous materials technician with the knowledge and skills to perform the tasks in 7.1.2.2 safely

604-7.1.2.2 In addition to being competent at both the awareness and the operations levels, the hazardous materials technician shall be able to perform the following tasks:

1. Analyze a hazardous materials/WMD incident to determine the complexity of the problem and potential outcomes by completing the following tasks:
 - a. Survey the hazardous materials/WMD incident to identify special containers involved, to identify or classify unknown materials, and to verify the presence and concentrations of hazardous materials through the use of monitoring equipment
 - b. Collect and interpret hazard and response information from printed and technical resources, computer databases, and monitoring equipment
 - c. Describe the type and 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. Describe the response objectives for hazardous materials/WMD incidents
 - b. Describe the potential response options available by response objective
 - c. Select the personal protective equipment required for a given action option
 - d. Select a technical decontamination process to minimize the hazard
 - e. Develop an incident action plan for a hazardous materials/WMD incident, including a site safety and control plan, consistent with the emergency response plan or standard operating procedures and within the capability of the available personnel, personal protective equipment, and control equipment

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3. Implement the planned response to favorably change the outcomes consistent with the standard operating procedures and site safety and control plan by completing the following tasks:
 - a. Perform the duties of an assigned hazardous materials branch or group position within the local Incident Command System (ICS)
 - b. Don, work in, and doff personal protective clothing, including, but not limited to, both liquid splash- and vapor-protective clothing with correct respiratory protection
 - c. Perform the control functions identified in the incident action plan
 - d. Perform the decontamination functions identified in the incident action plan
4. Evaluate the progress of the planned response by completing the following tasks:
 - a. Evaluate the effectiveness of the control functions
 - b. Evaluate the effectiveness of the decontamination process
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

604-7.2

Competencies — Analyzing the Incident

604-7.2.1

Surveying Hazardous Materials/WMD Incidents

Given examples of hazardous materials/WMD incidents, the hazardous materials technician shall identify containers involved and, given the necessary equipment, identify or classify unknown materials involved, verify the identity of the hazardous materials/WMD involved, determine the concentration of hazardous materials, and shall meet the requirements of 7.2.1.1 through 7.2.1.5

604-7.2.1.1

Given examples of various containers for hazardous materials/WMD, the hazardous materials technician shall identify each container by name and specification and identify the typical contents by name and hazard class

604-7.2.1.1.1

Given examples of the following railroad cars, the hazardous materials technician shall identify the container by name and specification and identify the typical contents by name and hazard class:

1. Cryogenic liquid tank cars

2. Nonpressure tank cars
3. Pneumatically unloaded hopper cars
4. Pressure tank cars

604-7.2.1.1.2 Given examples of the following intermodal tanks, the hazardous materials technician shall identify the container by name and specification and identify the typical contents by name and hazard class:

1. Nonpressure intermodal tanks
 - a. IM-101 portable tanks (IMO Type 1 internationally)
 - b. IM-102 portable tanks (IMO Type 2 internationally)
2. Pressure intermodal tank (DOT Specification 51; IMO Type 5 internationally)
3. Specialized intermodal tanks
 - a. Cryogenic intermodal tanks (DOT Specification 51; IMO Type 7 internationally)
 - b. Tube modules

604-7.2.1.1.3 Given examples of the following cargo tanks, the hazardous materials technician shall identify the container by name and specification and identify the typical contents by name and hazard class:

1. Compressed gas tube trailers
2. Corrosive liquid tanks
3. Cryogenic liquid tanks
4. Dry bulk cargo tanks
5. High-pressure tanks
6. Low-pressure chemical tanks
7. Nonpressure liquid tanks

604-7.2.1.1.4 Given examples of the following facility storage tanks, the hazardous materials technician shall identify the container by name and identify the typical contents by name and hazard class:

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1. Cryogenic liquid tank
2. Nonpressure tank
3. Pressure tank

604-7.2.1.1.5 Given examples of the following nonbulk packaging, the hazardous materials technician shall identify the package by name and identify the typical contents by name and hazard class:

1. Bags
2. Carboys
3. Cylinders
4. Drums

604-7.2.1.1.6 Given examples of the following radioactive materials packages, the hazardous materials technician shall identify the container/package by name and identify the typical contents by name:

1. Excepted
2. Industrial
3. Type A
4. Type B
5. Type C

604-7.2.1.2 Given examples of three facility and three transportation containers, the hazardous materials technician shall identify the approximate capacity of each container

604-7.2.1.2.1 Using the markings on the container, the hazardous materials technician shall identify the capacity (by weight or volume) of the following examples of transportation vehicles:

1. Cargo tanks
2. Tank cars

3. Tank containers

604-7.2.1.2.2 Using the markings on the container and other available resources, the hazardous materials technician shall identify the capacity (by weight or volume) of each of the following facility containers:

1. Cryogenic liquid tank
2. Nonpressure tank (general service or low-pressure tank)
3. Pressure tank

604-7.2.1.3 Given at least three unknown hazardous materials/WMD, one of which is a solid, one a liquid, and one a gas, the hazardous materials technician shall identify or classify by hazard each unknown material

604-7.2.1.3.1 The hazardous materials technician shall identify the steps in an analysis process for identifying unknown solid and liquid materials

1. Approach from up wind
2. Wear appropriate level of Chemical Protective Clothing (CPC)
3. Work in pairs
4. Have backup team
5. Monitor in the following order:
 - a. Radioactivity
 - b. Oxygen availability
 - c. pH (if a liquid or soluble solid)

604-7.2.1.3.2 The hazardous materials technician shall identify the steps in an analysis process for identifying an unknown atmosphere

1. Approach from up wind
2. Wear appropriate level of CPC
3. Work in pairs
4. Have backup team
5. Monitor in the following order:
 - a. Radioactivity

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- b. Combustibility
- c. Oxygen
 - i. Deficiency
 - ii. Enriched
- d. pH (if possible corrosive)
- e. Hydrogen sulfide
- f. Carbon monoxide
- g. Organic vapor

604-7.2.1.3.3 The hazardous materials technician shall identify the type(s) of monitoring technology used to determine the following hazards:

- 1. Corrosivity
- 2. Flammability
- 3. Oxidation potential
- 4. Oxygen deficiency
- 5. Pathogenicity
- 6. Radioactivity
- 7. Toxicity

604-7.2.1.3.4 The hazardous materials technician shall identify the capabilities and limiting factors associated with the selection and use of the following monitoring equipment, test strips, and reagents:

- 1. Biological immunoassay indicators
- 2. Chemical agent monitors (CAMs)
- 3. Colorimetric indicators [colorimetric detector tubes, indicating papers (pH paper and meters), reagents, test strips]
- 4. Combustible gas indicator
- 5. DNA fluoroscopy
- 6. Electrochemical cells (carbon monoxide meter, oxygen meter)
- 7. Flame ionization detector

8. Gas chromatograph/mass spectrometer (GC/MS)
9. Infrared spectroscopy
10. Ion mobility spectroscopy
11. Mass channel analyzer
12. Metal oxide sensor
13. Photoionization detectors
14. Polymerase chain reaction (PCR)
15. Radiation detection and measurement instruments
16. Raman spectroscopy
17. Surface acoustical wave (SAW)
18. Wet chemistry

604-7.2.1.3.5 Given three hazardous materials/WMD, one of which is a solid, one a liquid, and one a gas, and using the following monitoring equipment, test strips, and reagents, the hazardous materials technician shall select from the following equipment and demonstrate the correct techniques to identify the hazards (corrosivity, flammability, oxidation potential, oxygen deficiency, radioactivity, toxicity, and pathogenicity):

1. Carbon monoxide meter
2. Colorimetric tubes
3. Combustible gas indicator
4. Oxygen meter
5. Passive dosimeters
6. pH indicators and pH meters
7. Photoionization and flame ionization detectors
8. Radiation detection instruments

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9. Reagents
10. Test strips
11. WMD detectors (chemical and biological)
12. Other equipment provided by the AHJ

604-7.2.1.3.6 Given monitoring equipment, test strips, and reagents provided by the AHJ, the hazardous materials technician shall demonstrate the field maintenance and testing procedures for those items

604-7.2.1.4 Given a label for a radioactive material, the hazardous materials technician shall identify the type or category of label, contents, activity, transport index, and criticality safety index as applicable, then describe the radiation dose rates associated with each label

604-7.2.1.5 The hazardous materials technician shall demonstrate methods for collecting samples of the following:

1. Gas
2. Liquid
3. Solid

604-7.2.2 **Collecting and Interpreting Hazard and Response Information**
Given access to printed and technical resources, computer databases, and monitoring equipment, the hazardous materials technician shall collect and interpret hazard and response information not available from the current edition of the DOT *Emergency Response Guidebook* or an MSDS and shall meet the requirements of 7.2.2.1 through 7.2.2.6

604-7.2.2.1 The hazardous materials technician shall identify and interpret the types of hazard and response information available from each of the following resources and explain the advantages and disadvantages of each resource:

1. Hazardous materials databases – examples include:
 - a. CAMEO (Computer Assisted Management of Emergency Operations)
 - b. MARPLOT (Mapping Applications for Response, Planning and Local Operational Tasks)
 - c. ALOHA (Aerial Locations Of Hazardous Atmospheres)

- d. WISER (Wireless Informational Systems for Emergency Responders)
 - e. OREIS (Operational Response Emergency Informational System)
2. Monitoring equipment – examples include:
 - a. Combustible gas indicators
 - b. Colorimetric tubes
 - c. Photoionization detectors/flame ionization detectors
 - d. Radiological survey equipment
 - e. Oxygen meters
 - f. Toxic Gas Sensors
 - g. pH paper
 - h. Chemical test strips
 3. Reference manuals
 - a. DOT Emergency Response Handbook
 - b. ARR Hazardous Materials Emergency Action Guides
 - c. ARR General Handling of Hazardous Materials in Surface Transportation
 - d. Field Guide to Tank Guide Identification
 - e. Bretherick's Handbook of Reactive Substances
 - f. Emergency Care for Hazardous Materials Exposure
 - g. Hawley's Condensed Chemical Dictionary
 - h. NIOSH Pocket Guide
 - i. CHRIS Chemical Hazards Response Information System (USCG)
 - j. Dangerous Properties of Industrial Chemicals
 - k. NFPA Fire Protection Guide of Hazardous Materials
 4. Technical information centers (i.e., CHEMTREC/CANUTEC/ SETIQ and local, state, and federal authorities) – examples include:
 - a. CHEMTREC
 - b. Chlorine Institute
 - c. US Coast Guard and DOT National Response Center
 - d. The Agency for Toxic Substance and Disease Registry (ATSDR)
 - e. National Animal Poison Control Center (NAPCC)
 - f. National Pesticide Informational Center (NPIC)
 - g. National Poison Control Center (Mr. Yuck)
 - h. US Army Operational Center
 - i. Defense Logistics Agency
 5. Technical information specialists

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6. Hazard Communication and Right To Know Reporting Requirements
 - a. OSHA Hazardous Communication Standard 29 CFR 1910.1200
 - b. Material Safety Data Sheets
 - c. Tier II Reports
 - d. EPA EPlan Database
 - e. Other federal, state and local reporting requirements

604-7.2.2.2 The hazardous materials technician shall describe the following terms and explain their significance in the analysis process:

1. Acid, caustic
2. Air reactivity
3. Autorefrigeration
4. Biological agents and biological toxins
5. Blood agents
6. Boiling point
7. Catalyst
8. Chemical change
9. Chemical interactions
10. Compound, mixture
11. Concentration
12. Critical temperature and pressure
13. Dissociation and corrosivity
14. Dose
15. Dose response
16. Expansion ratio
17. Fire point

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18. Flammable (explosive) range (LEL and UEL)
19. Flash point
20. Half-life
21. Halogenated hydrocarbon
22. Ignition (autoignition) temperature
23. Inhibitor
24. Instability
25. Ionic and covalent compounds
26. Irritants (riot control agents)
27. Maximum safe storage temperature (MSST)
28. Melting point and freezing point
29. Miscibility
30. Nerve agents
31. Organic and inorganic
32. Oxidation potential
33. Persistence
34. pH
35. Physical change
36. Physical state (solid, liquid, gas)
37. Polymerization
38. Radioactivity
39. Reactivity

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40. Riot control agents
41. Saturated, unsaturated (straight and branched), and aromatic hydrocarbons
42. Self-accelerating decomposition temperature (SADT)
43. Solubility
44. Solution and slurry
45. Specific gravity
46. Strength
47. Sublimation
48. Temperature of product
49. Toxic products of combustion
50. Vapor density
51. Vapor pressure
52. Vesicants (blister agents)
53. Viscosity
54. Volatility

604-7.2.2.3 The hazardous materials technician shall describe the heat transfer processes that occur as a result of a cryogenic liquid spill

604-7.2.2.4 Given five hazardous materials/WMD scenarios and the associated reference materials, the hazardous materials technician shall identify the signs and symptoms of exposure to each material and the target organ effects of exposure to that material

604-7.2.2.5 The hazardous materials technician shall identify two methods for determining the pressure in bulk packaging or facility containers

1. Fixed pressure gauge
2. Attach a pressure gauge

3. Determine temperature of the product and use a vapor pressure/temperature conversion chart

604-7.2.2.6 The hazardous materials technician shall identify one method for determining the amount of lading remaining in damaged bulk packaging or facility containers

1. Shipping papers and related documents
2. Fixed gauging devices
3. Weigh small nonbulk cylinders
4. Infrared cameras
5. Visible frost line on liquefied gas containers

604-7.2.3 ***Describing the Condition of the Container Involved in the Incident.***

Given examples of container damage, the hazardous materials technician shall describe the damage and shall meet the related requirements of 7.2.3.1 through 7.2.3.5

604-7.2.3.1 Given examples of containers, including the DOT specification markings for nonbulk and bulk packaging, and associated reference guides, the hazardous materials technician shall identify the basic design and construction features of each container

604-7.2.3.1.1 The hazardous materials technician shall identify the basic design and construction features, including closures, of the following bulk containers: NOTE: CGA=Compressed Gas Association, MC= Motor Carrier, TC=Transport Canada, DOT=Dept. of Transportation, SCT=Secretariat of Communications and Transportation [Mexico])

1. Cargo tanks
 - a. Compressed gas tube trailers
 - b. Corrosive liquid tanks
 - DOT 412, TC 412, SCT 312, MC 312, TC 312
 - c. Cryogenic liquid tanks
 - MC 338, TC 338, SCT 338, TC 341, CGA 341
 - d. Dry bulk cargo tanks

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- e. High pressure tanks
 - MC 331, TC 331, SCT 331
 - f. Low pressure chemical tanks
 - DOT 407, TC 407, SCT 307, MC 307, TC 307
 - g. Non-pressure liquid tanks
 - DOT 406, TC 406, SCT 306, MC 306, TC 306
2. Fixed facility tanks
- a. Cryogenic liquid tank
 - i. Refrigerated storage tanks=less than 15 psi
 - ii. High pressure cryogenic tanks=greater than 15psi
 - b. Non-pressure tank (Atmospheric pressure=0-0.5 psi)
 - i. Horizontal tank
 - ii. Cone roof tank
 - iii. Floating roof tank
 - iv. Covered floating roof tank
 - v. Floating roof with geodesic dome
 - vi. Lifter roof tank
 - vii. Vapor dome roof tank
 - viii. Underground storage tanks
 - c. Pressure tank
 - i. Low Pressure (0.5-15 psi)
 - a) Vertical dome roof tanks
 - ii. High pressure (greater than 15 psi)
 - a) Horizontal pressure vessel
 - b) Spherical pressure vessel
 - c) Noded spheroid
 - d) Underground high pressure
3. Intermediate bulk containers (also known as tote tanks)
4. Intermodal tanks
- a. Nonpressure intermodal tanks
 - i. IM-101 portable tank (IMO Type 1 internationally)
 - a) 25.4 – 100 psig
 - b) 5,000 – 6,340 gallon normal capacity
 - ii. IM-102 portable tank (IMO Type 2 internationally)
 - a) 14.5 – 24.4 psig
 - b) 5,000 – 6,340 gallon normal capacity

- b. Pressure intermodal tanks (DOT Specification 51; IMO Type 5 internationally)
 - i. 100 – 500 psi
 - ii. 4,500 – 5,500 gallon normal capacity
 - c. Specialized intermodal tanks
 - i. Cryogenic intermodal tanks (DOT Specification 51; IMO Type 7 internationally)
 - a) Insulated space is normally maintained under vacuum
 - b) 4,500 – 5,500 gallons normal capacity
 - ii. Tube modules
 - a) 2,400 – 5,000 psi
 - b) Cylinders range from 9 – 48 inches in diameter
5. One-ton containers (pressure drums)
6. Pipelines
7. Railroad cars
- a. Cryogenic liquid tank cars
 - b. Nonpressure tank cars (general service or low pressure cars)
 - c. Pneumatically unloaded hopper cars
 - d. Pressure tank cars
 - e. Other specialized cars

604-7.2.3.1.2 The hazardous materials technician shall identify the basic design and construction features, including closures of the following nonbulk containers:

- 1. Bags
- 2. Carboys and Jerricans
- 3. Cylinders
- 4. Drums
 - a. Types
 - i. Open head
 - ii. Closed head
 - b. Construction Materials
 - i. Metal
 - ii. Plastic
 - iii. Fiberboard
 - iv. Other suitable materials

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- c. Fittings
 - i. Bungs
 - ii. Chime ring

5. Dewar flask (cryogenic liquids)

604-7.2.3.1.3 The hazardous materials technician shall identify the basic design features and testing requirements on the following radioactive materials packages:

1. Excepted
2. Industrial
3. Type A
4. Type B
5. Type C – used in air shipments

604-7.2.3.2 The hazardous materials technician shall describe how a liquid petroleum product pipeline can carry different products

1. Co-mingling of products
2. Batching
3. Separation with a pig

604-7.2.3.3 Given an example of a pipeline, the hazardous materials technician shall identify the following:

1. Ownership of the line
2. Procedures for checking for gas migration
3. Procedure for shutting down the line or controlling the leak
4. Type of product in the line

604-7.2.3.4 Given examples of container stress or damage, the hazardous materials technician shall identify the type of damage in each example and assess the level of risk associated with the damage

1. Cracks

2. Scores
3. Gouges
4. Dents
5. Wheel burn
6. Rail burn
7. Street burn

604-7.2.3.5 Given a scenario involving radioactive materials, the hazardous materials technician, using available survey and monitoring equipment, shall determine if the integrity of any container has been breached

604-7.2.4 **Predicting Likely Behavior of Materials and Their Containers Where Multiple Materials Are Involved**

Given examples of hazardous materials/WMD incidents involving multiple hazardous materials or WMD, the hazardous materials technician shall predict the likely behavior of the material in each case and meet the requirements of 7.2.4.1 through 7.2.4.3

604-7.2.4.1 The hazardous materials technician shall identify at least three resources available that indicate the effects of mixing various hazardous materials

1. Richard J. Lewis, Jr., *Hazardous Chemicals Desk Reference*
2. NOAA (National Oceanic Atmospheric Administration) Chemical Reactivity Worksheet
3. Bretherick's *Handbook of Reactive Chemical Hazards*
4. NFPA *Fire Protection Guide on Hazardous Materials*
5. Material Safety Data Sheets

604-7.2.4.2 The hazardous materials technician shall identify the impact of the following fire and safety features on the behavior of the products during an incident at a bulk liquid facility and explain their significance in the analysis process:

1. Fire protection systems

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2. Monitoring and detection systems
3. Pressure relief and vacuum relief protection
4. Product spillage and control (impoundment and diking)
5. Tank spacing
6. Transfer operations

604-7.2.4.3 The hazardous materials technician shall identify the impact of the following fire and safety features on the behavior of the products during an incident at a bulk gas facility and explain their significance in the analysis process:

1. Fire protection systems
2. Monitoring and detection systems
3. Pressure relief protection
4. Transfer operations

604-7.2.5 **Estimating the Likely Size of an Endangered Area**

Given examples of hazardous materials/WMD incidents, the hazardous materials technician shall estimate the likely size, shape, and concentrations associated with the release of materials involved in an incident by using computer modeling, monitoring equipment, or specialists in this field and shall meet the requirements of 7.2.5.1 through 7.2.5.4

604-7.2.5.1 Given the emergency response plan, the hazardous materials technician shall identify resources for dispersion pattern prediction and modeling, including computers, monitoring equipment, or specialists in the field

604-7.2.5.2 Given the quantity, concentration, and release rate of a material, the hazardous materials technician shall identify the steps for determining the likely extent of the physical, safety, and health hazards within the endangered area of a hazardous materials/WMD incident

604-7.2.5.2.1 The hazardous materials technician shall describe the following terms and exposure values and explain their significance in the analysis process:

1. Counts per minute (cpm) and kilocounts per minute (kcpm)
2. Immediately dangerous to life and health (IDLH) value
3. Incubation period
4. Infectious dose
5. Lethal concentrations (LC₅₀)
6. Lethal dose (LD₅₀)
7. Parts per billion (ppb)
8. Parts per million (ppm)
9. Permissible exposure limit (PEL)
10. Radiation absorbed dose (rad)
11. Roentgen equivalent man (rem), millirem (mrem), microrem (μ rem)
12. Threshold limit value ceiling (TLV-C)
13. Threshold limit value short-term exposure limit (TLV-STEL)
14. Threshold limit value time-weighted average (TLV-TWA)
15. Health Hazard = Exposure + Toxicity
16. Dose = Concentration x Time
17. ALARA = As Low As Reasonably Achievable

604-7.2.5.2.2 The hazardous materials technician shall identify two methods for predicting the areas of potential harm within the endangered area of a hazardous materials/WMD incident

1. Determine the level of toxicity of the hazardous material that has been released in the endangered area
2. Determine the length of time that persons in the endangered area would be exposed to the hazard

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3. Determine areas of potential harm using reference sources or direct monitoring instruments
 - a. *Emergency Response Guidebook*
 - b. Computer dispersion models
 - i. CAMEO (Computer Assisted Management of Emergency Operations)
 - ii. MARPLOT (Mapping Applications for Response, Planning and Local Operational Tasks)
 - iii. ALOHA (Aerial Locations Of Hazardous Atmospheres)
 - iv. WISER (Wireless Informational Systems for Emergency Responders)
 - c. Portable and fixed air-monitoring systems

604-7.2.5.3 The hazardous materials technician shall identify the steps for estimating the outcomes within an endangered area of a hazardous materials/WMD incident

1. Determining the dimensions of the endangered area
2. Estimating the number of exposures within the endangered area
3. Measuring or predicting the concentrations of materials in the endangered area
4. Estimating the physical, health, and safety hazards within the endangered area
5. Identifying the area of potential harm within the endangered area
6. Estimating the potential outcomes within the endangered area

604-7.2.5.4 Given three examples involving a hazardous materials/WMD release and the corresponding instrument monitoring readings, the hazardous materials technician shall determine the applicable public protective response options and the areas to be protected

604-7.3 **Competencies — Planning the Response**

604-7.3.1 **Identifying Response Objectives**

604-7.3.1.1 Given scenarios involving hazardous materials/WMD incidents, the hazardous materials technician shall describe the response objectives for each problem

604-7.3.1.2 Given an analysis of a hazardous materials/WMD incident, the hazardous materials technician shall be able to describe the steps for determining response objectives (defensive, offensive, and nonintervention)

1. Estimate exposures that could be saved
2. Determine the response objectives

604-7.3.2 **Identifying the Potential Response Options**

604-7.3.2.1 Given scenarios involving hazardous materials/WMD incidents, the hazardous materials technician shall identify the possible response options (defensive, offensive, and nonintervention) by response objective for each problem

1. Offensive
 - a. Rescue
 - b. Public Protective Actions
 - c. Spill Control
 - d. Leak Control
 - e. Fire Control
 - f. Clean up and recovery
2. Defensive
 - a. Public Protective Actions
 - b. Spill Control
 - c. Fire Control
 - d. Clean up and recovery

3. Non intervention - Public Protective Actions

604-7.3.2.2 The hazardous materials technician shall be able to identify the possible response options to accomplish a given response objective.

The hazardous materials technician shall be able to identify concerns associated with the following event stages of the General Hazardous Materials Behavior Model:

1. Stress event
 - a. Thermal stress
 - b. Mechanical stress
 - c. Chemical stress
2. Breach event

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- a. Disintegration
 - b. Runaway Cracking
 - c. Failure of Container Attachments
 - d. Container Punctures
 - e. Container Splits or Tears
3. Release event
- a. Detonation
 - b. Violent Rupture
 - c. Rapid Relief
 - d. Spills or Leaks
4. Engulfing event
- a. Identify the hazardous material or the energy likely to engulf the area
 - b. What form is the energy or matter in?
 - c. What is making it move?
 - d. What path will it follow?
 - e. What type of dispersion pattern will it create?
 - i. Cloud
 - ii. Cone
 - iii. Plume
 - iv. Stream
 - v. Irregular
5. Impingement event (typically categorized based on duration)
- a. Harmful characteristics of material
 - b. Concentration of the hazardous material
 - c. Duration of the impingement
 - d. Characteristics of the exposure
6. Harm event
- a. Thermal
 - b. Toxicity/poison
 - c. Radiation
 - d. Asphyxiation
 - e. Corrosivity
 - f. Etiological
 - g. Mechanical

604-7.3.3

Selecting Personal Protective Equipment

Given scenarios of hazardous materials/WMD incidents with known and unknown hazardous materials/WMD, the hazardous materials technician shall determine the personal protective equipment for the

response options specified in the incident action plan in each situation and shall meet the requirements of 7.3.3.1 through 7.3.3.4.7

604-7.3.3.1

The hazardous materials technician shall identify and describe the four levels of personal protective equipment as specified by the Environmental Protection Agency (EPA) and the National Institute for Occupational Safety and Health (NIOSH)

1. Level A – Vapor Protective Chemical Protective Clothing (CPC)
 - a. Encapsulated garment
 - b. Requires SCBA (positive pressure self contained breathing apparatus) or SAR (supplied air respirator) use
2. Level B – Splash Protective CPC
 - a. Encapsulated garment
 - b. Non-encapsulated garment
 - c. Requires SCBA or SAR use
3. Level C – Splash Protective CPC
 - a. Non-encapsulated garment
 - b. Utilizes APR (air purifying respirator) or PAPR (powered air purifying respirator)
4. Level D – Non-emergency/hazardous materials response work clothing
5. Chemical protective clothing for Level A, Level B or Level C ensembles should be selected based on one of the following applicable criteria:
 - a. NFPA 1991 *Standard on Vapor Protective Ensembles for Hazardous Materials Emergencies*
 - b. NFPA 1992 *Standard on Liquid Splash Protective Ensembles and Clothing for Hazardous Materials Emergencies*
 - c. NFPA 1994 *Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents*

604-7.3.3.2

The hazardous materials technician shall identify and describe personal protective equipment options available for the following hazards:

1. Thermal
2. Radiological

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3. Asphyxiating
4. Chemical (liquids and vapors)
5. Etiological (biological)
6. Mechanical (explosives)

604-7.3.3.3 The hazardous materials technician shall identify the process to be considered in selecting respiratory protection for a specified action option

1. IDLH environments
 - a. Toxic environments
 - b. Flammable/explosive environments
 - c. Hazardous oxygen levels
 - d. Radiation exposure
2. Non-IDLH Atmospheres
 - a. Toxic environments
 - b. Flammable/explosive environments
 - c. Hazardous oxygen levels
 - d. Radiation exposure

604-7.3.3.4 The hazardous materials technician shall identify the factors to be considered in selecting chemical-protective clothing for a specified action option

604-7.3.3.4.1 The hazardous materials technician shall describe the following terms and explain their impact and significance on the selection of chemical-protective clothing:

1. Degradation
2. Penetration
3. Permeation

604-7.3.3.4.2 The hazardous materials technician shall identify at least three indications of material degradation of chemical-protective clothing

1. Stiffness or excessive pliability
2. Tears, cuts or abrasions

3. Damage to zippers or other closures

604-7.3.3.4.3 The hazardous materials technician shall identify the different designs of vapor-protective and splash-protective clothing and describe the advantages and disadvantages of each type

1. Type I
 - a. Fully encapsulating air tight vapor protective suit
 - b. With SCBA
2. Type II
 - a. Non-encapsulating suit
 - b. With SCBA worn on outside
3. Type III
 - a. Fully encapsulating suit
 - b. With SAR

604-7.3.3.4.4 The hazardous materials technician shall identify the relative advantages and disadvantages of the following heat exchange units used for the cooling of personnel in personal protective equipment:

1. Air cooled
2. Ice cooled
3. Water cooled
4. Phase change cooling technology

604-7.3.3.4.5 The hazardous materials technician shall identify the process for selecting protective clothing at hazardous materials/WMD incidents

1. Perform site management control functions
2. Identify the problem
3. Perform hazard and risk analysis
4. Consult PPE compatibility charts and respiratory protection guidelines
5. Select appropriate PPE based on the above

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- 604-7.3.3.4.6** Given three examples of various hazardous materials, the hazardous materials technician shall determine the protective clothing construction materials for a given action option using chemical compatibility charts
- 604-7.3.3.4.7** The hazardous materials technician shall identify the physiological and psychological stresses that can affect users of personal protective equipment
1. Physiological
 - a. Extreme heat or cold operating conditions
 - b. Noise
 - c. Reduced vision from fogging of CPC or SCBA face pieces
 - d. Operations in low-light or low-visibility environments
 - e. Reduced handling and dexterity due to the need to wear several layers of gloves
 - f. Adverse weather conditions
 - g. Physical hazards and the physical operating environment
 2. Psychological
 - a. Lack of physical fitness and the physical ability to perform the required tasks
 - b. Response operations involving injuries, fatalities or high-risk operations
 - c. Operations within enclosed or confined space environments
 - d. Background and experience levels in both wearing CPC and operating in hostile environments
 - e. Fear of either suit or respiratory protection failure

604-7.3.4

Selecting Decontamination Procedures

Given a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall select a decontamination procedure that will minimize the hazard, shall determine the equipment required to implement that procedure, and shall complete the following tasks:

1. Describe the advantages and limitations of each of the following decontamination methods:
 - a. Absorption
 - b. Adsorption
 - c. Chemical degradation
 - d. Dilution
 - e. Disinfecting
 - f. Evaporation
 - g. Isolation and disposal

- h. Neutralization
 - i. Solidification
 - j. Sterilization
 - k. Vacuuming
 - l. Washing
2. Identify three sources of information for determining the applicable decontamination procedure and identify how to access those resources in a hazardous materials/WMD incident
 - a. CHEMTREC
 - b. CHEM-TEL
 - c. Manufacturer
 - d. MSDS
 - e. National Response Center (NRC)
 - f. CANUTEC
 - g. SETIQ
 - h. Local or regional poison control centers

604-7.3.5

Developing a Plan of Action

Given scenarios involving hazardous materials/WMD incidents, the hazardous materials technician shall develop a plan of action, including site safety and a control plan, that is consistent with the emergency response plan and standard operating procedures and within the capability of available personnel, personal protective equipment, and control equipment for that incident, and shall meet the requirements of 7.3.5.1 through 7.3.5.5

A typical plan of action for a hazardous materials response would contain the following components:

1. Site description
2. Entry objective
3. On scene organization and coordination
4. On scene control
5. Hazard evaluation
6. Personal protective equipment
7. On scene work assignments
8. Communications procedures

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9. Decontamination procedures
10. On scene safety and health considerations including designation of the safety officer, emergency medical care procedures, environmental monitoring, emergency procedures, and personnel monitoring

604-7.3.5.1 The hazardous materials technician shall describe the purpose of, procedures for, equipment required for, and safety precautions used with the following techniques for hazardous materials/WMD control:

1. Absorption
2. Adsorption
3. Blanketing
4. Covering
5. Damming
6. Diking
7. Dilution
8. Dispersion
9. Diversion
10. Fire suppression
11. Neutralization
 - a. For corrosive releases
 - i. Not for use on living tissue – use primarily on decon equipment or neutralize spills
 - ii. Process generates heat
 - iii. Final solution should be as close to pH 7 as possible
 - iv. pH disposal guidelines dependent on AHJ
 - b. For other chemical releases
 - i. Consult technical reference
 - ii. Process typically generates heat
 - iii. pH disposal guidelines dependent on AHJ
12. Overpacking

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13. Patching
14. Plugging
15. Pressure isolation and reduction (flaring; venting; vent and burn; isolation of valves, pumps, or energy sources)
16. Retention
17. Solidification
18. Transfer
19. Vapor control (dispersion, suppression)

604-7.3.5.2 Given a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall develop the site safety and control plan that must be included as part of the incident action plan

In accordance with 29 CFR 1910.120 site safety and control plans should address the following:

1. Analysis of hazards on the site and a risk analysis of those hazards
2. Site map or sketch
3. Site work (control) zones
4. Use of buddy system
5. Site communications
6. Command post
7. Standard operating procedures and safe work practices
8. Medical Assistance and triage area
9. Other relevant topics

604-7.3.5.2.1 The hazardous materials technician shall list and describe the safety considerations to be included

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604-7.3.5.2.2 The hazardous materials technician shall identify the points that should be made in a safety briefing prior to working at the scene

604-7.3.5.3 The hazardous materials technician shall identify the atmospheric and physical safety hazards associated with hazardous materials/WMD incidents involving confined spaces

Hazards associated with confined spaces that should continually be monitored include but are not limited to:

1. Atmospheric hazards
 - a. Oxygen deficient
 - b. Oxygen enriched
 - c. Flammable/explosive
 - d. Toxic
2. Physical hazards
 - a. Engulfment
 - b. Slips/falls
 - c. Electrical
 - d. Structural
 - e. Mechanical

604-7.3.5.4 The hazardous materials technician shall identify the pre-entry activities to be performed.

1. Initial activities would include:
 - a. Establish command
 - b. Appoint a Safety Officer
 - c. Establish hazard control zones
 - d. Identify escape routes
 - e. Designate a withdrawal signal
 - f. Identify safe locations (uphill, upwind, up stream)
2. Develop Incident Action Plan
3. Identify hazards
4. Prior to entry into a hazard area the following tasks should be complete:
 - a. Establish entry team(s) and back up team(s)
 - b. Conduct site safety briefing
 - c. Designate primary and emergency modes of communication
 - d. Establish decon corridor
 - e. Identification of task(s) to be performed

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- f. Identification of personal protective equipment/respiratory protection
- g. Monitoring requirements

604-7.3.5.5

The hazardous materials technician shall identify the procedures, equipment, and safety precautions for preserving and collecting legal evidence at hazardous materials /WMD incidents

1. Evidence should be collected in accordance with AHJ.
2. All evidence collected must be appropriately documented and chain of custody maintained in accordance with AHJ.
3. Proper PPE must be utilized during collection process.

604-7.4

Competencies — Implementing the Planned Response

604-7.4.1

Performing Incident Command Duties

Given the emergency response plan or standard operating procedures and a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall demonstrate the duties of an assigned function in the hazardous materials branch or group within the incident command system and shall identify the role of the hazardous materials technician during hazardous materials/WMD incidents

1. Primary hazardous materials group or branch functions include:
 - a. Hazardous materials branch/group supervision (Hazardous Materials Branch Director/Group Supervisor)
 - b. Safety (Assistant Safety Officer – Hazardous Materials)
 - c. Site Access Control (Site Access Control Unit Leader)
 - i. Establishes Hazard Control Zones
 - ii. Manages Safe Refuge Area
 - d. Entry Team Operations (Entry Team Leader)
 - i. Recon team
 - ii. Entry team(s)
 - iii. Back-up team
 - e. Decontamination (Decon Team Leader)
 - f. Information/research coordination (Information/Research Team Leader)
 - i. Technical/Product Specialist
 - ii. Environmental/Remediation Contractors
 - iii. Governmental or External Agency Liaisons
2. Secondary hazardous materials group or branch functions include:

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- a. Resources/logistics
- b. Medical (Medical Unit Leader)
- c. Incident rehabilitation (Rehabilitation Unit Leader)
- d. The above secondary functions are performed by the Hazardous Materials Branch/Group only if they are not being performed by the logistics section, i.e., logistics section has not been activated

604-7.4.2 **Using Protective Clothing and Respiratory Protection**

The hazardous materials technician shall demonstrate the ability to don, work in, and doff liquid splash-protective, vapor-protective, and chemical-protective clothing and any other specialized personal protective equipment provided by the AHJ, including respiratory protection, and shall complete the following tasks:

1. Describe three safety procedures for personnel working in chemical-protective clothing
2. Describe three emergency procedures for personnel working in chemical-protective clothing
 - a. Loss of air supply
 - b. Loss of suit integrity
 - c. Loss of verbal communications
 - d. Victim/responder down in hazard area
3. Demonstrate the ability to don, work in, and doff self-contained breathing apparatus in addition to any other respiratory protection provided by the AHJ
4. Demonstrate the ability to don, work in, and doff liquid splash-protective, vapor-protective, and chemical-protective clothing in addition to any other specialized protective equipment provided by the AHJ

604-7.4.3 **Performing Control Functions Identified in Incident Action Plan.**

Given scenarios involving hazardous materials/WMD incidents, the hazardous materials technician shall select the tools, equipment, and materials for the control of hazardous materials/WMD incidents and identify the precautions for controlling releases from the packaging/containers and shall complete the following tasks:

1. Given a pressure vessel, select the material or equipment and demonstrate a method(s) to contain leaks from the following locations:
 - a. Fusible plug

- b. Fusible plug threads
 - c. Side wall of cylinder
 - d. Valve blowout
 - e. Valve gland
 - f. Valve inlet threads
 - g. Valve seat
 - h. Valve stem assembly blowout
2. Given the fittings on a pressure container, demonstrate the ability to perform the following:
 - a. Close valves that are open
 - b. Replace missing plugs
 - c. Tighten loose plugs
3. Given a 55 gal (208 L) drum and applicable tools and materials, demonstrate the ability to contain the following types of leaks:
 - a. Bung leak
 - b. Chime leak
 - c. Forklift puncture
 - d. Nail puncture
4. Given a 55 gal (208 L) drum and an overpack drum, demonstrate the ability to place the 55 gal (208 L) drum into the overpack drum using the following methods:
 - a. Rolling slide-in
 - b. Slide-in
 - c. Slip-over
5. Identify the maintenance and inspection procedures for the tools and equipment provided for the control of hazardous materials releases according to the manufacturer's specifications and recommendations
6. Identify three considerations for assessing a leak or spill inside a confined space without entering the area.

Use remote monitoring to evaluate for:

 - a. Oxygen levels
 - b. Flammable atmospheres
 - c. Toxic atmospheres
7. Identify three safety considerations for product transfer operations
 - a. Grounding
 - b. Bonding
 - c. Elimination of ignition sources and shock hazards

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8. Given an MC-306/DOT-406 cargo tank and a dome cover clamp, demonstrate the ability to install the clamp on the dome
9. Identify the methods and precautions used to control a fire involving an MC-306/DOT-406 aluminum shell cargo tank
10. Describe at least one method for containing each of the following types of leaks in MC-306/DOT-406, MC-307/DOT-407, and MC-312/DOT-412 cargo tanks:
 - a. Dome cover leak
 - b. Irregular-shaped hole
 - c. Puncture
 - d. Split or tear
11. Describe three product removal and transfer considerations for overturned MC-306/DOT-406, MC-307/DOT-407, MC-312/DOT-412, MC-331, and MC-338 cargo tanks
 - a. Inherent risks associated with such operations
 - b. Procedures and safety precautions
 - c. Equipment required

604-7.4.4 Given MC-306/DOT-406, MC-307/DOT-407, MC-312/DOT-412, MC-331, and MC-338 cargo tanks, the hazardous materials technician shall identify the common methods for product transfer from each type of cargo tank.

604-7.4.5 **Performing Decontamination Operations Identified in the Incident Action Plan.**

The hazardous materials technician shall demonstrate the ability to set up and implement the following types of decontamination operations:

1. Technical decontamination operations in support of entry operations
2. Technical decontamination operations involving ambulatory and non-ambulatory victims
3. Mass decontamination operations involving ambulatory and non-ambulatory victims

604-7.5 **Competencies — Evaluating Progress**

604-7.5.1 **Evaluating the Effectiveness of the Control Functions**

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Given scenarios involving hazardous materials/WMD incidents and the incident action plan, the hazardous materials technician shall evaluate the effectiveness of any control functions identified in the incident action plan.

604-7.5.2 **Evaluating the Effectiveness of the Decontamination Process**

Given an incident action plan for a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall evaluate the effectiveness of any decontamination procedures identified in the incident action plan.

604-7.6 **Competencies — Terminating the Incident**

604-7.6.1 **Assisting in the Debriefing**

Given a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall participate in the debriefing of the incident and shall meet the following requirements:

An effective debriefing should address the following informational issues regarding response activities:

- Positive aspects – Identify strengths or things that went well that need to be maintained or continued
 - Negative aspects – Identify weaknesses that went poorly and need to be corrected
 - Unique aspects – Unusual or unsuspected conditions that may need to be addressed or planned for
1. Describe (at least) three components of an effective debriefing
 - a. Inform responders of the potential signs and symptoms of any possible hazardous materials exposures
 - b. Identify:
 - i. Damaged equipment
 - ii. Expended supplies
 - iii. Items that need to be disposed
 - iv. Unsafe site conditions
 - c. Assign:
 - i. information gathering responsibilities for a post-incident analysis and critique
 - ii. Point of contact for any follow up on incident related issues
 - d. Assess the need for Critical Incident Stress Debriefing (CISD)
 2. Describe the key topics of an effective debriefing
 - a. Health information

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- b. Equipment and apparatus exposure review
 - c. A follow-up contact person
 - d. Problems requiring immediate action
 - e. Thank you!
3. Describe when a debriefing should take place
 - a. As soon as the “emergency phase” of the incident is over
 - b. Should be before any responders leave the scene
 4. Describe who should be involved in a debriefing.
 - a. Hazardous Materials Response Team
 - b. Incident Commander
 - c. Section Chiefs/Branch Directors/Division and Group Supervisors, etc.
 - d. Information Officer
 - e. Agency representatives or key players as determined by the Incident Commander (i.e. Safety Officer and Agency Liaisons)

604-7.6.2

Assisting in the Incident Critique

Given a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall provide operational observations of the activities that were performed in the hot and warm zones during the incident and shall complete the following tasks:

1. Describe three components of an effective critique
 - a. Direction
 - b. Participation
 - c. Solutions
2. Describe who should be involved in a critique
 - a. Hazardous Materials Response Team
 - b. Incident Commander
 - c. Section Chiefs/Branch Directors/Division and Group Supervisors, etc.
 - d. Information Officer
 - e. Agency representatives or key players as determined by the Incident Commander (i.e. Safety Officer and Agency Liaisons)
3. Describe why an effective critique is necessary after a hazardous materials/WMD incident
 - a. Develop recommendations for improving the emergency response team

- b. Promotes systems-dependent operations rather than people-dependent organizations
 - c. Promotes a willingness to cooperate through teamwork
 - d. Promotes improvement of safe operating procedures
 - e. Promotes sharing of information among emergency response organizations
4. Describe which written documents should be prepared as a result of the critique
 - a. Post-Critique Report
 - b. Formal-Critique Report
5. Describe recommended methods for critiquing large-scale emergency responses
 - a. Participant-level critique
 - b. Operations-level critique
 - c. Group-level critique

604-7.6.3

Reporting and Documenting the Incident

Given a scenario involving a hazardous materials/WMD incident, the hazardous materials technician shall complete the reporting and documentation requirements consistent with the emergency response plan or standard operating procedures and shall meet the following requirements:

1. Identify the reports and supporting documentation required by the emergency response plan or standard operating procedures
2. Demonstrate completion of the reports required by the emergency response plan or standard operating procedures
 - a. Incident action plan and all components
 - b. Site safety plan and all components
 - c. Other documentation required by AHJ
3. Describe the importance of personnel exposure records
4. Describe the importance of debriefing records
5. Describe the importance of critique records
6. Identify the steps in keeping an activity log and exposure records
 - a. Activity log
 - i. Record major event(s)
 - ii. Record time major event(s) occurred
 - iii. Briefly describe major event(s)

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- iv. Additional information to include
 - a) Information that may assist in the investigation or cost recovery process
 - b) Task assignments
 - c) Task completion
 - d) Injuries and exposures
 - b. Exposure records
 - i. General information
 - a) Name of exposed worker
 - b) Personal ID number
 - c) Assignment/station
 - d) Incident date
 - e) Incident number
 - f) Incident location
 - ii. Nature of incident
 - iii. Level of personal protection
 - iv. Emergency response activity
 - v. Exposure data
 - a) Method of exposure
 - b) Duration of exposure
 - vi. Medical treatment provided
 - a) Signs and symptoms
 - b) On-scene medical treatment
 - c) Medical facility treatment
 - d) Follow-up action required
 - vii. Medical treatment provided
 - a) Comment section
 - b) Individual's signature and date
 - c) Officer's signature and date
7. Identify the steps to be taken in compiling incident reports that meet federal, state, local, and organizational requirements – AHJ
8. Identify the requirements for compiling hot zone entry and exit logs – AHJ
9. Identify the requirements for compiling personal protective equipment logs
- The compilation of personal protective equipment logs should follow the PPE manufacturer's recommended procedures and any additional guidance from the AHJ (Regulations, SOPs, SOGs, etc.).
10. Identify the requirements for filing documents and maintaining records – AHJ

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REFERENCE LIST FOR THE HAZARDOUS MATERIALS AWARENESS CURRICULA

This Reference List is provided as a general guide for both instructors and students to locate information pertaining to the specific objectives in the TCFP Curriculum. This list is **not** all-inclusive and does not in any way limit TCFP development and use of questions to test the objectives of the curriculum:

Required References

Texts

- Code of Federal Regulations, Title 29 Part 1910.120, Appendix A.* United States. U.S. Department of Labor, Occupational Safety & Health Administration.
http://edocket.access.gpo.gov/cfr_2007/julqtr/pdf/29cfr1910.120.pdf
- Certification Curriculum Manual.* Texas Commission on Fire Protection. (Most current edition). Austin, TX: Texas Commission on Fire Protection.
- Emergency Response Guidebook.* United States. (Most current edition). Washington, DC: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration.
- Essentials of Fire Fighting, 5th edition.* International Fire Service Training Association. (2008). Stillwater, OK: Fire Protection Publications, Oklahoma State University.
- Firefighter's Handbook: Essentials of Firefighting and Emergency Response, 3^d edition.* Delmar Publishers. (2008). Clifton Park, NY: Delmar, Cengage Learning.
- Fundamentals of Fire Fighter Skills, 2nd edition.* International Association of Fire Chiefs, & National Fire Protection Association. (2008). Sudbury, MA: Jones and Bartlett.
- Hazardous Materials Awareness and Operations.* DeBobes, L. J. (2009). Sudbury, MA: Jones & Bartlett.
- Hazardous Materials for First Responders, 3^d edition.* Adams, B., & Miller, L. A. (2004). Stillwater, OK: Fire Protection Publications, Oklahoma State University.
- Hazardous Materials Handbook: Awareness and Operations Levels.* Hawley, C., & Walter, A. (2008). Clifton Park, NY: Delmar, Cengage Learning.
- Hazardous Materials/Weapons of Mass Destruction Response Handbook, 5th edition.* Trebisacci, D. G. (2008). Quincy, MA: National Fire Protection Association.
- NFPA 472: Standard for Professional Competence of Responders to Hazardous Materials Incidents.* (2008 ed.). Quincy, MA: NFPA Publications. National Fire Protection Association
- Standards Manual for Fire Protection Personnel.* Texas Commission on Fire Protection. (Current edition). Austin, TX: Texas Commission on Fire Protection.

Recommended References

The most current edition of the following publications and media are recommended (not required) supplemental material for program use.

Texts

Hazardous Materials Field Guide, 2nd edition. Bevelacqua, A. S., & Stilp, R. H. (2007). Albany, NY: Delmar Publications.

Symbol Seeker: Hazard Identification Manual. Burns, P. P. (2002). Preston, England: Symbol Seeker.

Media

DOT Chart 13: Hazardous Materials Marking, Labeling and Placarding Guide. United States. (2007). Washington, DC: U.S. Dept. of Transportation, Pipeline and Hazardous Materials Safety Administration.

Emergency Response Guidebook 2008. [DVD]. United States. (2008). Washington, DC: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration.

Hazmat Awareness. Action Training Systems, Inc. (2008). [2 Disc DVD Set - Recognition & Identification]. Poulsbo, WA: Action Training Systems.

Hazardous Materials Awareness and Operations [DVD]. International Association of Fire Chiefs, & National Fire Protection Association. (2006). Sudbury, MA: Jones and Bartlett.

**CHAPTER 6
SECTION 601
HAZARDOUS MATERIALS AWARENESS
CURRICULUM OUTLINE**

SECTION	SUBJECT	RECOMMENDED HOURS
601-4.1	General - Introduction - Laws, Regulations, and National Consensus Standards	1
601-4.2	Analyzing the Incident	5
601-4.3	Planning the Response - Reserved - None Required at this Level	
601-4.4	Implementing the Planned Response	2
601-4.5	Evaluating Progress - Reserved - None Required at this Level	
601-4.6	Terminating the Incident - Reserved - None Required at this Level	
	TOTAL RECOMMENDED HOURS	8

The recommended hours include time for skills evaluation and are based on 12 students. Hours needed depend on the actual number of students.

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SECTION 601

HAZARDOUS MATERIALS AWARENESS

Awareness Level Personnel are those who, in the course of their normal duties, may encounter an emergency incident involving hazardous materials/weapons of mass destruction (WMD) and who are expected to:

- Recognize the presence of the hazardous materials/weapons of mass destruction (WMD),
- Protect themselves,
- Call for trained personnel, and
- Secure the scene

Response options for awareness level personnel are generally limited to nonintervention actions only.

601-4.1 General

601-4.1.1 Introduction

601-4.1.1.1 Awareness level personnel shall be persons who, in the course of their normal duties, could encounter an emergency involving hazardous materials/weapons of mass destruction (WMD) and who are expected to recognize the presence of the hazardous materials/WMD, protect themselves, call for trained personnel, and secure the area.

601-4.1.1.2 Awareness level personnel shall be trained to meet all competencies of this chapter.

601-4.1.1.3 Awareness level personnel shall receive additional training to meet applicable governmental occupational health and safety regulations.

1. Occupational training requirements
 - a. Firefighter
 - b. Peace officer
 - c. Emergency medical services
 - d. Other
2. Safety regulations
 - a. OSHA
 - b. EPA
 - c. DOT
 - d. Other

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601-4.1.2 **Goal**

601-4.1.2.1 The goal of the competencies at the awareness level shall be to provide personnel already on the scene of a hazardous materials/WMD incident with the knowledge and skills to perform the tasks in 4.1.2.2 safely and effectively.

601-4.1.2.2 When already on the scene of a hazardous materials/WMD incident, the awareness level personnel shall be able to perform the following tasks:

1. Analyze the incident to determine both the hazardous material/WMD present and the basic hazard and response information for each hazardous material/WMD agent by completing the following tasks:
 - a. Detect the presence of hazardous materials/WMD.
 - b. Survey a hazardous materials/WMD incident from a safe location to identify the name, UN/NA identification number, type of placard, or other distinctive marking applied for the hazardous materials/WMD involved.
 - c. Collect hazard information from the current edition of the DOT *Emergency Response Guidebook*.
2. Implement actions consistent with the emergency response plan, the standard operating procedures, and the current edition of the DOT *Emergency Response Guidebook* by completing the following tasks:
 - a. Initiate protective actions.
 - b. Initiate the notification process.

601-4.2 **Competencies — Analyzing the Incident**

601-4.2.1 **Detecting the Presence of Hazardous Materials/WMD**

Given examples of various situations, awareness level personnel shall identify those situations where hazardous materials/WMD are present and shall meet the following requirements:

1. Identify the definitions of both *hazardous material* (or *dangerous goods*, in Canada) and *WMD*.
 - a. Hazardous materials (or dangerous goods in Canada) – a substance (solid, liquid, gas or energy) that when released is capable of creating harm to people, the environment, and property, including weapons of mass destruction (WMD) as defined in 18 U.S. Code, Section 2332a, as well as any other criminal use of hazardous materials, such as illicit labs, environmental crimes, or industrial sabotage

- b. Weapons of Mass Destruction (WMD) - (1) Any destructive device, such as any explosive, incendiary, or poison gas bomb, grenade, rocket having a propellant charge of more than four ounces, missile having an explosive or incendiary charge of more than one quarter ounce (7 grams), mine, or device similar to the above; (2) any weapon involving toxic or poisonous chemicals; (3) any weapon involving a disease organism; or (4) any weapon that is designed to release radiation or radioactivity at a level dangerous to human life.
2. Identify the UN/DOT hazard classes and divisions of hazardous materials/WMD and identify common examples of materials in each hazard class or division.
 - a. Class 1 – Explosives
 - i. Division 1.1 Explosives with a mass explosion hazard. Examples of Division 1.1 explosives include black powder trinitrotoluene, dynamite, and trinitrotoluene (TNT).
 - ii. Division 1.2 Explosives with a projection hazard. Examples of Division 1.2 explosives include aerial flares, detonating cord, and power device cartridges.
 - iii. Division 1.3 Explosives with predominantly a fire hazard. Examples of Division 1.3 explosives include liquid-fueled rocket motors and propellant explosives.
 - iv. Division 1.4 Explosives with no significant blast hazard. Examples of Division 1.4 explosives include line-throwing rockets, practice ammunition, and signal cartridges.
 - v. Division 1.5 Very insensitive explosives with a mass explosion hazard. Examples of Division 1.5 explosives include piled ammonium nitrate fertilizer–fuel oil mixtures (blasting agents).
 - vi. Division 1.6 Extremely insensitive articles. An example of Division 1.6 includes wetted cellulose nitrate.
 - b. Class 2 - Gases
 - i. Division 2.1 Flammable gases. Examples of Division 2.1 gases include inhibited butadienes, methyl chloride, and propane.
 - ii. Division 2.2 Non-flammable, non-toxic gases. Examples of Division 2.2 gases include anhydrous ammonia, cryogenic argon, carbon dioxide, and compressed nitrogen.
 - iii. Division 2.3 Toxic gases. Examples of Division 2.3 gases include anhydrous hydrogen fluoride, arsine, chlorine, and methyl bromide.

- c. Class 3 - Flammable liquids (and Combustible liquids [U.S.])
Examples of Class 3 liquids include acetone, amyl acetate, gasoline, methyl alcohol, and toluene.
 - d. Class 4 - Flammable solids; Spontaneously combustible materials; and Dangerous when wet materials/Water-reactive substances
 - i. Division 4.1 Flammable solids. Examples of Division 4.1 materials include magnesium (pellets, turnings, or ribbons) and nitrocellulose.
 - ii. Division 4.2 Spontaneously combustible materials. Examples of Division 4.2 materials include aluminum alkyls, charcoal briquettes, magnesium alkyls, and phosphorus.
 - iii. Division 4.3 Water-reactive substances/Dangerous when wet materials. Examples of Division 4.3 materials include calcium carbide, magnesium powder, potassium metal alloys, and sodium hydride.
 - e. Class 5 - Oxidizing substances and Organic peroxides
 - i. Division 5.1 Oxidizing substances. Examples of Division 5.1 materials include ammonium nitrate, bromine trifluoride, and calcium hypochlorite.
 - ii. Division 5.2 Organic peroxides. Examples of Division 5.2 materials include dibenzoyl peroxide, methyl ethyl ketone peroxide, and peroxyacetic acid.
 - f. Class 6 - Toxic substances and Infectious substances
 - i. Division 6.1 Toxic substances. Examples of Division 6.1 materials include aniline, arsenic compounds, carbon tetrachloride, hydrocyanic acid, and tear gas.
 - ii. Division 6.2 Infectious substances. Examples of Division 6.2 materials include anthrax, botulism, rabies, and tetanus.
 - g. Class 7 - Radioactive materials. Examples of Class 7 materials include cobalt, uranium hexafluoride, and "yellow cake."
 - h. Class 8 - Corrosive substances. Examples of Class 8 materials include nitric acid, phosphorus trichloride, sodium hydroxide, and sulfuric acid.
 - i. Class 9 - Miscellaneous hazardous materials/Products, Substances or Organisms. Examples of Class 9 materials include adipic acid, hazardous substances (e.g., PCBs), and molten sulfur.
3. Identify the primary hazards associated with each UN/DOT hazard class and division.
- i. Class 1 — Explosives

An explosive is any substance or article, including a device, that is designed to function by explosion (i.e., an extremely rapid release of gas and heat) or that, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion. Explosives in Class 1 are divided into six divisions. Each division has a letter designation.

- i. Division 1.1 consists of explosives that have a mass explosion hazard. A mass explosion is one that affects almost the entire load instantaneously.
 - ii. Division 1.2 consists of explosives that have a projection hazard but not a mass explosion hazard.
 - iii. Division 1.3 consists of explosives that have a fire hazard and a minor blast hazard, a minor projection hazard, or both, but not a mass explosion hazard.
 - iv. Division 1.4 consists of explosive devices that present a minor explosion hazard. No device in the division can contain more than 0.9 oz (25 g) of a detonating material. The explosive effects are largely confined to the package, and no projection of fragments of appreciable size or range are expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.
 - v. Division 1.5 consists of very insensitive explosives. This division comprises substances that have a mass explosion hazard but are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.
 - vi. Division 1.6 consists of extremely insensitive articles that do not have a mass explosive hazard. This division comprises articles that contain only extremely insensitive detonating substances and that demonstrate a negligible probability of accidental initiation or propagation.
- ii. Class 2 — Gases
- i. Division 2.1 (flammable gas) consists of materials that are a gas at 68°F (20°C) or less and 14.7 psi (101.3 kPa) of pressure, have a boiling point of 68°F (20°C) or less at 14.7 psi (101.3 kPa), and have the following properties:
 - a) Are ignitable at 14.7 psi (101.3 kPa) when in a mixture of 13 percent or less by volume with air
 - b) Have a flammable range at 14.7 psi (101.3 kPa) with air of at least 12 percent regardless of the lower limit
 - ii. Division 2.2 (nonflammable, nonpoisonous compressed gas, including compressed gas, liquefied gas, pressurized cryogenic gas, and compressed gas in

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solution, asphyxiant gas, and oxidizing gas) consists of materials (or mixtures) that exert in the packaging an absolute pressure of 41 psi (280 kPa) at 68°F (20°C). A cryogenic liquid is a refrigerated liquefied gas having a boiling point colder than -130°F (-90°C) at 14.7 psi (101.3 kPa).

- iii. Division 2.3 (gas poisonous by inhalation) consists of materials that are a gas at 68°F (20°C) or less and a pressure of 14.7 psi, or 1 atm (101.3 kPa), have a boiling point of 68°F (20°C) or less at 14.7 psi (101.3 kPa), and have the following properties:
 - a) Are known to be so toxic to humans as to pose a hazard to health during transportation
 - b) In the absence of adequate data on human toxicity, are presumed to be toxic to humans because, when tested on laboratory animals, they have an LC50 value of not more than 5000 ppm.
- iii. Class 3 — Flammable and Combustible Liquids
 - i. Flammable liquids are liquids having a flash point of not more than 140°F (60°C) or materials in a liquid phase with a flash point at or above 100°F (37.8°C) that are intentionally heated and offered for transportation or transported at or above their flash point in a bulk packaging. Examples of flammable liquids include gasoline, methyl ethyl ketone, and ethyl alcohol.
 - ii. Combustible liquids are liquids that do not meet the definition of any other hazard class and that have a flash point above 140°F (60°C) and below 200°F (93°C). Flammable liquids with a flash point above 100°F (38°C) can be reclassified as combustible liquids. Examples of combustible liquids include mineral oil, peanut oil, and No. 6 fuel oil.
- iv. Class 4 — Flammable Solids
 - i. Division 4.1 (flammable solids) comprised of the following three types of materials:
 - a) Desensitized explosives — explosives wetted with sufficient water, alcohol, or plasticizers to suppress explosive properties
 - b) Self-reactive materials — materials that are thermally unstable and that can undergo a strongly exothermic decomposition even with participation of oxygen (air)
 - c) Readily combustible solids — solids that can cause a fire through friction and any metal powders that can be ignited.

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- ii. Division 4.2 (spontaneously combustible material) comprises the following materials:
 - a) Pyrophoric materials — liquids or solids that, even in small quantities and without an external ignition source, can ignite within 5 minutes after coming in contact with air
 - b) Self-heating materials — materials that, when in contact with air and without an energy supply, are liable to self-heat
- iii. Division 4.3 (dangerous-when-wet materials) comprises of materials that, by contact with water, are liable to become spontaneously flammable or to give off flammable or toxic gas at a rate greater than 1 L/kg of the material per hour.
- v. Class 5 — Oxidizers and Organic Peroxides
 - i. Division 5.1 (oxidizers) comprises materials that can, generally by yielding oxygen, cause or enhance the combustion of other materials.
 - ii. Division 5.2 (organic peroxides) comprises organic compounds that contain oxygen (O) in the bivalent -O-O- structure that can be considered a derivative of hydrogen peroxide, where one or more of the hydrogen atoms have been replaced by organic radicals.
- vi. Class 6 — Poisonous Materials
 - i. Division 6.1 (poisonous materials) comprises materials other than gases that either are known to be so toxic to humans as to afford a hazard to health during transportation or in the absence of adequate data on human toxicity are presumed to be toxic to humans, including materials that cause irritation.
 - ii. Division 6.2 (infectious substances) comprises materials known to contain or suspected of containing a pathogen. A pathogen is a micro-organism (including viruses, plasmids, and other genetic elements) or a proteinaceous infectious particle (prion) that has the potential to cause disease in humans or animals. The terms *infectious substance* and *etiologic agent* are synonymous.
- vii. Class 7 — Radioactive Materials

Radioactive material is any material containing radionuclides where both the activity concentration and the total activity in the consignment exceed specified values.
- viii. Class 8 — Corrosive Materials

Corrosive materials are liquids or solids that cause full-thickness destruction of skin at the site of contact within a specified period of

time. A liquid that has a severe corrosion rate on steel or aluminum is also a corrosive material.

- ix. Class 9 — Miscellaneous Hazardous Materials
Miscellaneous hazardous materials are materials that present a hazard during transport but that do not meet the definition of any other hazard class. Miscellaneous hazardous materials include the following:
- i. Any material that has an anesthetic, noxious, or other similar property that could cause extreme annoyance or discomfort to a flight crew member so as to prevent the correct performance of assigned duties
 - ii. Any material that is not included in any other hazard class but that is subject to DOT requirements (e.g. elevated-temperature material, hazardous substance, hazardous waste, marine pollutant).
4. Identify the difference between hazardous materials/WMD incidents and other emergencies.
- a. Size
 - b. Complexity
 - c. Intent
 - d. Crime scene management
 - e. Secondary devices/attacks and armed
5. Identify typical occupancies and locations in the community where hazardous materials/WMD are manufactured, transported, stored, used, or disposed of.
6. Identify typical container shapes that can indicate the presence of hazardous materials/WMD.
- a. Non-bulk containers
 - b. Bulk containers
 - c. Fixed facility storage systems
 - d. Pipelines
 - e. Ships & marine vessels
7. Identify facility and transportation markings and colors that indicate hazardous materials/WMD, including the following:
- a. Transportation markings, including UN/NA identification number marks, marine pollutant mark, elevated temperature (HOT) mark, commodity marking, and inhalation hazard mark
 - b. NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, markings
 - c. Military hazardous materials/WMD markings

- d. Special hazard communication markings for each hazard class (i.e., Hazardous Material Identification System – HMIS)
 - e. Pipeline markings
 - f. Container markings
8. Given an NFPA 704 marking, describe the significance of the colors, numbers, and special symbols.
- a. Categories of hazards
 - i. Health – blue color
 - ii. Flammability – red color
 - iii. Reactivity – yellow color
 - iv. Special hazards (white color with symbol)
 - b. Five degrees of hazards (0 – 4)
9. Identify U.S. and Canadian placards and labels that indicate hazardous materials/WMD. (see ERG or DOT Chart)
10. Identify the following basic information on material safety data sheets (MSDS) and shipping papers for hazardous materials:
- a. Identify where to find MSDS.
 - b. Identify major sections of an MSDS.
 - i. Basic information that indicates hazardous materials
 - ii. Entries that indicate the presence of hazardous materials containers by their shape
 - c. Identify the entries on shipping papers that indicate the presence of hazardous materials.
 - d. Match the name of the shipping papers found in transportation (air, highway, rail, and water) with the mode of transportation.
 - i. Air – air bill
 - ii. Highway – Bill of Lading or freight bill
 - iii. Water – dangerous cargo manifest
 - iv. Rail – waybill and/or consist
 - e. Identify the person responsible for having the shipping papers in each mode of transportation.
 - f. Identify where the shipping papers are found in each mode of transportation.
 - g. Identify where the papers can be found in an emergency in each mode of transportation.
11. Identify examples of clues (other than occupancy/ location, container shape, markings/color, placards/ labels, MSDS, and shipping papers) the sight, sound, and odor of which indicate hazardous materials/WMD.
- a. Odors
 - b. Gas leak

- c. Fire
 - d. Vapor cloud
 - e. Corrosive actions
 - f. Visible chemical reactions
 - g. Pooled liquids
 - h. Sound of a pressure release
 - i. Condensation line on pressure tank
 - j. Injured persons or casualties
12. Describe the limitations of using the senses in determining the presence or absence of hazardous materials/WMD.
- a. Exposes responder to possible ill health effects; or
 - b. Death
13. Identify at least four types of locations that could be targets for criminal or terrorist activity using hazardous materials/WMD.
- a. Public assembly areas
 - b. Public building
 - c. Mass transit systems
 - d. Places with high economic impact
 - e. Telecommunications facilities
 - f. Places with historical or symbolic significance
 - g. Military installations
 - h. Airports
 - i. Industrial facilities
14. Describe the difference between a chemical and a biological incident.
- a. Chemical – characterized by rapid onset of symptoms
 - b. Biological – symptoms requires days or weeks to manifest
15. Identify at least four indicators of possible criminal or terrorist activity involving chemical agents.
- a. The presence of hazardous materials/WMD or laboratory equipment that is not relevant to the occupancy
 - b. Intentional release of hazardous materials/WMD
 - c. Unexplained patterns of sudden onset of similar, nontraumatic illnesses or deaths (patterns that might be geographic, by employer, or associated with agent dissemination methods)
 - d. Unexplained odors or tastes that are out of character with the surroundings
 - e. Multiple individuals exhibiting unexplained signs of skin, eye, or airway irritation
 - f. Unexplained bomb- or munitions-like material, especially if it contains a liquid
 - g. Unexplained vapor clouds, mists, and plumes

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- h. Multiple individuals exhibiting unexplained health problems such as nausea, vomiting, twitching, tightness in chest, sweating, pinpoint pupils (miosis), runny nose (rhinorrhea), disorientation, difficulty breathing, convulsions, or death
 - i. Trees, shrubs, bushes, food crops, and/or lawns that are dead, discolored, abnormal in appearance, or withered (not due to a current drought and not just a patch of dead weeds)
 - j. Surfaces exhibiting oily droplets/films and unexplained oily film on water surfaces
 - k. An abnormal number of sick or dead birds, animals, or fish
 - l. Unusual security, locks, bars on windows, covered windows, or barbed wire
16. Identify at least four indicators of possible criminal or terrorist activity involving biological agents.
- a. Unusual number of sick or dying people or animals (any number of symptoms; time before symptoms are observed dependent on the agent used but usually days to weeks)
 - b. Healthcare facilities reporting multiple casualties with similar signs or symptoms
 - c. Unscheduled or unusual spray being disseminated, especially if outdoors during period of darkness
 - d. Abandoned spray devices (devices with no distinct odors)
17. Identify at least four indicators of possible criminal or terrorist activity involving radiological agents.
- a. Radiation Symbols
 - b. Unusual metal debris
 - c. Heat-emitting material
 - d. Glowing material
 - e. Sick people/animals
18. Identify at least four indicators of possible criminal or terrorist activity involving illicit laboratories (e.g., clandestine laboratories, weapons lab, ricin lab).
- a. Structures with unusual or multiple vents
 - b. Buildings with heavy security
 - c. Obscured windows
 - d. Odd or unusual odors
 - e. May include mobile facilities, i.e. mobile meth labs
19. Identify at least four indicators of possible criminal or terrorist activity involving explosives
- a. Prior warning or threat of attack
 - b. Unknown explosions

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- c. Multiple fires or explosions
- d. Unattended packages, backpacks and other objects left in high traffic public areas
- e. Fragmentation damage or injuries
- f. Craters
- g. Small metal objects, i.e. nuts, bolts, nails used as shrapnel

20. Identify at least four indicators of secondary devices

- a. Containers with unknown liquids or materials
- b. Unusual devices or containers with electronic components such as wires, circuit boards, cellular phones, antennas and other items attached or exposed
- c. Devices containing quantities of fuses, fireworks, match heads, black powder, incendiary materials or other unusual materials
- d. Materials attached to or surrounding an item such as nails, bolts, drill bits that could be used for shrapnel
- e. Ordnance such as blasting caps, detcord, explosives, grenades, etc.

601-4.2.2 **Surveying Hazardous Materials/WMD Incidents**

Given examples of hazardous materials/WMD incidents, awareness level personnel shall, from a safe location, identify the hazardous material(s)/WMD involved in each situation by name, UN/NA identification number, or type placard applied and shall meet the following requirements:

1. Identify difficulties encountered in determining the specific names of hazardous materials/WMD at facilities and in transportation.
2. Identify sources for obtaining the names of, UN/NA identification numbers for, or types of placard associated with hazardous materials/WMD in transportation.
 - a. Shipping documents
 - b. Labels
 - c. Placards
 - d. DOT *Emergency Response Guidebook* (ERG)
3. Identify sources for obtaining the names of hazardous materials/WMD at a facility.
 - a. Shipping documents
 - b. Labels
 - c. Placards
 - d. ERG
 - e. Material Safety Data Sheets (MSDS)
 - f. Facility documents

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- g. Facility pre-plans

601-4.2.3 **Collecting Hazard Information**

Given the identity of various hazardous materials/WMD (name, UN/NA identification number, or type placard), awareness level personnel shall identify the fire, explosion, and health hazard information for each material by using the current edition of the DOT *Emergency Response Guidebook* and shall meet the following requirements:

1. Identify the three methods for determining the guidebook page for a hazardous material/WMD.
 - a. Locate UN number in the yellow-bordered pages
 - b. Locate name of material in the alphabetic listing in the blue-bordered pages
 - c. Locate a matching placard or container shape and consult the appropriate guide number
2. Identify the two general types of hazards found on each guidebook page.
 - a. Fire/explosive
 - b. Health

601-4.3 **Competencies — Planning the Response. (Reserved)**

601-4.4 **Competencies — Implementing the Planned Response**

601-4.4.1 **Initiating Protective Actions**

Given examples of hazardous materials/WMD incidents, the emergency response plan, the standard operating procedures, and the current edition of the DOT *Emergency Response Guidebook*, awareness level personnel shall be able to identify the actions to be taken to protect themselves and others and to control access to the scene and shall meet the following requirements:

1. Identify the location of both the emergency response plan and/or standard operating procedures.
2. Identify the role of the awareness level personnel during hazardous materials/WMD incidents.
 - a. Recognize the presence of hazardous materials/WMD.
 - b. Protect themselves
 - c. Call for trained personnel
 - d. Secure the area

3. Identify the following basic precautions to be taken to protect themselves and others in hazardous materials/WMD incidents:
 - a. Identify the precautions necessary when providing emergency medical care to victims of hazardous materials/WMD incidents.
 - i. Responder safety/appropriate PPE
 - ii. Isolate the victim
 - iii. Identify the product (by appropriately trained personnel)
 - iv. Decontaminate the patient (by appropriately trained personnel)
 - b. Identify typical ignition sources found at the scene of hazardous materials/WMD incidents.
 - c. Identify the ways hazardous materials/WMD are harmful to people, the environment, and property.
 - i. Thermal
 - ii. Radiation
 - iii. Asphyxiation
 - iv. Chemical (i.e., poisons, corrosives)
 - v. Etiologic
 - vi. Mechanical
 - vii. Psychological/psychogenic
 - d. Identify the general routes of entry for human exposure to hazardous materials/WMD.
 - i. Contact
 - ii. Absorption
 - iii. Inhalation
 - iv. Ingestion
4. Given examples of hazardous materials/WMD and the identity of each hazardous material/WMD (name, UN/NA identification number, or type placard), identify the following response information:
 - a. Emergency action (fire, spill, or leak and first aid)
 - b. Personal protective equipment necessary
 - c. Initial isolation and protective action distances
5. Given the name of a hazardous material, identify the recommended personal protective equipment from the following list:
 - a. Street clothing and work uniforms
 - b. Structural fire-fighting protective clothing
 - c. Positive pressure self-contained breathing apparatus
 - d. Chemical-protective clothing and equipment
6. Identify the definitions for each of the following protective actions:
 - a. Isolation of the hazard area and denial of entry
 - b. Evacuation
 - c. Sheltering in-place

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7. Identify the size and shape of recommended initial isolation and protective action zones.
 - a. initial isolation zones
 - b. protective action zones
8. Describe the difference between small and large spills as found in the Table of Initial Isolation and Protective Action Distances in the DOT *Emergency Response Guidebook*.
 - a. large spill/release
 - b. small spill/release
9. Identify the circumstances under which the following distances are used at a hazardous materials /WMD incidents:
 - a. Table of Initial Isolation and Protective Action Distances (green-bordered pages)
 - b. Isolation distances in the numbered guides (orange-bordered pages)
10. Describe the difference between the isolation distances on the orange-bordered guidebook pages and the protective action distances on the green-bordered ERG (*Emergency Response Guidebook*) pages.
11. Identify the techniques used to isolate the hazard area and deny entry to unauthorized persons at hazardous materials/WMD incidents.
12. Identify at least four specific actions necessary when an incident is suspected to involve criminal or terrorist activity.
 - a. Take the appropriate actions to protect yourself and other personnel
 - b. Communicate the suspicion during the notification process
 - c. Isolate potentially exposed people or animals
 - d. Document the initial observation
 - e. Be alert for booby traps and explosive devices

601-4.4.2 **Initiating the Notification Process**

Given scenarios involving hazardous materials/WMD incidents, awareness level personnel shall identify the initial notifications to be made and how to make them, consistent with the emergency response plan and/or standard operating procedures.

601-4.5 **Competencies — Evaluating Progress**
No competencies required at this level.

601-4.6 **Competencies — Terminating the Incident**

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No competencies required at this level.

REFERENCE LIST FOR THE HAZARDOUS MATERIALS OPERATIONS CURRICULA

This Reference List is provided as a general guide for both instructors and students to locate information pertaining to the specific objectives in the TCFP Curriculum. This list is **not** all-inclusive and does not in any way limit TCFP development and use of questions to test the objectives of the curriculum:

Required References

Texts

Certification Curriculum Manual. Texas Commission on Fire Protection. (Most current edition). Austin, TX: Texas Commission on Fire Protection.

Code of Federal Regulations, Title 29 Part 1910.120, Appendix A. United States. U.S. Department of Labor, Occupational Safety & Health Administration.
http://edocket.access.gpo.gov/cfr_2007/julqtr/pdf/29cfr1910.120.pdf

Emergency Response Guidebook. United States. (Most current edition). Washington, DC: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration.

Essentials of Fire Fighting, 5th edition. International Fire Service Training Association. (2008). Stillwater, OK: Fire Protection Publications, Oklahoma State University.

Firefighter's Handbook: Essentials of Firefighting and Emergency Response, 3rd edition. Delmar Publishers. (2008). Clifton Park, NY: Delmar, Cengage Learning.

Fundamentals of Fire Fighter Skills, 2nd edition. International Association of Fire Chiefs, & National Fire Protection Association. (2008). Sudbury, MA: Jones and Bartlett.

Hazardous Materials Awareness and Operations. DeBobes, L. J. (2009). Sudbury, MA: Jones & Bartlett.

Hazardous Materials for First Responders, 3rd edition. Adams, B., & Miller, L. A. (2004). Stillwater, OK: Fire Protection Publications, Oklahoma State University.

Hazardous Materials Handbook: Awareness and Operations Levels. Hawley, C., & Walter, A. (2008). Clifton Park, NY: Delmar, Cengage Learning.

Hazardous Materials/Weapons of Mass Destruction Response Handbook, 5th edition. Trebisacci, D. G. (2008). Quincy, MA: National Fire Protection Association.

NFPA 472: Standard for Professional Competence of Responders to Hazardous Materials Incidents. (2008). Quincy, MA: NFPA Publications. National Fire Protection Association

NIOSH Pocket Guide to Chemical Hazards. Cincinnati National Institute for Occupational Safety and Health. (2005 or most current edition). OH: US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. <http://www.cdc.gov/niosh/npg/>

Standards Manual for Fire Protection Personnel. Texas Commission on Fire Protection. (Most current edition). Austin, TX: Texas Commission on Fire Protection.

Recommended References

The most current edition of the following publications and media are recommended (not required) supplemental material for program use.

Texts

DOT Chart 13: Hazardous Materials Marking, Labeling and Placarding Guide. United States. (2007). Washington, DC: U.S. Dept. of Transportation, Pipeline and Hazardous Materials Safety Administration.

Hazardous Materials Field Guide, 2nd edition. Bevelacqua, A. S., & Stilp, R. H. (2007). Albany, NY: Delmar Publications.

Symbol Seeker: Hazard Identification Manual. Burns, P. P. (2002). Preston, England: Symbol Seeker.

Media

Emergency Response Guidebook 2008. United States. (2008). [DVD]. Washington, DC: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration.

Hazardous Materials Awareness and Operations. International Association of Fire Chiefs, & National Fire Protection Association. (2006). [DVD Set]. Sudbury, MA: Jones and Bartlett.

Hazmat Decontamination. Action Training Systems, Inc. (2008). [4 Disc DVD Set]. Poulsbo, WA: Action Training Systems.

Hazmat Operations. Detrick Lawrence Corporation, Pye, S., & Lamont, J. B. (2006). [8 Disk DVD Set]. Edgartown, MA: Emergency Film Group.

**CHAPTER 6
 SECTION 602
 HAZARDOUS MATERIALS OPERATIONS
 CURRICULUM OUTLINE**

SECTION	SUBJECT	RECOMMENDED HOURS
602-5.1	General - Introduction - Laws, Regulations, and National Consensus Standards	1
602-5.2	Analyzing the Incident	14
602-5.3	Planning the Response	9
602-5.4	Implementing the Planned Response	6
602-5.5	Evaluating Progress	2
602-5.6	Terminating the Incident - Reserved - None required at this level	
TOTAL RECOMMENDED HOURS		32

The recommended hours include time for skills evaluation and are based on 12 students. Hours needed depend on the actual number of students.

Note: In order to successfully complete the Texas Commission on Fire Protection’s Basic Structure Firefighter curriculum, all the job performance requirements and knowledge skills and abilities must be mastered pertaining to:

- Awareness Level Personnel (Section 601),
- Operations Level Responder (Section 602),
- Operations Level Responder: Mission Specific Competencies of:
 - Using Personal Protective Equipment (Section 603-6.2),
 - Performing Product Control (Section 603-6.6)

This is in accordance with the competency requirements of *NFPA 1001: Standard for Fire Fighter Professional Qualifications* 2008 ed., the *TCFP Standards Manual*, and the *TCFP Certification Curriculum Manual*.

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SECTION 602

HAZARDOUS MATERIALS OPERATIONS

Hazardous Materials Operations Level Personnel are those who respond to hazardous materials/weapons of mass destruction (WMD) incidents for the purpose of implementing or supporting actions to protect nearby persons, the environment, or property from the effects of the release.

Response options for operations level responders are generally limited to nonintervention or defensive actions.

The Hazardous Materials Operations Level Responder must first master all the job performance requirements and knowledge, skills and abilities pertaining to:

- Awareness Level Personnel, and
- The competencies of this chapter

Note: In order to successfully complete the Texas Commission on Fire Protection's Basic Structure Firefighter curriculum, all the job performance requirements and knowledge, skills and abilities must be mastered pertaining to:

- **Awareness Level Personnel,**
- **Operations Level Responders, and**
- **Hazardous Materials Operations Level – Mission Specific Competencies of:**
 - **Using Personal Protective Equipment, and**
 - **Performing Product Control.**

This is in accordance with the competency requirements of *NFPA 1001: Standard for Fire Fighter Professional Qualifications 2008 Ed.*, the *TCFP Standards Manual* and the *TCFP Curriculum Manual*.

602-5.1 General

602-5.1.1 Introduction

602-5.1.1.1 The operations level responder shall be that person who responds to hazardous materials/weapons of mass destruction (WMD) incidents for the purpose of protecting nearby persons, the environment, or property from the effects of the release.

602-5.1.1.2 The operations level responder shall be trained to meet all competencies at the awareness level (Chapter 6, Section 601) and the competencies of this chapter.

602-5.1.1.3 The operations level responder shall receive additional training to meet applicable governmental occupational health and safety regulations.

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602-5.1.2 **Goal**

602-5.1.2.1 The goal of the competencies at this level shall be to provide operations level responders with the knowledge and skills to perform the core competencies in 5.1.2.2 safely.

602-5.1.2.2 When responding to hazardous materials/WMD incidents, operations level responders shall be able to perform the following tasks:

1. Analyze a hazardous materials/WMD incident to determine the scope of the problem and potential outcomes by completing the following tasks:
 - a. Survey a hazardous materials/WMD incident to identify the containers and materials involved, determine whether hazardous materials/WMD have been released, and evaluate the 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 hazardous material/WMD and its container.
 - d. Estimate the potential harm at a hazardous materials/WMD incident.
 - i. Thermal
 - ii. Radiation
 - iii. Asphyxiant
 - iv. Chemical
 - v. Etiologic
 - vi. Mechanical
 - vii. Psychological/psychogenic
2. Plan an initial response to a hazardous materials/WMD incident within the capabilities and competencies of available personnel and personal protective equipment by completing the following tasks:
 - a. Describe the response objectives for the hazardous materials/WMD incident.
 - i. Evacuation
 - ii. Search and Rescue
 - iii. Exposure Protection/Isolate the Area
 - iv. Defensive Control Techniques
 - v. Crime scene management and evidence preservation
 - vi. Recovery and termination
 - b. Describe the response options available for each objective.
 - i. Evacuation
 - a) Public protection actions
 - 1) Full scale evacuation
 - 2) Shelter-in-place
 - 3) Combination

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- ii. Search and Rescue
 - a) Based on training and equipment
 - b) Risk-benefit analysis (i.e., risk a lot/save a lot, risk a little/save a little)
 - iii. Exposure Protection/Isolate the Area
 - a) Establish initial isolation distance
 - b) Establish protective action distance
 - c) Establish control zones
 - iv. Defensive Control Techniques
 - a) Damming
 - 1) Overflow
 - 2) Underflow
 - b) Diking
 - c) Retention
 - d) Dispersion
 - e) Absorption
 - f) Adsorption
 - g) Dilution
 - h) Dissolution
 - i) Diversion
 - j) Vapor dispersion
 - k) Vapor suppression
 - l) Ventilation
 - m) Remote valve shutoff
 - v. Crime scene management and evidence preservation
 - a) Maintain scene control
 - b) Limit access
 - c) Maintain chain of custody
 - d) Coordinate with AHJ
 - vi. Recovery and termination
 - a) Short-term recovery
 - b) Long-term recovery
 - c) Termination activities
 - 1) Debriefing
 - 2) Critique
 - 3) Post-incident Analysis
 - d) Demobilization
 - c. Determine whether the personal protective equipment provided is appropriate for implementing each option.
 - d. Describe emergency decontamination procedures.
 - e. Develop a plan of action, including safety considerations.
3. Implement the planned response for a hazardous materials/WMD incident to favorably change the outcomes consistent with the emergency response plan and/or standard operating procedures by completing the following tasks:

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- a. Establish and enforce scene control procedures, including control zones, emergency decontamination, and communications.
 - b. Where criminal or terrorist acts are suspected, establish means of evidence preservation.
 - c. Initiate an incident command system (ICS) for hazardous materials/WMD incidents.
 - d. Perform tasks assigned as identified in the incident action plan.
 - e. Demonstrate emergency decontamination.
4. Evaluate the progress of the actions taken at a hazardous materials/WMD incident to ensure that the response objectives are being met safely, effectively, and efficiently by completing the following tasks:
- a. Evaluate the status of the actions taken in accomplishing the response objectives.
 - b. Communicate the status of the planned response.

602-5.2 **Core Competencies — Analyzing the Incident**

602-5.2.1 **Surveying Hazardous Materials/WMD Incidents**

Given scenarios involving hazardous materials/WMD incidents, the operations level responder shall survey the incident to identify the containers and materials involved, determine whether hazardous materials/WMD have been released, and evaluate the surrounding conditions and shall meet the requirements of 5.2.1.1 through 5.2.1.6.

602-5.2.1.1 Given three examples each of liquid, gas, and solid hazardous material or WMD, including various hazard classes, operations level personnel shall identify the general shapes of containers in which the hazardous materials/WMD are typically found.

602-5.2.1.1.1 Given examples of the following tank cars, the operations level responder shall identify each tank car by type, as follows:

1. Cryogenic liquid tank cars
2. Nonpressure tank cars (general service or low pressure cars)
3. Pressure tank cars

602-5.2.1.1.2 Given examples of the following intermodal tanks, the operations level responder shall identify each intermodal tank by type, as follows:

1. Nonpressure intermodal tanks
 - a. IM-101 (IMO Type 1)
 - b. IM-102 (IMO Type 2)

2. Pressure intermodal tanks (Spec 51/IMO Type 5)
3. Specialized intermodal tanks, including the following:
 - a. Cryogenic intermodal tanks (IMO Type 7)
 - b. Tube modules

602-5.2.1.1.3 Given examples of the following cargo tanks, the operations level responder shall identify each cargo tank by type, as follows: (NOTE: CGA=Compressed Gas Association, MC= Motor Carrier, TC=Transport Canada, DOT=Dept. of Transportation, SCT=Secretariat of Communications and Transportation [Mexico])

1. Compressed gas tube trailers
2. Corrosive liquid tanks
 - DOT 412, TC 412, SCT 312, MC 312, TC 312
3. Cryogenic liquid tanks
 - MC 338, TC 338, SCT 338, TC 341, CGA 341
4. Dry bulk cargo tanks
5. High pressure tanks
 - MC 331, TC 331, SCT 331
6. Low pressure chemical tanks
 - DOT 407, TC 407, SCT 307, MC 307, TC 307
7. Non-pressure liquid tanks
 - DOT 406, TC 406, SCT 306, MC 306, TC 306

602-5.2.1.1.4 Given examples of the following storage tanks, the operations level responder shall identify each tank by type, as follows:

1. Cryogenic liquid tank
 - a. Refrigerated storage tanks=less than 15 psi
 - b. High pressure cryogenic tanks=greater than 15psi
2. Non-pressure tank (Atmospheric pressure=0-0.5 psi)
 - a. Horizontal tank
 - b. Cone roof tank
 - c. Floating roof tank
 - d. Covered floating roof tank
 - e. Floating roof with geodesic dome
 - f. Lifter roof tank
 - g. Vapor dome roof tank
 - h. Underground storage tanks
3. Pressure tank

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- a. Low Pressure (0.5-15 psi)
 - i. Vertical dome roof tanks
- b. High pressure (greater than 15 psi)
 - i. Horizontal pressure vessel
 - ii. Spherical pressure vessel
 - iii. Noded spheroid
 - iv. Underground high pressure

602-5.2.1.1.5 Given examples of the following non-bulk packaging, the operations level responder shall identify each package by type, as follows:

1. Bags
2. Carboys and Jerricans
3. Cylinders
4. Drums
 - a. Types
 - i. Open head
 - ii. Closed head
 - b. Construction Materials
 - i. Metal
 - ii. Plastic
 - iii. Fiberboard
 - iv. Other suitable materials
 - c. Fittings
 - i. Bungs
 - ii. Chime ring
5. Dewar flask (cryogenic liquids)

602-5.2.1.1.6 Given examples of the following radioactive material packages, the operations level responder shall identify the characteristics of each container or package by type, as follows:

1. Excepted
2. Industrial
3. Type A
4. Type B
5. Type C

602-5.2.1.2 Given examples of containers, the operations level responder shall identify the markings that differentiate one container from another.

1. DOT Placarding and Labeling System
2. UN Numbers
3. NFPA 704 Marking System
4. Hazardous Materials Identification System (HMIS)
5. Hazard Identification Codes (Intermodal Containers)
 - a. Also known as “hazard identification numbers,” or;
 - b. Kemler code

602-5.2.1.2.1 Given examples of the following marked transport vehicles and their corresponding shipping papers, the operations level responder shall identify the following vehicle or tank identification marking:

1. Highway transport vehicles, including cargo tanks
 - a. Company names and logos
 - b. Vehicle identification numbers
 - c. Manufacturer’s specification plate
2. Intermodal equipment, including tank containers
 - a. Reporting marks
 - b. Tank number
 - c. Specification markings
3. Rail transport vehicles, including tank cars
 - a. Standard transportation commodity code (STCC)
 - b. Commodity stencil
 - c. Reporting marks
 - d. Capacity stencil
 - e. Specification markings

602-5.2.1.2.2 Given examples of facility containers, the operations level responder shall identify the markings indicating container size, product contained, and/or site identification numbers.

1. NFPA 704 Marking System
2. Hazardous Materials Identification System (HMIS)
3. Facility specification markings
4. Manufacturer’s specification plate

602-5.2.1.3 Given examples of hazardous materials incidents, the operations level responder shall identify the name(s) of the hazardous material(s) in 5.2.1.3.1 through 5.2.1.3.3.

- 602-5.2.1.3.1** The operations level responder shall identify the following information on a pipeline marker:
1. Emergency telephone number
 2. Owner
 3. Product
- 602-5.2.1.3.1** Given a pesticide label, the operations level responder shall identify each of the following pieces of information, then match the piece of information to its significance in surveying hazardous materials incidents:
1. Active ingredient
 2. Hazard statement
 3. Name of pesticide
 4. EPA Registration Number (Pest Control Product (PCP) number in Canada)
 5. Precautionary statement
 6. Signal word
 - a. Poison/Danger
 - b. Warning
 - c. Caution
- 602-5.2.1.3.3** Given a label for a radioactive material, the operations level responder shall identify the type or category of label, contents, activity, transport index, and criticality safety index as applicable.
1. Radioactive White-I Label
 2. Radioactive Yellow-II Label
 3. Radioactive Yellow-III Label
- 602-5.2.1.3** The operations level responder shall identify and list the surrounding conditions that should be noted when a hazardous materials/WMD incident is surveyed.
1. Topography
 2. Land use
 3. Accessibility

4. Weather conditions
5. Bodies of water
6. Public exposure potential
7. Overhead and underground wires and pipelines
8. Storms and sewer drains
9. Possible ignition sources
10. Adjacent land use
11. Nature and extent of injuries
12. Building information
13. Ventilation ducts
14. Air returns

602-5.2.1.5 The operations level responder shall give examples of ways to verify information obtained from the survey of a hazardous materials/WMD incident.

1. CHEMTREC
2. MSDS
3. Emergency Response Guides
4. Shipping Papers
5. Online or computer-based data/programs

602-5.2.1.6 The operations level responder shall identify at least three additional hazards that could be associated with an incident involving terrorist or criminal activities.

1. Secondary events/devices intended to incapacitate or delay emergency responders
2. Armed resistance
3. Use of weapons
4. Booby traps
5. Secondary contamination from handling patients

602-5.2.2

Collecting Hazard and Response Information

Given scenarios involving known hazardous materials/WMD, the operations level responder shall collect hazard and response information using MSDS, CHEMTREC/CANUTEC/SETIQ, governmental authorities, and shippers and manufacturers and shall meet the following requirements:

1. Match the definitions associated with the UN/DOT hazard classes and divisions of hazardous materials/WMD, including refrigerated liquefied gases and cryogenic liquids, with the class or division.
2. Identify two ways to obtain an MSDS in an emergency.
 - a. Shipper
 - b. Manufacturer
 - c. CHEMTREC
 - d. Websites
3. Using an MSDS for a specified material, identify the following hazard and response information:
 - a. Physical and chemical characteristics
 - b. Physical hazards of the material
 - c. Health hazards of the material
 - d. Signs and symptoms of exposure
 - e. Routes of entry
 - f. Permissible exposure limits
 - g. Responsible party contact
 - h. Precautions for safe handling (including hygiene practices, protective measures, and procedures for cleanup of spills and leaks)
 - i. Applicable control measures, including personal protective equipment
 - j. Emergency and first-aid procedures
4. Identify the following:
 - a. Type of assistance provided by CHEMTREC/CANUTEC/SETIQ and governmental authorities
 - i. Immediate advice and shipper contact information
 - ii. Hazard information warnings and guidance
 - b. Procedure for contacting CHEMTREC/CANUTEC/SETIQ and governmental authorities
 - c. Information to be furnished to CHEMTREC/CANUTEC/SETIQ and governmental authorities
 - i. Responder organization name
 - ii. Location and nature of problem (spill, fire, etc.)
 - iii. Name and identification number of materials(s) involved
 - iv. Shipper/consignee/point of origin
 - v. Carrier name, rail car or truck number
 - vi. Container type and size
 - vii. Quantity of materials transported/released

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- viii. Local conditions (weather, terrain, proximity to schools, hospitals, waterways, etc.)
 - ix. Injuries and exposures
 - x. Local emergency service that have been notified
5. Identify two methods of contacting the manufacturer or shipper to obtain hazard and response information.
 - a. Shipping paper contact information
 - b. MSDS contact information
 - c. CHEMTREC
6. Identify the type of assistance provided by governmental authorities with respect to criminal or terrorist activities involving the release or potential release of hazardous materials/WMD.
 - a. Federal
 - i. DHS - Homeland Security Issues
 - ii. FBI - Crisis Management
 - iii. FEMA - Consequence Management
 - iv. EPA - Environmental Management
 - v. US Coast Guard - Navigable Waterway Management & Port Security
 - vi. DOD - Explosives, Munitions, Military Shipments Technical Assistance/Response
 - vii. ATF - Explosives Technical Assistance
 - b. State
 - i. DPS - District Disaster Chair (DDC)
 - ii. TDEM - Emergency Management
 - iii. TCEQ - Environmental Management
 - iv. TGLO - Water Quality
 - v. TRRC - Pipelines and Propane Storage
 - c. Local
 - i. Local emergency management
 - ii. Local fire department
 - iii. Local police department
 - iv. EMS providers
7. Identify the procedure for contacting local, state, and federal authorities as specified in the emergency response plan and/or standard operating procedures.
8. Describe the properties and characteristics of the following:
 - a. Alpha radiation
 - b. Beta radiation
 - c. Gamma radiation
 - d. Neutron radiation

602-5.2.3

Predicting the Likely Behavior of a Material and Its Container

Given scenarios involving hazardous materials/WMD incidents, each with a single hazardous material/WMD, the operations level responder shall predict

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the likely behavior of the material or agent and its container and shall meet the following requirements:

1. Interpret the hazard and response information obtained from the current edition of the DOT *Emergency Response Guidebook*, MSDS, CHEMTREC/CANUTEC/SETIQ, governmental authorities, and shipper and manufacturer contacts, as follows:
 - a. Match the following chemical and physical properties with their significance and impact on the behavior of the container and its contents:
 - i. Boiling point
 - ii. Chemical reactivity
 - iii. Corrosivity (pH)
 - iv. Flammable (explosive) range
 - a) Lower Explosive Limit (LEL)
 - b) Upper Explosive Limit (UEL)
 - v. Flash point
 - vi. Ignition (autoignition) temperature
 - vii. Particle size
 - viii. Persistence
 - ix. Physical state (solid, liquid, gas)
 - x. Radiation (ionizing and non-ionizing)
 - xi. Specific gravity
 - xii. Toxic products of combustion
 - xiii. Vapor density
 - xiv. Vapor pressure
 - xv. Water solubility
 - b. Identify the differences between the following terms:
 - i. Contamination and secondary contamination
 - ii. Exposure and contamination
 - iii. Exposure and hazard
 - iv. Infectious and contagious
 - v. Acute effects and chronic effects
 - vi. Acute exposures and chronic exposures
2. Identify three types of stress that can cause a container system to release its contents.
 - a. Thermal
 - b. Mechanical
 - c. Chemical
3. Identify five ways in which containers can breach.
 - a. Disintegration
 - b. Runaway cracking
 - c. Closures opening up
 - d. Punctures
 - e. Tears or spills
4. Identify four ways in which containers can release their contents.

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- a. Detonation
 - b. Violent rupture
 - c. Rapid relief
 - d. Spill or leak
5. Identify at least four dispersion patterns that can be created upon release of a hazardous material.
- a. Hemisphere
 - b. Cloud
 - c. Plume
 - d. Cone
 - e. Stream
 - f. Pool
 - g. Irregular
6. Identify the time frames for estimating the duration that hazardous materials/WMD will present an exposure risk.
- a. Short term – minutes and hours
 - b. Medium term – days, weeks, months
 - c. Long term – years and generations
7. Identify the health and physical hazards that could cause harm.
- a. Thermal
 - b. Radiation
 - c. Asphyxiation
 - d. Chemical (i.e., poisons, corrosives)
 - e. Etiologic
 - f. Mechanical
 - g. Psychological/psychogenic
8. Identify the health hazards associated with the following terms:
- a. Alpha, beta, gamma, and neutron radiation
 - b. Asphyxiant
 - i. Simple
 - ii. Chemical
 - c. Carcinogen
 - d. Convulsant
 - e. Corrosive
 - f. Highly toxic
 - g. Irritant
 - h. Sensitizer, allergen
 - i. Target organ effects
 - i. Hepatotoxins
 - ii. Nephrotoxins
 - iii. Neurotoxins
 - iv. Mutagens
 - v. Teratogens
 - vi. Hematoxins
 - vii. Pneumotoxins

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- viii. Cutaneous hazards
 - ix. Eye hazards
 - j. Toxic
9. Given the following, identify the corresponding UN/DOT hazard class and division:
- a. Blood agents
 - b. Biological agents and biological toxins
 - c. Choking agents
 - d. Irritants (riot control agents)
 - e. Nerve agents
 - f. Radiological materials
 - g. Vesicants (blister agents)

602-5.2.4

Estimating Potential Harm

Given scenarios involving hazardous materials/WMD incidents, the operations level responder shall estimate the potential harm within the endangered area at each incident and shall meet the following requirements:

1. Identify a resource for determining the size of an endangered area of a hazardous materials/WMD incident.
2. Given the dimensions of the endangered area and the surrounding conditions at a hazardous materials/WMD incident, estimate the number and type of exposures within that endangered area.
3. Identify resources available for determining the concentrations of a released hazardous material/WMD within an endangered area.
4. Given the concentrations of the released material, identify the factors for determining the extent of physical, health, and safety hazards within the endangered area of a hazardous materials/WMD incident.
5. Describe the impact that time, distance, and shielding have on exposure to radioactive materials specific to the expected dose rate.

602-5.3

Core Competencies — Planning the Response

602-5.3.1

Describing Response Objectives

Given at least two scenarios involving hazardous materials/WMD incidents, the operations level responder shall describe the response objectives for each example and shall meet the following requirements:

1. Given an analysis of a hazardous materials/WMD incident and the exposures, determine the number of exposures that could be saved with the resources provided by the AHJ.
2. Given an analysis of a hazardous materials/WMD incident, describe the steps for determining response objectives.

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- a. Analyze the incident
 - b. Hazard analysis and risk assessment
 - c. Identify incident priorities
 - i. Life safety
 - ii. Incident stabilization
 - iii. Property preservation/environmental conservation
 - d. Develop Incident Objectives (SMART)
 - i. **S**pecific
 - ii. **M**easurable
 - iii. **A**ttainable
 - iv. **R**ealistic
 - v. **T**imely
 - e. Periodically reassess
3. Describe how to assess the risk to a responder for each hazard class in rescuing injured persons at a hazardous materials/WMD incident.
NOTE: the following classes are assessed using the TRACEM-P acronym
- a. Class 1-thermal, radiological, asphyxiation, chemical, etiological, mechanical
 - b. Class 2-thermal, asphyxiation, chemical, etiological, mechanical
 - c. Class 3-thermal, chemical, mechanical
 - d. Class 4-thermal, chemical, mechanical
 - e. Class 5-thermal, chemical, mechanical
 - f. Class 6-thermal, asphyxiation, chemical, etiological
 - g. Class 7-radiological, chemical
 - h. Class 8-thermal, chemical, mechanical
 - i. Class 9-thermal, radiological, asphyxiation, chemical, etiological, mechanical
4. Assess the potential for secondary attacks and devices at criminal or terrorist events.
- a. Human threats
 - b. Secondary devices
 - c. Multiple agency response
 - i. Fire
 - ii. Hazardous materials
 - iii. EMS
 - iv. Law Enforcement

602-5.3.2

Identifying Action Options

Given examples of hazardous materials/WMD incidents (facility and transportation), the operations level responder shall identify the options for each response objective and shall meet the following requirements:

1. Identify the options to accomplish a given response objective.
 - a. Evacuation
 - b. Recognition, identification, notification, isolation

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2. Describe the prioritization of emergency medical care and removal of victims from the hazard area relative to exposure and contamination concerns.
 - a. Per AHJ
 - b. Per Medical Protocol

602-5.3.3

Determining Suitability of Personal Protective Equipment

Given examples of hazardous materials/WMD incidents, including the name of the hazardous material/WMD involved and the anticipated type of exposure, the operations level responder shall determine whether available personal protective equipment is applicable to performing assigned tasks and shall meet the following requirements:

1. Identify the respiratory protection required for a given response option and the following:
 - a. Describe the advantages, limitations, uses, and operational components of the following types of respiratory protection at hazardous materials/WMD incidents:
 - i. Positive pressure self-contained breathing apparatus (SCBA)
 - ii. Positive pressure air-line respirator with required escape unit
 - iii. Closed-circuit SCBA
 - iv. Powered air-purifying respirator (PAPR)
 - v. Air-purifying respirator (APR)
 - vi. Particulate respirator
 - b. Identify the required physical capabilities and limitations of personnel working in respiratory protection.
2. Identify the personal protective clothing required for a given option and the following:
 - a. Identify skin contact hazards encountered at hazardous materials/WMD incidents.
 - i. Burns
 - ii. Rash
 - iii. Absorption
 - b. Identify the purpose, advantages, and limitations of the following types of protective clothing at hazardous materials/WMD incidents:
 - i. Chemical-protective clothing: liquid splash-protective clothing and vapor-protective clothing
 - ii. High temperature-protective clothing: proximity suit and entry suits
 - iii. Structural fire-fighting protective clothing

602-5.3.4

Identifying Decontamination Issues

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Given scenarios involving hazardous materials/WMD incidents, operations level responders shall identify when emergency decontamination is needed and shall meet the following requirements:

1. Identify ways that people, personal protective equipment, apparatus, tools, and equipment become contaminated.
2. Describe how the potential for secondary contamination determines the need for decontamination.
3. Explain the importance and limitations of decontamination procedures at hazardous materials incidents.
4. Identify the purpose of emergency decontamination procedures at hazardous materials incidents.
5. Identify the factors that should be considered in emergency decontamination.
6. Identify the advantages and limitations of emergency decontamination procedures.

602-5.4

Core Competencies — Implementing the Planned Response

602-5.4.1

Establishing and Enforcing Scene Control Procedures

Given two scenarios involving hazardous materials/WMD incidents, the operations level responder shall identify how to establish and enforce scene control, including control zones and emergency decontamination, and communications between responders and to the public and shall meet the following requirements:

1. Identify the procedures for establishing scene control through control zones.
2. Identify the criteria for determining the locations of the control zones at hazardous materials/WMD incidents.
3. Identify the basic techniques for the following protective actions at hazardous materials/WMD incidents:
 - a. Evacuation
 - b. Sheltering-in-place
4. Demonstrate the ability to perform emergency decontamination
5. Identify the items to be considered in a safety briefing prior to allowing personnel to work at the following:
 - a. Hazardous material incidents
 - i. Preliminary evaluation
 - ii. Hazard identification

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- iii. Description of site
 - iv. Task(s) to be performed
 - v. Length of time for task(s)
 - vi. Required personnel protective clothing
 - vii. Monitoring requirements
 - viii. Notification of identified risks
- b. Hazardous materials/WMD incidents involving criminal activities
6. Identify the procedures for ensuring coordinated communication between responders and to the public.

602-5.4.2

Preserving Evidence

Given two scenarios involving hazardous materials/WMD incidents, the operations level responder shall describe the process to preserve evidence as listed in the emergency response plan and/or standard operating procedures.

602-5.4.3

Initiating the Incident Command System

Given scenarios involving hazardous materials/WMD incidents, the operations level responder shall initiate the incident command system specified in the emergency response plan and/or standard operating procedures and shall meet the following requirements:

1. Identify the role of the operations level responder during hazardous materials/WMD incidents as specified in the emergency response plan and/or standard operating procedures.
2. Identify the levels of hazardous materials/WMD incidents as defined in the emergency response plan.
3. Identify the purpose, need, benefits, and elements of the incident command system for hazardous materials/WMD incidents.
4. Identify the duties and responsibilities of the following functions within the incident management system:
 - a. Incident Safety Officer
 - i. Obtains briefing from:
 - a) Incident Commander; or
 - b) Incident Safety Officer; and
 - c) Hazard Branch Director or Hazard Division/Group Supervisor
 - ii. Participates in:
 - a) Preparation of incident safety plan
 - b) Implementation of the incident safety plan; and
 - c) Medical monitoring of entry team personnel before and after entry
 - iii. Advises Incident Commander or Hazard Branch Director or Hazard Division/Group Supervisor of:

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- a) Deviations from the incident safety plan
 - b) Dangerous or unsafe activities
 - iv. Alters, suspends, or terminates any operation that is considered unsafe
 - b. Hazardous materials branch or group
5. Identify the considerations for determining the location of the incident command post for a hazardous materials/WMD incident.
 6. Identify the procedures for requesting additional resources at a hazardous materials/WMD incident.
 7. Describe the role and response objectives of other agencies that respond to hazardous materials/WMD incidents.

602-5.4.4

Using Personal Protective Equipment

The operations level responder shall describe considerations for the use of personal protective equipment provided by the AHJ, and shall meet the following requirements:

1. Identify the importance of the buddy system.
2. Identify the importance of the backup personnel.
3. Identify the safety precautions to be observed when approaching and working at hazardous materials/WMD incidents.
4. Identify the signs and symptoms of heat and cold stress and procedures for their control.
5. Identify the capabilities and limitations of personnel working in the personal protective equipment provided by the AHJ.
6. Identify the procedures for cleaning, disinfecting, and inspecting personal protective equipment provided by the AHJ.
7. Describe the maintenance, testing, inspection, and storage procedures for personal protective equipment provided by the AHJ according to the manufacturer's specifications and recommendations.

602-5.5

Core Competencies — Evaluating Progress

602-5.5.1

Evaluating the Status of Planned Response

Given two scenarios involving hazardous materials/WMD incidents, including the incident action plan, the operations level responder shall evaluate the status of the actions taken in accomplishing the response objectives and shall meet the following requirements:

1. Identify the considerations for evaluating whether actions taken were effective in accomplishing the objectives.
 - a. Incident stabilized
 - b. Incident increasing in intensity
2. Describe the circumstances under which it would be prudent to withdraw from a hazardous materials/WMD incident.

602-5.5.2

Communicating the Status of the Planned Response

Given two scenarios involving hazardous materials/WMD incidents, including the incident action plan, the operations level responder shall communicate the status of the planned response through the normal chain of command and shall meet the following requirements:

1. Identify the methods for communicating the status of the planned response through the normal chain of command.
2. Identify the methods for immediate notification of the incident commander and other response personnel about critical emergency conditions at the incident.

602-5.6

Competencies — Terminating the Incident (Reserved)

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REFERENCE LIST FOR THE HAZARDOUS MATERIALS INCIDENT COMMANDER CURRICULUM

This Reference List is provided as a general guide for both instructors and students to locate information pertaining to the specific objectives in the TCFP Curriculum. This list is **not** all-inclusive and does not in any way limit TCFP development and use of questions to test the objectives of the curriculum:

Required References

Texts

Certification Curriculum Manual. Texas Commission on Fire Protection. (Most current edition). Austin, TX: Texas Commission on Fire Protection.

Code of Federal Regulations, Title 29 Part 1910.120, Appendix A. United States. U.S. Department of Labor, Occupational Safety & Health Administration.
http://edocket.access.gpo.gov/cfr_2007/julqtr/pdf/29cfr1910.120.pdf

Emergency Action Guides. Association of American Railroads. (2006). Pueblo, CO: Association of American Railroads.

Emergency Response Guidebook. United States. (Most current edition). Washington, DC: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration.

Fire Fighter's Handbook of Hazardous Materials, Baker, Charles T., 7th edition. (2006). Sudbury, MA: Jones and Bartlett.

Hazardous Materials: Managing the Incident. Chester Noll, G. G., Hildebrand, M. S., & Yvorra, J. G. (2005). MD: Red Hat Publishing Company, Inc.

Hazardous Materials/Weapons of Mass Destruction Response Handbook, 5th edition. Trebisacci, D. G. (2008). Quincy, MA: National Fire Protection Association.

NFPA 472: Standard for Professional Competence of Responders to Hazardous Materials Incidents. (2008 ed.). Quincy, MA: NFPA Publications. National Fire Protection Association

NIOSH Pocket Guide to Chemical Hazards. Cincinnati National Institute for Occupational Safety and Health. (Most current edition). OH: US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. <http://www.cdc.gov/niosh/npg/>

Standards Manual for Fire Protection Personnel. Texas Commission on Fire Protection. (Most current edition). Austin, TX: Texas Commission on Fire Protection.

Recommended References

The most current edition of the following publications and media are recommended (not required) supplemental material for program use.

Texts

Bretherick's Handbook of Reactive Chemical Hazards. Urben, P. G., Pitt, M. J., & Bretherick, L. (2007). Amsterdam: Elsevier.

Chlorine Emergencies: An Overview for First Responders. Chlorine Institute. (2007). Arlington, VA: The Chlorine Institute.

CHRIS: Chemical Hazards Response Information System. United States. (1992). COMDTINST, M16465.11B. Washington, DC: U.S. Dept. of Transportation, U.S. Coast Guard.

Dangerous Properties of Industrial and Consumer Chemicals. Cheremisinoff, N. P., King, J. A., & Boyko, R. (1994). New York, NY: M. Dekker.

Emergency Care for Hazardous Materials Exposure. Currance, P., Bronstein, A. C., & Clements, B. (2005). St. Louis, MO: Mosby.

Emergency Handling of Hazardous Materials in Surface Transportation. Association of American Railroads. (2009). Washington, DC: Association of American Railroads.

Fire Protection Guide to Hazardous Materials. National Fire Protection Association. (2001). Quincy, MA: National Fire Protection Association.

Hazardous Materials: Managing the Incident: Field Operations Guide. Chester Bevelacqua, A. S., Hildebrand, M. S., & Noll, G. G. (2007). MD: Red Hat Publishing, Inc.

Hawley's Condensed Chemical Dictionary. Lewis, R. J., & Hawley, G. G. (2007). West Sussex, England: Wiley.

Symbol Seeker: Hazard Identification Manual. Burns, P. P. (2002). Preston, England: Symbol Seeker.

Media

Hazardous Materials Containment Series. Action Training Systems. [4 Disc DVD Set]. Hazardous materials containment - series of 4 titles. Seattle, WA: Action Training Systems.

Hazardous Materials: Managing the Incident DVD Series. Massingham, G., Noll, G. G., Hildebrand, M. S., & Noll, G. G. (2005). [8 Disc DVD Set]. Edgartown, MA: Emergency Film Group.

**CHAPTER 6
SECTION 605
HAZARDOUS MATERIALS INCIDENT COMMANDER
CURRICULUM OUTLINE**

SECTION	SUBJECT	RECOMMENDED HOURS
605-8.1	General - Introduction - Laws, Regulations, and National Consensus Standards	1
605-8.2	Analyzing the Incident	4
605-8.3	Planning the Response	9
605-8.4	Implementing the Planned Response	4
605-8.5	Evaluating Progress	2
605-8.6	Terminating the Incident	4
	TOTAL RECOMMENDED HOURS	24

The recommended hours include time for skills evaluation and are based on 12 students. Hours needed depend on the actual number of students.

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SECTION 605

HAZARDOUS MATERIALS INCIDENT COMMANDER

The Hazardous Materials Incident Commander is the person responsible for all hazardous materials/weapons of mass destruction (WMD) incident activities, including the development of strategies and tactics and the ordering and release of resources. The Hazardous Materials Incident Commander has overall authority and responsibility for conducting incident operations and is responsible for the management of all incident operations at the hazardous materials/weapons of mass destruction (WMD) incident site.

The Hazardous Materials Incident Commander must first master all the job performance requirements and knowledge, skills and abilities pertaining to:

- Awareness Level Personnel,
- Operations Level Responders and,
- The competencies of this chapter

The Hazardous Materials Incident Commander performs the following functions and is primarily responsible for:

- Having clear authority and knowledge of agency policy,
- Ensuring incident safety,
- Establishing the incident command post (ICP),
- Setting priorities, determining incident objectives and strategies to be followed,
- Establishing the incident command system (ICS) needed to manage the incident,
- Approving the incident action plan (IAP),
- Coordinating command and general staff functions,
- Approving resource order requests and the use of volunteers and auxiliary personnel,
- Ordering demobilization as needed,
- Ensuring after-action reports are completed.

605-8.1 General

605-8.1.1 Introduction

605-8.1.1.1 The incident commander (IC) shall be that person responsible for all incident activities, including the development of strategies and tactics and the ordering and release of resources.

605-8.1.1.2 The incident commander shall be trained to meet all competencies at the awareness level (Section 601), all core competencies at the operations level (Section 602), and all competencies in this chapter.

605-8.1.1.3 The incident commander shall receive any additional training necessary to meet applicable governmental occupational health and safety regulations.

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605-8.1.1.4 The incident commander shall receive any additional training necessary to meet specific needs of the jurisdiction.

605-8.1.2 **Goal**

605-8.1.2.1 The goal of the competencies at this level shall be to provide the incident commander with the knowledge and skills to perform the tasks in 8.1.2.2 safely.

605-8.1.2.2 In addition to being competent at the awareness and operations levels, the incident commander shall be able to perform the following tasks:

1. Analyze a hazardous materials/WMD incident to determine the complexity of the problem and potential outcomes by completing the following tasks:
 - a. Collect and interpret hazard and response information from printed and technical resources, computer databases, and monitoring equipment
 - b. Estimate the potential outcomes within the endangered area at a hazardous materials/WMD incident
2. Plan response operations within the capabilities and competencies of available personnel, personal protective equipment, and control equipment by completing the following tasks:
 - a. Identify the response objectives for hazardous materials/WMD incidents
 - b. Identify the potential response options (defensive, offensive, and nonintervention) available by response objective
 - c. Approve the level of personal protective equipment required for a given action option
 - d. Develop an incident action plan, including site safety and control plan, consistent with the emergency response plan or standard operating procedures and within the capability of available personnel, personal protective equipment, and control equipment
3. Implement a response to favorably change the outcome consistent with the emergency response plan or standard operating procedures by completing the following tasks:
 - a. Implement an incident command system/unified command, including the specified procedures for notification and utilization of nonlocal resources (e.g., private, state, and federal government personnel)
 - b. Direct resources (private, governmental, and others) with task assignments and on-scene activities and provide management overview, technical review, and logistical support to those resources
 - c. Provide a focal point for information transfer to media and local elected officials through the incident command system structure

4. Evaluate the progress of the planned response to ensure the response objectives are being met safely, effectively, and efficiently and adjust the incident action plan accordingly.
5. Terminate the emergency phase of the incident by completing the following tasks:
 - a. Transfer command (control) when appropriate
 - b. Conduct an incident debriefing
 - c. Conduct a multiagency critique
 - d. Report and document the hazardous materials/WMD incident and submit the report to the designated entity

605-8.2 **Competencies — Analyzing the Incident**

605-8.2.1 **Collecting and Interpreting Hazard and Response Information**

605-8.2.1.1 Given access to printed and technical resources, computer databases, and monitoring equipment, the incident commander shall collect and interpret hazard and response information not available from the current edition of the DOT *Emergency Response Guidebook* or an MSDS.

605-8.2.1.2 The incident commander shall be able to identify and interpret the types of hazard and response information available from each of the following resources and explain the advantages and disadvantages of each resource:

1. Hazardous materials databases – examples include:
 - a. CAMEO (Computer Assisted Management of Emergency Operations)
 - b. MARPLOT (Mapping Applications for Response, Planning and Local Operational Tasks)
 - c. ALOHA (Aerial Locations Of Hazardous Atmospheres)
 - d. WISER (Wireless Informational Systems for Emergency Responders)
 - e. OREIS (Operational Response Emergency Informational System)
2. Monitoring equipment – examples include:
 - a. Combustible gas indicators
 - b. Colorimetric tubes
 - c. Photoionization detectors/flame ionization detectors
 - d. Radiological survey equipment
 - e. Oxygen meters
 - f. Toxic Gas Sensors
 - g. pH paper
 - h. Chemical test strips
3. Reference manuals
 - a. DOT Emergency Response Handbook
 - b. ARR Hazardous Materials Emergency Action Guides

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- c. ARR General Handling of Hazardous Materials in Surface Transportation
 - d. Field Guide to Tank Guide Identification
 - e. Bretherick's Handbook of Reactive Substances
 - f. Emergency Care for Hazardous Materials Exposure
 - g. Hawley's Condensed Chemical Dictionary
 - h. NIOSH Pocket Guide
 - i. CHRIS Chemical Hazards Response Information System (USCG)
 - j. Dangerous Properties of Industrial Chemicals
 - k. NFPA Fire Protection Guide of Hazardous Materials
4. Technical information centers (i.e., CHEMTREC/CANUTEC/ SETIQ and local, state, and federal authorities) – examples include:
 - a. CHEMTREC
 - b. Chlorine Institute
 - c. US Coast Guard and DOT National Response Center
 - d. The Agency for Toxic Substance and Disease Registry (ATSDR)
 - e. National Animal Poison Control Center (NAPCC)
 - f. National Pesticide Informational Center (NPIC)
 - g. National Poison Control Center (Mr. Yuck)
 - h. US Army Operational Center
 - i. Defense Logistics Agency
 5. Technical information specialist

605-8.2.2 **Estimating Potential Outcomes**

Given scenarios involving hazardous materials/WMD incidents, the surrounding conditions, and the predicted behavior of the container and its contents, the incident commander shall estimate the potential outcomes within the endangered area and shall complete the following tasks:

1. Identify the steps for estimating the outcomes within an endangered area of a hazardous materials/WMD incident.
 - a. Determining the dimensions of the endangered area
 - b. Estimating the number of exposures within the endangered area
 - c. Measuring or predicting the concentrations of materials in the endangered area
 - d. Estimating the physical, health, and safety hazards within the endangered area
 - e. Identifying the area of potential harm within the endangered area
 - f. Estimating the potential outcomes within the endangered area
2. Describe the following toxicological terms and exposure values and explain their significance in the analysis process:
 - a. Counts per minute (cpm) and kilocounts per minute (kcpm)
 - b. Immediately dangerous to life and health (IDLH) value
 - c. Infectious dose
 - d. Lethal concentrations (LC₅₀)
 - e. Lethal dose (LD₅₀)

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- f. Parts per billion (ppb)
 - g. Parts per million (ppm)
 - h. Permissible exposure limit (PEL)
 - i. Radiation absorbed dose (rad)
 - j. Roentgen equivalent man (rem); millirem (mrem); microrem (μ rem)
 - k. Threshold limit value ceiling (TLV-C)
 - l. Threshold limit value short-term exposure limit (TLV-STEL)
 - m. Threshold limit value time-weighted average (TLV-TWA)
3. Identify two methods for predicting the areas of potential harm within the endangered area of a hazardous materials/WMD incident.
 - a. Determine the level of toxicity of the hazardous material that has been released in the endangered area
 - b. Determine the length of time that persons in the endangered area would be exposed to the hazard
 - c. Determine areas of potential harm using reference sources or direct monitoring instruments
 - i. *Emergency Response Guidebook*
 - ii. Computer dispersion models
 - a) CAMEO (Computer Assisted Management of Emergency Operations)
 - b) MARPLOT (Mapping Applications for Response, Planning and Local Operational Tasks)
 - c) ALOHA (Aerial Locations Of Hazardous Atmospheres)
 - d) WISER (Wireless Informational Systems for Emergency Responders)
 - iii. Portable and fixed air-monitoring systems
 4. Identify the methods available to the organization for obtaining local weather conditions and predictions for short-term future weather changes.
 - a. National Weather Service
 - b. Local weather service
 - c. Internet weather resources, i.e. Weather Bug station locations
 - d. On-scene direct monitoring instrumentation, i.e. WeatherPak
 5. Explain the basic toxicological principles relative to assessment and treatment of personnel exposed to hazardous materials, including the following:
 - a. Acute and delayed toxicity (chronic)
 - b. Dose response
 - c. Local and systemic effects
 - d. Routes of exposure
 - i. Inhalation
 - ii. Ingestion
 - iii. Absorption
 - iv. Injection
 - e. Synergistic effects

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6. Describe the health risks associated with the following:
 - a. Biological agents and biological toxins
 - b. Blood agents
 - c. Choking agents
 - d. Irritants (riot control agents)
 - e. Nerve agents
 - f. Radiological materials
 - g. Vesicants (blister agents)

605-8.3 **Competencies — Planning the Response**

605-8.3.1 **Identifying Response Objectives**

Given an analysis of a hazardous materials/WMD incident, the incident commander shall be able to describe the steps for determining response objectives (defensive, offensive, and nonintervention).

605-8.3.2 **Identifying the Potential Response Options**

Given scenarios involving hazardous materials/WMD, the incident commander shall identify the possible response options (defensive, offensive, and nonintervention) by response objective for each problem and shall complete the following tasks:

1. Identify the possible response options to accomplish a given response objective.
 - a. Offensive
 - i. Rescue
 - ii. Public Protective Actions
 - iii. Spill Control
 - iv. Leak Control
 - v. Fire Control
 - vi. Clean up and recovery
 - b. Defensive
 - i. Public Protective Actions
 - ii. Spill Control
 - iii. Fire Control
 - iv. Clean up and recovery
 - c. Non intervention - Public Protective Actions
2. Identify the purpose of each of the following techniques for hazardous materials control:
 - a. Absorption
 - b. Adsorption
 - c. Blanketing
 - d. Covering
 - e. Damming
 - f. Diking
 - g. Dilution
 - h. Dispersion
 - i. Diversion

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- j. Fire suppression
- k. Neutralization
 - i. For corrosive releases
 - a) Not for use on living tissue – use primarily on decon equipment or neutralize spills
 - b) Process generates heat
 - c) Final solution should be as close to pH 7 as possible
 - d) pH disposal guidelines dependent on AHJ
 - ii. For other chemical releases
 - a) Consult technical reference
 - b) Process typically generates heat
 - c) pH disposal guidelines dependent on AHJ
- l. Overpacking
- m. Patching
- n. Plugging
- o. Pressure isolation and reduction (flaring; venting; vent and burn; isolation of valves, pumps, or energy sources)
- p. Retention
- q. Solidification
- r. Transfer
- s. Vapor control (dispersion, suppression)

605-8.3.3

Approving the Level of Personal Protective Equipment

Given scenarios involving hazardous materials/WMD with known and unknown hazardous materials/WMD, the incident commander shall approve the personal protective equipment for the response options specified in the incident action plan in each situation and shall complete the following tasks:

1. Identify the four levels of chemical protection (EPA/OSHA) and describe the equipment required for each level and the conditions under which each level is used.
 - a. Level A – Vapor Protective Chemical Protective Clothing (CPC)
 - i. Encapsulated garment
 - ii. Requires SCBA (positive pressure self contained breathing apparatus) or SAR (supplied air respirator) use
 - b. Level B – Splash Protective CPC
 - i. Encapsulated garment
 - ii. Non-encapsulated garment
 - iii. Requires SCBA or SAR use
 - c. Level C – Splash Protective CPC
 - i. Non-encapsulated garment
 - ii. Utilizes APR (air purifying respirator) or PAPR (powered air purifying respirator)
 - d. Level D – Non-emergency/hazardous materials response work clothing
 - e. Chemical protective clothing for Level A, Level B or Level C ensembles should be selected based on one of the following applicable criteria:

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- i. NFPA 1991 *Standard on Vapor Protective Ensembles for Hazardous Materials Emergencies*
 - ii. NFPA 1992 *Standard on Liquid Splash Protective Ensembles and Clothing for Hazardous Materials Emergencies*
 - iii. NFPA 1994 *Standard on Protective Ensembles for First Responders to CBRN Terrorism Incidents*
2. Describe the following terms and explain their impact and significance on the selection of chemical-protective clothing:
 - a. Degradation
 - b. Penetration
 - c. Permeation
3. Describe three safety considerations for personnel working in vapor-protective, liquid splash-protective and high temperature-protective clothing.
 - a. Loss of dexterity
 - b. Limited vision
 - c. Reduced communications capability
 - d. Heat and/or cold stress
 - e. Need for rehabilitation
4. Identify the physiological and psychological stresses that can affect users of personal protective equipment.
 - a. Physiological
 - i. Extreme heat or cold operating conditions
 - ii. Noise
 - iii. Reduced vision from fogging of CPC or SCBA face pieces
 - iv. Operations in low-light or low-visibility environments
 - v. Reduced handling and dexterity due to the need to wear several layers of gloves
 - vi. Adverse weather conditions
 - vii. Physical hazards and the physical operating environment
 - b. Psychological
 - i. Lack of physical fitness and the physical ability to perform the required tasks
 - ii. Response operations involving injuries, fatalities or high-risk operations
 - iii. Operations within enclosed or confined space environments
 - iv. Background and experience levels in both wearing CPC and operating in hostile environments
 - v. Fear of either suit or respiratory protection failure

605-8.3.4 **Developing an Incident Action Plan**

Given scenarios involving hazardous materials/WMD incidents, the incident commander shall develop an incident action plan, including site safety and control plan, consistent with the emergency response plan or standard operating

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procedures and within the capability of the available personnel, personal protective equipment, and control equipment, and shall complete the tasks in 8.3.4.1 through 8.3.4.5.5.

605-8.3.4.1 The incident commander shall identify the steps for developing an incident action plan.

1. Analyze - Analyze the incident
2. Plan - Develop the Incident Action Plan including the following:
 - a. Site restrictions
 - b. Entry objectives
 - c. On-scene organization and control
 - d. Selection of personal protective equipment
 - e. Site safety plan (ICS 208HM)
 - f. Communications procedures
 - g. Emergency procedures and personnel accountability
 - h. Emergency medical care arrangements
 - i. Rehabilitation plan
 - j. Decontamination procedures
 - k. On-scene work assignments (branches)
 - l. Ensure debriefing and critiquing of the incident is conducted once the incident is terminated
 - m. Document the plan using:
 - i. Appropriate regulatory agency methods as necessary
 - ii. Department of Homeland Security – National Incident Management System/Incident Command System standardized forms
 - a) ICS 201 Incident Briefing Form
 - b) ICS 202 Incident Objectives Worksheet
 - c) ICS 203 Organization Assignment List
 - d) ICS 204 Division Assignment List
 - e) ICS 205 Communications Plan
 - f) ICS 206 Medical Plan
 - g) ICS 208HM Site Safety and Control Plan
 - h) ICS 211 Incident Check-in List
 - i) ICS 213 General Message
 - j) ICS 214 Unit Log
 - k) ICS 215 Incident Planning Worksheet
 - l) ICS 215A Incident Action Plan Safety Analysis
3. Implement - Implement the plan
4. Evaluate - Evaluate the plan's effectiveness and revise as necessary

605-8.3.4.2 The Incident Commander shall identify the factors to be evaluated in selecting public protective actions, including evacuation and sheltering-in-place.

1. The Hazardous Material Involved

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- a. Degree of health hazard
 - b. Chemical and physical properties
 - c. Amount involved
 - d. Containment/control of release
 - e. Rate of vapor movement
2. The Population Threatened
 - a. Location
 - b. Number of people
 - c. Time available to evacuate or shelter in-place
 - d. Ability to control evacuation or shelter-in-place
 - e. Building types and availability
 - f. Special institutions or populations, e.g., nursing homes, hospitals, prisons
3. Weather Conditions
 - a. Effect on vapor and cloud movement
 - b. Potential for change
 - c. Effect on evacuation or protection in-place

605-8.3.4.3 Given the emergency response plan or standard operating procedures, the incident commander shall identify which agency will perform the following:

1. Receive the initial notification
2. Provide secondary notification and activation of response agencies
3. Make ongoing assessments of the situation
4. Command on-scene personnel (incident management system)
5. Coordinate support and mutual aid
6. Provide law enforcement and on-scene security (crowd control)
7. Provide traffic control and rerouting
8. Provide resources for public safety protective action (evacuation or shelter in-place)
9. Provide fire suppression services
10. Provide on-scene medical assistance (ambulance) and medical treatment (hospital)
11. Provide public notification (warning)
12. Provide public information (news media statements)

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13. Provide on-scene communications support
14. Provide emergency on-scene decontamination
15. Provide operations-level hazard control services
16. Provide technician-level hazard mitigation services
17. Provide environmental remedial action (cleanup) services
18. Provide environmental monitoring
19. Implement on-site accountability
20. Provide on-site responder identification
21. Provide incident command post security
22. Provide incident or crime scene investigation
23. Provide evidence collection and sampling

605-8.3.4.4 The incident commander shall identify the process for determining the effectiveness of a response option based on the potential outcomes.

1. Evaluate the effectiveness of the response based on:
 - a. Are the IAP objectives being met?
 - b. What problems have arisen?
2. Revise or modify the incident action plan based on identified needs
3. Reevaluate the effectiveness of the revised IAP
4. Continually monitor the effectiveness of the IAP

605-8.3.4.5 The incident commander shall identify the safe operating practices and procedures that are required to be followed at a hazardous materials/WMD incident.

1. Approach cautiously from upwind, uphill and up stream
2. Secure the scene
 - a. Establish command
 - b. Implement ICS
 - c. Implement isolation zones
3. Identify the hazards
4. Assess the situation - perform hazard and risk analysis

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5. Obtain help as needed
 - a. Ensure that all responders are only assigned to duties commensurate with their level of training
 - b. Awareness level personnel cannot intervene directly with the material
 - c. Operations level personnel can only perform defensive response tasks
 - d. Operations personnel trained to a mission specific competency may perform that task under the direct supervision of Technician level personnel
 - e. Technician level personnel may perform offensive response activities
 - f. Specialist personnel may provide technical assistance, advice or response support depending on their degree of training
 - g. Skilled support personnel may operate special equipment needed to support the response. They may not have any hazardous materials training and must be adequately briefed prior to being utilized.
6. Decide on site entry – if applicable
7. Respond
 - a. Develop IAP
 - b. Develop site safety plan
 - c. Implement IAP
8. Above all, do not come into contact with the material
 - a. Do not smell the material
 - b. Do not touch the material
 - c. Do not taste the material

605-8.3.4.5.1 The incident commander shall identify the importance of pre-incident planning relating to safety during responses to specific sites.

605-8.3.4.5.2 The incident commander shall identify the procedures for presenting a safety briefing prior to allowing personnel to work on a hazardous materials/WMD incident.

1. Orient personnel to the scene
2. Identify objectives
3. Identify scene safety and health considerations
4. Designate a safety officer
5. Identify emergency medical care procedures – ICS 206 Medical Plan

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6. Establish environmental monitoring
7. Identify emergency procedures
 - a. Communications plan
 - b. Safe havens
 - c. Back-up team
 - d. Buddy system
 - e. Establish decon plan – have technical decon and emergency decon procedures in place
 - f. Identify SOPs and other safe work practices that apply
8. Conduct personnel monitoring
 - a. Pre and post entry medical screening
 - b. Personnel accountability

605-8.3.4.5.3 The incident commander shall identify at least three safety precautions associated with search and rescue missions at hazardous materials/WMD incidents.

1. Buddy system
2. Back up team
3. PPE requirements - based on scene size up and the hazard and risk analysis

605-8.3.4.5.4 The incident commander shall identify the advantages and limitations of the following and describe an example where each decontamination method would be used:

1. Absorption
2. Adsorption
3. Chemical degradation
4. Dilution
5. Disinfection
6. Evaporation
7. Isolation and disposal
8. Neutralization
9. Solidification
10. Sterilization

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11. Vacuuming

12. Washing

605-8.3.4.5.5 The incident commander shall identify the atmospheric and physical safety hazards associated with hazardous materials/WMD incidents involving confined spaces.

1. Atmospheric hazards
 - a. Oxygen-deficient atmosphere
 - b. Oxygen-enriched atmosphere
 - c. Flammable and explosive atmospheres
 - d. Toxic atmosphere
2. Physical hazards
 - a. Engulfment hazards
 - b. Falls and slips
 - c. Electrical hazards
 - d. Structural hazards
 - i. Limited egress
 - ii. Extended travel distances
 - iii. Darkness
 - e. Mechanical hazards
 - f. Poor communications

605-8.4 **Competencies — Implementing the Planned Response**

605-8.4.1 **Implementing an Incident Command System**

Given a copy of the emergency response plan and annexes related to hazardous materials/WMD, the incident commander shall identify the requirements of the plan, including the procedures for notification and utilization of nonlocal resources (private, state, and federal government personnel), and shall meet the following requirements:

1. Identify the role of the incident commander during a hazardous materials/WMD incident.
 - a. The incident commander (IC) shall be that person responsible for all incident activities, including the development of strategies and tactics and the ordering and release of resources.
 - b. The incident commander is the responder in charge of a single command ICS structure.
2. Describe the concept of unified command and its application and use at a hazardous materials/WMD incident.
 - a. Unified command involves establishing a unified command team of command-level representatives from each of the primary responding agencies that develop strategies and tactics and authorize the ordering and release of resources.

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- b. Unified command team shares command responsibilities but the responsible party plays the lead role.
3. Identify the duties and responsibilities of the following hazardous materials branch/group functions within the incident command system:
 - a. Decontamination
 - b. Entry (backup)
 - c. Hazardous materials branch director or group supervisor
 - d. Hazardous materials safety
 - e. Information and research
4. Identify the steps for implementing the emergency response plans required under Title III Emergency Planning and Community Right-to-Know Act (EPCRA) of the Superfund Amendments and Reauthorization Act (SARA) Section 303, or other state and emergency response planning legislation.
 - a. An event occurs
 - b. The emergency management/response system is activated
 - c. Responders respond to the scene
 - d. The local, state, federal, or facility response plan is implemented per AHJ
5. Given the emergency response planning documents, identify the elements of each of the documents.
 - a. Facility emergency response plans
 - b. Pre-incident tactical plans
 - c. Published emergency response references
 - d. Shipping documents
6. Identify the elements of the incident management system necessary to coordinate response activities at hazardous materials/WMD incidents.
 - a. Command staff
 - i. Incident commander
 - ii. Incident Safety Officer
 - iii. Public Information Officer
 - iv. Liaison Officer
 - b. General Staff
 - i. Operations Section Chief
 - a) Hazardous Materials Branch or Group
 - 1) Primary hazardous materials group or branch functions include:
 - i) Hazardous materials branch/group supervision (Hazardous Materials Branch Director/Group Supervisor)
 - ii) Safety (Assistant Safety Officer – Hazardous Materials)
 - iii) Site Access Control (Site Access Control Unit Leader)

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- (a) Establishes Hazard Control Zones
 - (b) Manages Safe Refuge Area
 - iv) Entry Team Operations (Entry Team Leader)
 - (a) Recon team
 - (b) Entry team(s)
 - (c) Back-up team
 - v) Decontamination (Decon Team Leader)
 - vi) Information/research coordination (Information/Research Team Leader)
 - (a) Technical/Product Specialist
 - (b) Environmental/Remediation Contractors
 - (c) Governmental or External Agency Liaisons
 - 2) Secondary hazardous materials group or branch functions include:
 - i) Resources/logistics
 - ii) Medical (Medical Unit Leader)
 - iii) Incident rehabilitation (Rehabilitation Unit Leader)
 - iv) The above secondary functions are performed by the Hazardous Materials Branch/Group only if they are not being performed by the logistics section, i.e., logistics section has not been activated.
 - ii. Planning Section Chief – as applicable
 - iii. Logistics Section Chief – as applicable
 - iv. Finance/Admin. Section Chief – as applicable
- 7. Identify the primary government agencies and identify the scope of their regulatory authority (including the regulations) pertaining to the production, transportation, storage, and use of hazardous materials and the disposal of hazardous wastes.
 - a. Federal
 - i. DHS – Department of Homeland Security
 - ii. DOT – Department of Transportation
 - iii. EPA – Environmental Protection Agency
 - iv. FAA – Federal Aviation Administration
 - v. NRC – Nuclear Regulatory Commission
 - vi. OSHA – Occupational Safety and Health Administration
 - vii. USCG – United States Coast Guard
 - b. State
 - i. DPS – Department of Public Safety
 - ii. Railroad Commission

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- iii. TCEQ – Texas Commission on Environmental Quality
 - iv. TDSHS – Texas Department of State Health Services
 - v. TGLO – Texas General Land Office
 - vi. TXDOT – Texas Department of Transportation
 - c. Local
 - i. Local emergency management
 - ii. Local county/municipal agencies
8. Identify the governmental agencies and resources that can offer assistance during a hazardous materials/WMD incident and identify their role and the type of assistance or resources that might be available.
- a. Federal
 - i. DHS - Homeland Security Issues
 - ii. FBI - Crisis Management
 - iii. FEMA - Consequence Management
 - iv. EPA - Environmental Management
 - v. US Coast Guard - Navigable Waterway Management & Port Security
 - vi. DOD - Explosives, Munitions, Military Shipments Technical Assistance/Response
 - vii. ATF - Explosives Technical Assistance
 - b. State
 - i. DPS - District Disaster Chair (DDC)
 - ii. TDEM - Emergency Management
 - iii. TCEQ - Environmental Management
 - iv. TGLO - Water Quality
 - v. TRRC - Pipelines and Propane Storage
 - c. Local
 - i. Local emergency management
 - ii. Local fire department
 - iii. Local police department
 - iv. EMS providers

605-8.4.2 **Directing Resources (Private and Governmental)**

Given a scenario involving a hazardous materials/WMD incident and the necessary resources to implement the planned response, the incident commander shall demonstrate the ability to direct the resources in a safe and efficient manner consistent with the capabilities of those resources.

Criteria and factors should include the following:

1. Task assignment (based on strategic and tactical options)
2. Operational safety
3. Operational effectiveness
4. Planning support

5. Logistics support
6. Administrative support

605-8.4.3 **Providing a Focal Point for Information Transfer to the Media and Elected Officials**

Given a scenario involving a hazardous materials/WMD incident, the incident commander shall identify information to be provided to the media and local, state, and federal officials and shall complete the following tasks:

1. Identify the local policy for providing information to the media. (AHJ)
2. Identify the responsibilities of the public information officer at a hazardous materials/WMD incident.
3. Describe the concept of a joint information center (JIC) and its application and use at a hazardous materials/WMD incident.

605-8.5 **Competencies — Evaluating Progress**

605-8.5.1 **Evaluating Progress of the Incident Action Plan**

Given scenarios involving hazardous materials/WMD incidents, the incident commander shall evaluate the progress of the incident action plan to determine whether the efforts are accomplishing the response objectives and shall complete the following tasks:

1. Identify the procedures for evaluating whether the response options are effective in accomplishing the objectives.
 - a. Evaluate the effectiveness of the response based on:
 - i. Are the IAP objectives being met?
 - ii. What problems have arisen?
 - b. Revise or modify the incident action plan based on identified needs
 - c. Reevaluate the effectiveness of the revised IAP
 - d. Continually monitor the effectiveness of the IAP
2. Identify the steps for comparing actual behavior of the material and the container to that predicted in the analysis process.

Identifying and predicting material and container behavior can be done utilizing the General Hazardous Materials Behavior Model which includes identifying the following:

- a. Stress event
 - i. Thermal stress
 - ii. Mechanical stress
 - iii. Chemical stress
- b. Breach event
 - i. Disintegration
 - ii. Runaway Cracking

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- iii. Failure of Container Attachments
 - iv. Container Punctures
 - v. Container Splits or Tears
 - c. Release event
 - i. Detonation
 - ii. Violent Rupture
 - iii. Rapid Relief
 - iv. Spills or Leaks
 - d. Engulfing event
 - i. Identify the hazardous material or the energy likely to engulf the area
 - ii. What form is the energy or matter in?
 - iii. What is making it move?
 - iv. What path will it follow?
 - v. What type of dispersion pattern will it create?
 - a) Cloud
 - b) Cone
 - c) Plume
 - d) Stream
 - e) Irregular
 - e. Impingement event (typically categorized based on duration)
 - i. Harmful characteristics of material
 - ii. Concentration of the hazardous material
 - iii. Duration of the impingement
 - iv. Characteristics of the exposure
 - f. Harm event
 - i. Thermal
 - ii. Toxicity/poison
 - iii. Radiation
 - iv. Asphyxiation
 - v. Corrosivity
 - vi. Etiological
 - vii. Mechanical
3. Determine the effectiveness of the following:
- a. Control, containment, or confinement operations
 - b. Decontamination process
 - c. Established control zones
 - d. Personnel being used
 - e. Personal protective equipment
4. Make modifications to the incident action plan as necessary.

605-8.6 **Competencies — Terminating the Incident**

605-8.6.1 **Transferring Command and Control**

Given a scenario involving a hazardous materials/WMD incident, the emergency response plan, and standard operating procedures, the incident commander shall

be able to identify the steps to be taken to transfer command and control of the incident and shall be able to demonstrate the transfer of command and control.

605-8.6.2 **Conducting a Debriefing**

Given scenarios involving a hazardous materials/WMD incident, the incident commander shall conduct a debriefing of the incident and shall complete the following tasks:

An effective debriefing should address the following informational issues regarding response activities:

- Positive aspects – Identify strengths or things that went well that need to be maintained or continued
 - Negative aspects – Identify weaknesses that went poorly and need to be corrected
 - Unique aspects – Unusual or unsuspected conditions that may need to be addressed or planned for
1. Describe three components of an effective debriefing.
 - a. Inform responders of the potential signs and symptoms of any possible hazardous materials exposures
 - b. Identify:
 - i. Damaged equipment
 - ii. Expended supplies
 - iii. Items that need to be disposed
 - iv. Unsafe site conditions
 - c. Assign:
 - i. information gathering responsibilities for a post-incident analysis and critique
 - ii. Point of contact for any follow up on incident related issues
 - d. Assess the need for Critical Incident Stress Debriefing (CISD)
 2. Describe the key topics in an effective debriefing.
 - a. Health information
 - b. Equipment and apparatus exposure review
 - c. A follow-up contact person
 - d. Problems requiring immediate action
 - e. Thank you!
 3. Describe when a debriefing should take place.
 - a. As soon as the “emergency phase” of the incident is over
 - b. Should be before any responders leave the scene
 4. Describe who should be involved in a debriefing.
 - a. Hazardous Materials Response Team
 - b. Incident Commander
 - c. Section Chiefs/Branch Directors/Division and Group Supervisors, etc.
 - d. Information Officer

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- e. Agency representatives or key players as determined by the Incident Commander (i.e. Safety Officer and Agency Liaisons)
5. Identify the procedures for conducting incident debriefings at a hazardous materials/WMD incident.

605-8.6.3 **Conducting a Critique**

Given details of a scenario involving a multiagency hazardous materials/WMD incident, the incident commander shall conduct a critique of the incident and shall complete the following tasks:

1. Describe three components of an effective critique.
 - a. Direction
 - b. Participation
 - c. Solutions
2. Describe who should be involved in a critique.
 - a. Hazardous Materials Response Team
 - b. Incident Commander
 - c. Section Chiefs/Branch Directors/Division and Group Supervisors, etc.
 - d. Information Officer
 - e. Agency representatives or key players as determined by the Incident Commander (i.e. Safety Officer and Agency Liaisons)
3. Describe why an effective critique is necessary after a hazardous materials/WMD incident.
 - a. Develop recommendations for improving the emergency response team
 - b. Promotes systems-dependent operations rather than people-dependent organizations
 - c. Promotes a willingness to cooperate through teamwork
 - d. Promotes improvement of safe operating procedures
 - e. Promotes sharing of information among emergency response organizations
4. Describe what written documents should be prepared as a result of the critique.
 - a. Post-Critique Report
 - b. Formal-Critique Report
5. Implement the procedure for conducting a critique of the incident.

605-8.6.4 **Reporting and Documenting the Hazardous Materials/WMD Incident**

Given a scenario involving a hazardous materials/WMD incident, the incident commander shall demonstrate the ability to report and document the incident consistent with local, state, and federal requirements and shall complete the following tasks:

1. Identify the reporting requirements of the federal, state, and local agencies.
 - a. Incident action plan and all components
 - b. Site safety plan and all components
 - c. Other documentation required by AHJ
2. Identify the importance of the documentation for a hazardous materials/WMD incident, including training records, exposure records, incident reports, and critique reports.
3. Identify the steps in keeping an activity log and exposure records for hazardous materials/WMD incidents.
 - a. Activity log
 - i. Record major event(s)
 - ii. Record time major event(s) occurred
 - iii. Briefly describe major event(s)
 - iv. Additional information to include
 - a) Information that may assist in the investigation or cost recovery process
 - b) Task assignments
 - c) Task completion
 - d) Injuries and exposures
 - b. Exposure records
 - i. General information
 - a) Name of exposed worker
 - b) Personal ID number
 - c) Assignment/station
 - d) Incident date
 - e) Incident number
 - f) Incident location
 - ii. Nature of incident
 - iii. Level of personal protection
 - iv. Emergency response activity
 - v. Exposure data
 - a) Method of exposure
 - b) Duration of exposure
 - vi. Medical treatment provided
 - a) Signs and symptoms
 - b) On-scene medical treatment
 - c) Medical facility treatment
 - d) Follow-up action required
 - vii. Medical treatment provided
 - a) Comment section
 - b) Individual's signature and date
 - c) Officer's signature and date
4. Identify the requirements for compiling hazardous materials/WMD incident reports found in the emergency response plan or standard operating procedures.

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5. Identify the requirements for filing documents and maintaining records found in the emergency response plan or standard operating procedures.
6. Identify the procedures required for legal documentation and chain of custody and continuity described in the standard operating procedures or the emergency response plan.

Possible Reference(s):

***Noll, et al, Haz Mat: Managing the Incident, 3rd ed., Red Hat Publishing
Hawley, C., Haz Mat Incidents, 3rd ed., Delmar, 2008***

REFERENCE LIST FOR THE HAZARDOUS MATERIALS OPERATIONS - MISSION SPECIFIC COMPETENCIES CURRICULUM

This Reference List is provided as a general guide for both instructors and students to locate information pertaining to the specific objectives in the TCFP Curriculum. This list is **not** all-inclusive and does not in any way limit TCFP development and use of questions to test the objectives of the curriculum:

Required References

Texts

Certification Curriculum Manual. Texas Commission on Fire Protection. (Most current edition). Austin, TX: Texas Commission on Fire Protection.

Code of Federal Regulations, Title 29 Part 1910.120, Appendix A. United States. U.S. Department of Labor, Occupational Safety & Health Administration.
http://edocket.access.gpo.gov/cfr_2007/julqtr/pdf/29cfr1910.120.pdf

Emergency Response Guidebook. United States. (Most current edition). Washington, DC: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration.

Essentials of Fire Fighting, 5th edition. International Fire Service Training Association. (2008). Stillwater, OK: Fire Protection Publications, Oklahoma State University.

Fire Fighter's Handbook of Hazardous Materials, 7th edition. Baker, Charles T., (2006). Sudbury, MA: Jones and Bartlett.

Firefighter's Handbook: Essentials of Firefighting and Emergency Response, 3rd edition. Delmar Publishers. (2008). Clifton Park, NY: Delmar, Cengage Learning.

Fundamentals of Fire Fighter Skills, 2nd edition. International Association of Fire Chiefs, & National Fire Protection Association. (2008). Sudbury, MA: Jones and Bartlett.

Hazardous Materials Awareness and Operations. DeBobes, L. J. (2009). Sudbury, MA: Jones & Bartlett.

Hazardous Materials for First Responders, 3rd edition. Adams, B., & Miller, L. A. (2004). Stillwater, OK: Fire Protection Publications, Oklahoma State University.

Hazardous Materials: Managing the Incident. Chester Noll, G. G., Hildebrand, M. S., & Yvorra, J. G. (2005). MD: Red Hat Publishing, Inc.

Hazardous Materials/Weapons of Mass Destruction Response Handbook, 5th edition. Trebisacci, D. G. (2008). Quincy, MA: National Fire Protection Association.

NFPA 472: Standard for Professional Competence of Responders to Hazardous Materials Incidents. (2008). Quincy, MA: NFPA Publications. National Fire Protection Association

NIOSH Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and

Health. (Most current edition). Cincinnati, OH: US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. <http://www.cdc.gov/niosh/npg/>

Standards Manual for Fire Protection Personnel. Texas Commission on Fire Protection. (Most current edition). Austin, TX: Texas Commission on Fire Protection.

Recommended References

The most current edition of the following publications and media are recommended (not required) supplemental material for program use.

Texts

Bretherick's Handbook of Reactive Chemical Hazards. Urban, P. G., Pitt, M. J., & Bretherick, L. (2007). Amsterdam: Elsevier.

Chlorine Emergencies: An Overview for First Responders. Chlorine Institute. (2007). Arlington, VA: The Chlorine Institute.

CHRIS: Chemical Hazards Response Information System. United States. (1992). COMDTINST, M16465.11B. Washington, DC: U.S. Dept. of Transportation, U.S. Coast Guard.

Emergency Action Guides. Association of American Railroads. (2006). Pueblo, CO: Association of American Railroads.

Emergency Care for Hazardous Materials Exposure. Currance, P., Bronstein, A. C., & Clements, B. (2005). St. Louis, MO: Mosby.

Emergency Handling of Hazardous Materials in Surface Transportation. Association of American Railroads. (2009). Washington, DC: Association of American Railroads.

Field Guide to Tank Car Identification. Association of American Railroads. (2009). Washington, DC: Association of American Railroads.

Fire Protection Guide to Hazardous Materials. National Fire Protection Association. (2001). Quincy, MA: National Fire Protection Association.

Hawley's Condensed Chemical Dictionary. Lewis, R. J., & Hawley, G. G. (2007). West Sussex: Wiley.

Hazardous Materials Air Monitoring and Detection Devices. Hawley, C. (2002). Albany, NY: Delmar/Thomson Learning.

Hazardous Materials Field Guide, 2nd edition. Bevelacqua, A. S., & Stilp, R. H. (2007). Albany, NY: Delmar Publications.

Hazardous Materials: Managing the Incident Field Operations Guide. Chester Bevelacqua, A. S., Hildebrand, M. S., & Noll, G. G. (2005). MD: Red Hat Publishing, Inc.

How to Use the Chlorine Institute Emergency Kit "A" for 100 lb. and 150 lb. Chlorine Cylinders. Chlorine Institute. (1996). New York, NY: The Chlorine Institute.

How to Use the Chlorine Institute Emergency Kit "B" for Chlorine Ton Containers. Chlorine Institute. (1988). New York, NY: The Chlorine Institute.

How to Use the Chlorine Institute Emergency Kit "C" for Chlorine Tank Cars and Tank Trucks. Chlorine Institute. (1993). New York, NY: The Chlorine Institute.

Symbol Seeker: Hazard Identification Manual. Burns, P. P. (2002). Preston, England: Symbol Seeker.

Media

Hazardous Materials Containment Series. Action Training Systems. [4 Disc DVD Set] Hazardous materials containment - series of 4 titles. Seattle, WA: Action Training Systems.

Hazardous Materials: Managing the Incident DVD Series. Massingham, G., Noll, G. G., Hildebrand, M. S., & Noll, G. G. (2005). [8 Disc DVD Set] Edgartown, MA: Emergency Film Group.

**CHAPTER 6
 SECTION 603
 HAZARDOUS MATERIALS OPERATIONS - MISSION SPECIFIC COMPETENCIES
 CURRICULUM OUTLINES**

SECTION	SUBJECT	RECOMMENDED HOURS
603-6.1	General - Introduction - Laws, Regulations, and National Consensus Standards	1
603-6.2	Mission Specific Competencies: Personal Protective Equipment	8
603-6.3	Mission Specific Competencies: Mass Decontamination	8
603-6.4	Mission Specific Competencies: Technical Decontamination	8
603-6.5	Mission Specific Competencies: Evidence Preservation and Sampling	8
603-6.6	Mission Specific Competencies: Product Control	8
603-6.7	Mission Specific Competencies: Air Monitoring and Sampling	8
603-6.8	Mission Specific Competencies: Victim Rescue and Recovery	8
603-6.9	Mission Specific Competencies: Response to Illicit Laboratory Incidents	16

Mission Specific - Personal Protective Equipment		
SECTION	SUBJECT	RECOMMENDED HOURS
603-6.2	Mission Specific Competencies: Personal Protective Equipment	
603-6.2.1	General - Introduction - Laws, Regulations, and National Consensus Standards	1
603-6.2.2	Analyzing the Incident - Reserved - None Required at this Level	
603-6.2.3	Planning the Response	3
603-6.2.4	Implementing the Planned Response	3
603-6.2.5	Terminating the Incident	1
TOTAL RECOMMENDED HOURS		8

Mission Specific - Mass Decontamination		
SECTION	SUBJECT	RECOMMENDED HOURS
603-6.3	Mission Specific Competencies: Mass Decontamination	
603-6.3.1	General - Introduction - Laws, Regulations, and National Consensus Standards	1
603-6.3.2	Analyzing the Incident - Reserved - None Required at this Level	
603-6.3.3	Planning the Response	2
603-6.3.4	Implementing the Planned Response	3
603-6.3.5	Evaluating Progress	1
603-6.3.6	Terminating the Incident	1
TOTAL RECOMMENDED HOURS		8

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Mission Specific - Technical Decontamination		
SECTION	SUBJECT	RECOMMENDED HOURS
603-6.4	Mission Specific Competencies: Technical Decontamination	
603-6.4.1	General - Introduction - Laws, Regulations, and National Consensus Standards	1
603-6.4.2	Analyzing the Incident - Reserved - None Required at this Level	
603-6.4.3	Planning the Response	2
603-6.4.4	Implementing the Planned Response	3
603-6.4.5	Evaluating Progress	1
603-6.4.6	Terminating the Incident	1
	TOTAL RECOMMENDED HOURS	8

Mission Specific - Evidence, etc.		
SECTION	SUBJECT	RECOMMENDED HOURS
603-6.5	Mission Specific Competencies: Evidence Preservation and Sampling	
603-6.5.1	General - Introduction - Laws, Regulations, and National Consensus Standards	1
603-6.5.2	Analyzing the Incident	1
603-6.5.3	Planning the Response	2
603-6.5.4	Implementing the Planned Response	4
603-6.5.5	Evaluating Progress - Reserved - None Required at this Level	
603-6.5.6	Terminating the Incident - Reserved - None Required at this Level	
	TOTAL RECOMMENDED HOURS	8

Mission Specific - Evidence, etc.		
SECTION	SUBJECT	RECOMMENDED HOURS
603-6.6	Mission Specific Competencies: Evidence Preservation and Sampling	
603-6.6.1	General - Introduction - Laws, Regulations, and National Consensus Standards	1
603-6.6.2	Analyzing the Incident - Reserved - None Required at this Level	
603-6.6.3	Planning the Response	2
603-6.6.4	Implementing the Planned Response	5
603-6.6.5	Evaluating Progress - Reserved - None Required at this Level	
603-6.6.6	Terminating the Incident - Reserved - None Required at this Level	
	TOTAL RECOMMENDED HOURS	8

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Mission Specific - Air Monitoring, etc.		
SECTION	SUBJECT	RECOMMENDED HOURS
603-6.7	Mission Specific Competencies: Air Monitoring and Sampling	
603-6.7.1	General - Introduction - Laws, Regulations, and National Consensus Standards	1
603-6.7.2	Analyzing the Incident - Reserved - None Required at this Level	
603-6.7.3	Planning the Response	4
603-6.7.4	Implementing the Planned Response	3
603-6.7.5	Evaluating Progress - Reserved - None Required at this Level	
603-6.7.6	Terminating the Incident - Reserved - None Required at this Level	
TOTAL RECOMMENDED HOURS		8

Mission Specific - Victim, etc.		
SECTION	SUBJECT	RECOMMENDED HOURS
603-6.8	Mission Specific Competencies: Victim Rescue and Recovery	
603-6.8.1	General - Introduction - Laws, Regulations, and National Consensus Standards	1
603-6.8.2	Analyzing the Incident - Reserved - None Required at this Level	
603-6.8.3	Planning the Response	3
603-6.8.4	Implementing the Planned Response	4
603-6.8.5	Evaluating Progress - Reserved - None Required at this Level	
603-6.8.6	Terminating the Incident - Reserved - None Required at this Level	
TOTAL RECOMMENDED HOURS		8

Mission Specific - Response, etc.		
SECTION	SUBJECT	RECOMMENDED HOURS
603-6.9	Mission Specific Competencies: Response to Illicit Laboratory Incidents	
603-6.9.1	General - Introduction - Laws, Regulations, and National Consensus Standards	1
603-6.9.2	Analyzing the Incident	4
603-6.9.3	Planning the Response	6
603-6.9.4	Implementing the Planned Response	5
603-6.9.5	Evaluating Progress - Reserved - None Required at this Level	
603-6.9.6	Terminating the Incident - Reserved - None Required at this Level	
TOTAL RECOMMENDED HOURS		16

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The recommended hours include time for skills evaluation and are based on 12 students. Hours needed depend on the actual number of students.

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SECTION 603
HAZARDOUS MATERIALS OPERATIONS
MISSION SPECIFIC COMPETENCIES

Hazardous Materials Operations – Mission Specific Competencies are optional job performance requirements (JPRs) which may be adopted by the authority having jurisdiction (AHJ). These JPRs may be adopted in whole or in part for the Operations Level Responders to perform.

Hazardous Materials Operations Level Responders trained to perform Mission Specific Competencies must first master all the job performance requirements and knowledge, skills and abilities pertaining to:

- Awareness Level Personnel, and
- Operations Level Responders.

The Operations Level Responder may be required to perform any combination of the following Operations level mission specific tasks by the authority having jurisdiction (AHJ):

- Use personal protective equipment, as provided by the AHJ
- Perform technical decontamination
- Perform mass decontamination
- Perform product control
- Perform air monitoring and sampling
- Perform victim rescue and recovery operations
- Evidence preservation and sampling
- Respond to illicit laboratory incidents

Operations level mission specific tasks must be performed under the supervision and guidance of a hazardous materials technician, allied professional, or established standard operating procedure.

Note: In order to successfully complete the Texas Commission on Fire Protection’s Basic Structure Firefighter curriculum, all the job performance requirements and knowledge, skills and abilities must be mastered pertaining to:

- **Awareness Level Personnel**
- **Operations Level Responders, and**
- **Hazardous Materials Operations Level – Mission Specific Competencies of:**
 - **Using Personal Protective Equipment and**
 - **Performing Product Control.**

This is in accordance with the competency requirements of *NFPA 1001: Standard for Fire Fighter Professional Qualifications 2008 Ed.*, the *TCFP Standards Manual* and the *TCFP Curriculum Manual*.

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603-6.1

General

603-6.1.1

Introduction

603-6.1.1.1

This chapter shall address competencies for the following operations level responders assigned mission-specific responsibilities at hazardous materials/WMD incidents by the authority having jurisdiction beyond the core competencies at the operations level (Section 602):

1. Operations level responders assigned to use personal protective equipment
2. Operations level responders assigned to perform mass decontamination
3. Operations level responders assigned to perform technical decontamination
4. Operations level responders assigned to perform evidence preservation and sampling
5. Operations level responders assigned to perform product control
6. Operations level responders assigned to perform air monitoring and sampling
7. Operations level responders assigned to perform victim rescue/recovery
8. Operations level responders assigned to respond to illicit laboratory incidents

603-6.1.1.2

The operations level responder who is assigned mission-specific responsibilities at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (Section 601), all core competencies at the operations level (Section 602), and all competencies for the assigned responsibilities in the applicable section(s) in this chapter.

603-6.1.1.3

The operations level responder who is assigned mission-specific responsibilities at hazardous materials/WMD incidents shall receive additional training to meet applicable governmental occupational health and safety regulations.

603-6.1.1.4

The operations level responder who is assigned mission-specific responsibilities at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, an emergency response plan, or standard operating procedures.

603-6.1.1.5 The development of assigned mission-specific knowledge and skills shall be based on the tools, equipment, and procedures provided by the AHJ for the mission-specific responsibilities assigned.

603-6.1.2 **Goal**
The goal of the competencies in this chapter shall be to provide the operations level responder assigned mission-specific responsibilities at hazardous materials/WMD incidents by the AHJ with the knowledge and skills to perform the assigned mission-specific responsibilities safely and effectively.

603-6.1.3 **Mandating of Competencies**
This standard shall not mandate that the response organizations perform mission-specific responsibilities.

603-6.1.3.1 Operations level responders assigned mission-specific responsibilities at hazardous materials/WMD incidents, operating within the scope of their training in this chapter, shall be able to perform their assigned mission-specific responsibilities.

603-6.1.3.2 If a response organization desires to train some or all of its operations level responders to perform mission-specific responsibilities at hazardous materials/WMD incidents, the minimum required competencies shall be as set out in this chapter.

603-6.2 **Mission-Specific Competencies: Personal Protective Equipment**

603-6.2.1 **General**

603-6.2.1.1 **Introduction**

603-6.2.1.1.1 The operations level responder assigned to use personal protective equipment shall be that person, competent at the operations level, who is assigned to use of personal protective equipment at hazardous materials/WMD incidents.

603-6.2.1.1.2 The operations level responder assigned to use personal protective equipment at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (Section 601), all core competencies at the operations level (Section 602), and all competencies in this section.

603-6.2.1.1.3 The operations level responder assigned to use personal protective equipment at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

603-6.2.1.1.4 The operations level responder assigned to use personal protective equipment shall receive the additional training necessary to meet specific needs of the jurisdiction.

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603-6.2.1.2

Goal

The goal of the competencies in this section shall be to provide the operations level responder assigned to use personal protective equipment with the knowledge and skills to perform the following tasks safely and effectively:

1. Plan a response within the capabilities of personal protective equipment provided by the AHJ in order to perform mission specific tasks assigned.
2. Implement the planned response consistent with the standard operating procedures and site safety and control plan by donning, working in, and doffing personal protective equipment provided by the AHJ.
3. Terminate the incident by completing the reports and documentation pertaining to personal protective equipment.

603-6.2.2

Competencies — Analyzing the Incident (Reserved)

603-6.2.3

Competencies — Planning the Response

603-6.2.3.1

Selecting Personal Protective Equipment

Given scenarios involving hazardous materials/WMD incidents with known and unknown hazardous materials/WMD, the operations level responder assigned to use personal protective equipment shall select the personal protective equipment required to support mission-specific tasks at hazardous materials/WMD incidents based on local procedures and shall meet the following requirements:

1. Describe the types of protective clothing and equipment that are available for response based on NFPA standards and how these items relate to EPA levels of protection.
2. Describe personal protective equipment options for the following hazards:
 - a. Thermal
 - b. Radiological
 - c. Asphyxiating
 - d. Chemical
 - e. Etiological/biological
 - f. Mechanical
3. Select personal protective equipment for mission-specific tasks at hazardous materials/WMD incidents based on local procedures.
 - a. Describe the following terms and explain their impact and significance on the selection of chemical-protective clothing:
 - i. Degradation

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- ii. Penetration
- iii. Permeation
- b. Identify at least three indications of material degradation of chemical-protective clothing.
- c. Identify the different designs of vapor-protective and splash-protective clothing and describe the advantages and disadvantages of each type.
- d. Identify the relative advantages and disadvantages of the following heat exchange units used for the cooling of personnel operating in personal protective equipment:
 - i. Air cooled
 - ii. Ice cooled
 - iii. Water cooled
 - iv. Phase change cooling technology
- e. Identify the physiological and psychological stresses that can affect users of personal protective equipment.
- f. Describe local procedures for going through the technical decontamination process.

603-6.2.4 **Competencies — Implementing the Planned Response**

603-6.2.4.1 **Using Protective Clothing and Respiratory Protection**

Given the personal protective equipment provided by the AHJ, the operations level responder assigned to use personal protective equipment shall demonstrate the ability to don, work in, and doff the equipment provided to support mission-specific tasks and shall meet the following requirements:

1. Describe at least three safety procedures for personnel wearing protective clothing.
2. Describe at least three emergency procedures for personnel wearing protective clothing.
3. Demonstrate the ability to don, work in, and doff personal protective equipment provided by the AHJ.
4. Demonstrate local procedures for responders undergoing the technical decontamination process.
5. Describe the maintenance, testing, inspection, storage, and documentation procedures for personal protective equipment provided by the AHJ according to the manufacturer's specifications and recommendations.

603-6.2.5 **Competencies — Terminating the Incident**

603-6.2.5.1 **Reporting and Documenting the Incident**

Given a scenario involving a hazardous materials/WMD incident, the operations level responder assigned to use personal protective equipment

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shall identify and complete the reporting and documentation requirements consistent with the emergency response plan or standard operating procedures regarding personal protective equipment.

603-6.3 **Mission-Specific Competencies: Mass Decontamination**

603-6.3.1 **General**

603-6.3.1.1 **Introduction**

603-6.3.1.1.1 The operations level responder assigned to perform mass decontamination at hazardous materials/WMD incidents shall be that person, competent at the operations level, who is assigned to implement mass decontamination operations at hazardous materials/WMD incidents.

603-6.3.1.1.2 The operations level responder assigned to perform mass decontamination at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (Section 601), all core competencies at the operations level (Section 602), all mission-specific competencies for personal protective equipment (Section 603-6.2), and all competencies in this section.

603-6.3.1.1.3 The operations level responder assigned to perform mass decontamination at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

603-6.3.1.1.4 The operations level responder assigned to perform mass decontamination at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

603-6.3.1.2 **Goal**

603-6.3.1.2.1 The goal of the competencies in this section shall be to provide the operations level responder assigned to perform mass decontamination at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks in 6.3.1.2.2 safely and effectively.

603-6.3.1.2.2 When responding to hazardous materials/WMD incidents, the operations level responder assigned to perform mass decontamination shall be able to perform the following tasks:

1. Plan a response within the capabilities of available personnel, personal protective equipment, and control equipment by selecting a mass decontamination process to minimize the hazard.
2. Implement the planned response to favorably change the outcomes consistent with standard operating procedures and the site safety and control plan by completing the following tasks:

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- a. Perform the decontamination duties as assigned.
 - b. Perform the mass decontamination functions identified in the incident action plan.
3. Evaluate the progress of the planned response by evaluating the effectiveness of the mass decontamination process.
 4. Terminate the incident by providing reports and documentation of decontamination operations.

603-6.3.2 **Competencies — Analyzing the Incident (Reserved)**

603-6.3.3 **Competencies — Planning the Response**

603-6.3.3.1 **Selecting Personal Protective Equipment**

Given an emergency response plan or standard operating procedures, the operations level responder assigned to mass decontamination shall select the personal protective equipment required to support mass decontamination at hazardous materials/WMD incidents based on local procedures (see *Section 603-6.2*).

603-6.3.3.2 **Selecting Decontamination Procedures**

Given scenarios involving hazardous materials/WMD incidents, the operations level responder assigned to mass decontamination operations shall select a mass decontamination procedure that will minimize the hazard and spread of contamination, determine the equipment required to implement that procedure, and meet the following requirements:

1. Identify the advantages and limitations of mass decontamination operations.
2. Describe the advantages and limitations of each of the following mass decontamination methods:
 - a. Dilution
 - b. Isolation
 - c. Washing
3. Identify sources of information for determining the correct mass decontamination procedure and identify how to access those resources in a hazardous materials/WMD incident.
4. Given resources provided by the AHJ, identify the supplies and equipment required to set up and implement mass decontamination operations.
5. Identify procedures, equipment, and safety precautions for communicating with crowds and crowd management techniques that can be used at incidents where a large number of people might be contaminated.

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603-6.3.4 **Competencies — Implementing the Planned Response**

603-6.3.4.1 **Performing Incident Management Duties**

Given a scenario involving a hazardous materials/WMD incident and the emergency response plan or standard operating procedures, the operations level responder assigned to mass decontamination operations shall demonstrate the mass decontamination duties assigned in the incident action plan by describing the local procedures for the implementation of the mass decontamination function within the incident command system.

603-6.3.4.2 **Performing Decontamination Operations Identified in Incident Action Plan**

The operations level responder assigned to mass decontamination operations shall demonstrate the ability to set up and implement mass decontamination operations for ambulatory and nonambulatory victims.

603-6.3.5 **Competencies — Evaluating Progress**

603-6.3.5.1 **Evaluating the Effectiveness of the Mass Decontamination Process**

Given examples of contaminated items that have undergone the required decontamination, the operations level responder assigned to mass decontamination operations shall identify procedures for determining whether the items have been fully decontaminated according to the standard operating procedures of the AHJ or the incident action plan.

603-6.3.6 **Competencies — Terminating the Incident**

603-6.3.6.1 **Reporting and Documenting the Incident**

Given a scenario involving a hazardous materials/WMD incident, the operations level responder assigned to mass decontamination operations shall complete the reporting and documentation requirements consistent with the emergency response plan or standard operating procedures and shall meet the following requirements:

1. Identify the reports and supporting documentation required by the emergency response plan or standard operating procedures.
2. Describe the importance of personnel exposure records.
3. Identify the steps in keeping an activity log and exposure records.
4. Identify the requirements for filing documents and maintaining records.

603-6.4 **Mission-Specific Competencies: Technical Decontamination**

603-6.4.1 **General**

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603-6.4.1.1 **Introduction**

603-6.4.1.1.1 The operations level responder assigned to perform technical decontamination at hazardous materials/WMD incidents shall be that person, competent at the operations level, who is assigned to implement technical decontamination operations at hazardous materials/WMD incidents.

603-6.4.1.1.2 The operations level responder assigned to perform technical decontamination at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (Section 601), all core competencies at the operations level (Section 602), all mission-specific competencies for personal protective equipment (Section 603-6.2), and all competencies in this section.

603-6.4.1.1.3 The operations level responder assigned to perform technical decontamination at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

603-6.4.1.1.4 The operations level responder assigned to perform technical decontamination at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

603-6.4.1.2 **Goal**

603-6.4.1.2.1 The goal of the competencies in this section shall be to provide the operations level responder assigned to perform technical decontamination at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks in 6.4.1.2.2 safely and effectively.

603-6.4.1.2.2 When responding to hazardous materials/WMD incidents, the operations level responder assigned to perform technical decontamination shall be able to perform the following tasks:

1. Plan a response within the capabilities of available personnel, personal protective equipment, and control equipment by selecting a technical decontamination process to minimize the hazard.
2. Implement the planned response to favorably change the outcomes consistent with standard operating procedures and the site safety and control plan by completing the following tasks:
 - a. Perform the technical decontamination duties as assigned.
 - b. Perform the technical decontamination functions identified in the incident action plan.
3. Evaluate the progress of the planned response by evaluating the effectiveness of the technical decontamination process.

4. Terminate the incident by completing the providing reports and documentation of decontamination operations.

603-6.4.2 **Competencies — Analyzing the Incident (Reserved)**

603-6.4.3 **Competencies — Planning the Response**

603-6.4.3.1 **Selecting Personal Protective Equipment**

Given an emergency response plan or standard operating procedures, the operations level responder assigned to technical decontamination operations shall select the personal protective equipment required to support technical decontamination at hazardous materials/WMD incidents based on local procedures (see Section 603-6.2).

603-6.4.3.2 **Selecting Decontamination Procedures**

Given scenarios involving hazardous materials/WMD incidents, the operations level responder assigned to technical decontamination operations shall select a technical decontamination procedure that will minimize the hazard and spread of contamination and determine the equipment required to implement that procedure and shall meet the following requirements:

1. Identify the advantages and limitations of technical decontamination operations.
2. Describe the advantages and limitations of each of the following technical decontamination methods:
 - a. Absorption
 - b. Adsorption
 - c. Chemical degradation
 - d. Dilution
 - e. Disinfection
 - f. Evaporation
 - g. Isolation and disposal
 - h. Neutralization
 - i. Solidification
 - j. Sterilization
 - k. Vacuuming
 - l. Washing
3. Identify sources of information for determining the correct technical decontamination procedure and identify how to access those resources in a hazardous materials/WMD incident.
4. Given resources provided by the AHJ, identify the supplies and equipment required to set up and implement technical decontamination operations.

5. Identify the procedures, equipment, and safety precautions for processing evidence during technical decontamination operations at hazardous materials/WMD incidents.
6. Identify procedures, equipment, and safety precautions for handling tools, equipment, weapons, criminal suspects, and law enforcement/search canines brought to the decontamination corridor at hazardous materials/WMD incidents.

603-6.4.4 **Competencies — Implementing the Planned Response**

603-6.4.4.1 **Performing Incident Management Duties**

Given a scenario involving a hazardous materials/WMD incident and the emergency response plan or standard operating procedures, the operations level responder assigned to technical decontamination operations shall demonstrate the technical decontamination duties assigned in the incident action plan and shall meet the following requirements:

1. Identify the role of the operations level responder assigned to technical decontamination operations during hazardous materials/WMD incidents.
2. Describe the procedures for implementing technical decontamination operations within the incident command system.

603-6.4.4.2 **Performing Decontamination Operations Identified in Incident Action Plan**

The responder assigned to technical decontamination operations shall demonstrate the ability to set up and implement the following types of decontamination operations:

1. Technical decontamination operations in support of entry operations
2. Technical decontamination operations for ambulatory and nonambulatory victims

603-6.4.5 **Competencies — Evaluating Progress**

603-6.4.5.1 **Evaluating the Effectiveness of the Technical Decontamination Process**

Given examples of contaminated items that have undergone the required decontamination, the operations level responder assigned to technical decontamination operations shall identify procedures for determining whether the items have been fully decontaminated according to the standard operating procedures of the AHJ or the incident action plan.

603-6.4.6 **Competencies — Terminating the Incident**

603-6.4.6.1 **Reporting and Documenting the Incident**

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Given a scenario involving a hazardous materials/WMD incident, the operations level responder assigned to technical decontamination operations shall complete the reporting and documentation requirements consistent with the emergency response plan or standard operating procedures and shall meet the following requirements:

1. Identify the reports and supporting technical documentation required by the emergency response plan or standard operating procedures.
2. Describe the importance of personnel exposure records.
3. Identify the steps in keeping an activity log and exposure records.
4. Identify the requirements for filing documents and maintaining records.

603-6.5 **Mission-Specific Competencies: Evidence Preservation and Sampling**

603-6.5.1 **General**

603-6.5.1.1 **Introduction**

603-6.5.1.1.1 The operations level responder assigned to perform evidence preservation and sampling shall be that person, competent at the operations level, who is assigned to preserve forensic evidence, take samples, and/or seize evidence at hazardous materials/WMD incidents involving potential violations of criminal statutes or governmental regulations.

603-6.5.1.1.2 The operations level responder assigned to perform evidence preservation and sampling at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (Section 601), all core competencies at the operations level (Section 602), all mission-specific competencies for personal protective equipment (Section 603-6.2), and all competencies in this section.

603-6.5.1.1.3 The operations level responder assigned to perform evidence preservation and sampling at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

603-6.5.1.1.4 The operations level responder assigned to perform evidence preservation and sampling at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

603-6.5.1.2 **Goal**

603-6.5.1.2.1 The goal of the competencies in this section shall be to provide the operations level responder assigned to evidence preservation and sampling

at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks in 6.5.1.2.2 safely and effectively.

603-6.5.1.2.2

When responding to hazardous materials/WMD incidents involving potential violations of criminal statutes or governmental regulations, the operations level responder assigned to perform evidence preservation and sampling shall be able to perform the following tasks:

1. Analyze a hazardous materials/WMD incident to determine the complexity of the problem and potential outcomes by completing the following tasks:
 - a. Determine if the incident is potentially criminal in nature and identify the law enforcement agency having investigative jurisdiction.
 - b. Identify unique aspects of criminal hazardous materials/WMD incidents.
2. Plan a response for an incident where there is potential criminal intent involving hazardous materials/WMD within the capabilities and competencies of available personnel, personal protective equipment, and control equipment by completing the following tasks:
 - a. Determine the response options to conduct sampling and evidence preservation operations.
 - b. Describe how the options are within the legal authorities, capabilities, and competencies of available personnel, personal protective equipment, and control equipment.
3. Implement the planned response to a hazardous materials/WMD incident involving potential violations of criminal statutes or governmental regulations by completing the following tasks under the guidance of law enforcement:
 - a. Preserve forensic evidence.
 - b. Take samples.
 - c. Seize evidence.

603-6.5.2 **Competencies — Analyzing the Incident**

603-6.5.2.1 **Determining If the Incident Is Potentially Criminal in Nature and Identifying the Law Enforcement Agency That Has Investigative Jurisdiction**

Given examples of hazardous materials/WMD incidents involving potential criminal intent, the operations level responder assigned to evidence preservation and sampling shall describe the potential criminal violation and identify the law enforcement agency having investigative jurisdiction and shall meet the following requirements:

1. Given examples of the following hazardous materials/WMD incidents, the operations level responder shall describe products that might be encountered in the incident associated with each situation:

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- a. Hazardous materials/WMD suspicious letter
 - b. Hazardous materials/WMD suspicious package
 - c. Hazardous materials/WMD illicit laboratory
 - d. Release/attack with a WMD agent
 - e. Environmental crimes
2. Given examples of the following hazardous materials/WMD incidents, the operations level responder shall identify the agency(s) with investigative authority and the incident response considerations associated with each situation:
- a. Hazardous materials/WMD suspicious letter
 - b. Hazardous materials/WMD suspicious package
 - c. Hazardous materials/WMD illicit laboratory
 - d. Release/attack with a WMD agent
 - e. Environmental crimes

603-6.5.3

Competencies — Planning the Response

603-6.5.3.1

Identifying Unique Aspects of Criminal Hazardous Materials/WMD Incidents

The operations level responder assigned to evidence preservation and sampling shall be capable of identifying the unique aspects associated with illicit laboratories, hazardous materials/WMD incidents, and environmental crimes and shall meet the following requirements:

1. Given an incident involving illicit laboratories, a hazardous materials/WMD incident, or an environmental crime, the operations level responder shall perform the following tasks:
 - a. Describe the procedure to secure, characterize, and preserve the scene.
 - b. Describe the procedure to document personnel and scene activities associated with the incident.
 - c. Describe the procedure to determine whether the operations level responders are within their legal authority to perform evidence preservation and sampling tasks.
 - d. Describe the procedure to notify the agency with investigative authority.
 - e. Describe the procedure to notify the explosive ordnance disposal (EOD) personnel.
 - f. Identify potential sample/evidence.
 - g. Identify the applicable sampling equipment.
 - h. Describe the procedures to protect samples and evidence from secondary contamination.
 - i. Describe documentation procedures.
 - j. Describe evidentiary sampling techniques.
 - k. Describe field screening protocols for collected samples and evidence.
 - l. Describe evidence labeling and packaging procedures.
 - m. Describe evidence decontamination procedures.

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- n. Describe evidence packaging procedures for evidence transportation.
 - o. Describe chain-of-custody procedures.
2. Given an example of an illicit laboratory, the operations level responder assigned to evidence preservation and sampling shall be able to perform the following tasks:
 - a. Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident.
 - b. Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers.
 - c. Describe the sampling options associated with liquid and solid sample and evidence collection.
 - d. Describe the field screening protocols for collected samples and evidence.
 3. Given an example of an environmental crime, the operations level responder assigned to evidence preservation and sampling shall be able to perform the following tasks:
 - a. Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident.
 - b. Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers.
 - c. Describe the sampling options associated with the collection of liquid and solid samples and evidence.
 - d. Describe the field screening protocols for collected samples and evidence.
 4. Given an example of a hazardous materials/WMD suspicious letter, the operations level responder assigned to evidence preservation and sampling shall be able to perform the following tasks:
 - a. Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident.
 - b. Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers.
 - c. Describe the sampling options associated with the collection of liquid and solid samples and evidence.
 - d. Describe the field screening protocols for collected samples and evidence.
 5. Given an example of a hazardous materials/WMD suspicious package, the operations level responder assigned to evidence preservation and sampling shall be able to perform the following tasks:
 - a. Describe the hazards, safety procedures, decontamination, and tactical guidelines for this type of incident.

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- b. Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers.
 - c. Describe the sampling options associated with liquid and solid sample/evidence collection.
 - d. Describe the field screening protocols for collected samples and evidence.
6. Given an example of a release/attack involving a hazardous material/WMD agent, the operations level responder assigned to evidence preservation and sampling shall be able to perform the following tasks:
 - a. Describe the hazards, safety procedures, decontamination and tactical guidelines for this type of incident.
 - b. Describe the factors to be evaluated in selecting the personal protective equipment, sampling equipment, detection devices, and sample and evidence packaging and transport containers.
 - c. Describe the sampling options associated with the collection of liquid and solid samples and evidence.
 - d. Describe the field screening protocols for collected samples and evidence.
7. Given examples of different types of potential criminal hazardous materials/WMD incidents, the operations level responder shall identify and describe the application, use, and limitations of the various types field screening tools that can be utilized for screening the following:
 - a. Corrosivity
 - b. Flammability
 - c. Oxidation
 - d. Radioactivity
 - e. Volatile organic compounds (VOC)
8. Describe the potential adverse impact of using destructive field screening techniques.
9. Describe the procedures for maintaining the evidentiary integrity of any item removed from the crime scene.

603-6.5.3.2

Selecting Personal Protective Equipment

The operations level responder assigned to evidence preservation and sampling shall select the personal protective equipment required to support evidence preservation and sampling at hazardous materials/WMD incidents based on local procedures (see Section 603-6.2).

603-6.5.4

Competencies — Implementing the Planned Response

603-6.5.4.1

Implementing the Planned Response

Given the incident action plan for a criminal incident involving hazardous materials/WMD, the operations level responder assigned to evidence

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preservation and sampling shall implement or oversee the implementation of the selected response actions safely and effectively and shall meet the following requirements:

1. Secure, characterize, and preserve the scene.
2. Document personnel and scene activities associated with the incident.
3. Describe whether the responders are within their legal authority to perform evidence preservation and sampling tasks.
4. Notify the agency with investigative authority.
5. Notify the EOD personnel.
6. Identify potential samples and evidence to be collected.
7. Demonstrate the procedures to protect samples and evidence from secondary contamination.
8. Demonstrate the correct techniques to collect samples utilizing the equipment provided.
9. Demonstrate the documentation procedures.
10. Demonstrate the sampling protocols.
11. Demonstrate field screening protocols for samples and evidence collected.
12. Demonstrate evidence labeling and packaging procedures.
13. Demonstrate evidence decontamination procedures.
14. Demonstrate evidence packaging procedures for evidence transportation.

603-6.5.4.2 The operations level responder assigned to evidence preservation and sampling shall describe local procedures for the technical decontamination process.

603-6.5.5 ***Competencies — Implementing the Planned Response (Reserved)***

603-6.5.6 ***Competencies — Terminating the Incident (Reserved)***

603-6.6 ***Mission-Specific Competencies: Product Control***

603-6.6.1 ***General***

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603-6.6.1.1 **Introduction**

603-6.6.1.1.1 The operations level responder assigned to perform product control shall be that person, competent at the operations level, who is assigned to implement product control measures at hazardous materials/WMD incidents.

603-6.6.1.1.2 The operations level responder assigned to perform product control at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (Section 601), all core competencies at the operations level (Section 602), all mission-specific competencies for personal protective equipment (Section 603-6.2), and all competencies in this section.

603-6.6.1.1.3 The operations level responder assigned to perform product control at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

603-6.6.1.1.4 The operations level responder assigned to perform product control at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

603-6.6.1.2 **Goal**

603-6.6.1.2.1 The goal of the competencies in this section shall be to provide the operations level responder assigned to product control at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks in 6.6.1.2.2 safely and effectively.

603-6.6.1.2.2 When responding to hazardous materials/WMD incidents, the operations level responder assigned to perform product control shall be able to perform the following tasks:

1. Plan an initial response within the capabilities and competencies of available personnel, personal protective equipment, and control equipment and in accordance with the emergency response plan or standard operating procedures by completing the following tasks:
 - a. Describe the control options available to the operations level responder.
 - b. Describe the control options available for flammable liquid and flammable gas incidents.

2. Implement the planned response to a hazardous materials/WMD incident.

603-6.6.2 **Competencies — Analyzing the Incident (Reserved)**

603-6.6.3 **Competencies — Planning the Response**

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603-6.6.3.1

Identifying Control Options

Given examples of hazardous materials/WMD incidents, the operations level responder assigned to perform product control shall identify the options for each response objective and shall meet the following requirements as prescribed by the AHJ:

1. Identify the options to accomplish a given response objective.
2. Identify the purpose for and the procedures, equipment, and safety precautions associated with each of the following control techniques:
 - a. Absorption
 - b. Adsorption
 - c. Damming
 - d. Diking
 - e. Dilution
 - f. Diversion
 - g. Remote valve shutoff
 - h. Retention
 - i. Vapor dispersion
 - j. Vapor suppression

603-6.6.3.2

Selecting Personal Protective Equipment

The operations level responder assigned to perform product control shall select the personal protective equipment required to support product control at hazardous materials/WMD incidents based on local procedures (see *Section 603-6.2*).

603-6.6.4

Competencies — Implementing the Planned Response

603-6.6.4.1

Performing Control Options

Given an incident action plan for a hazardous materials/WMD incident, within the capabilities and equipment provided by the AHJ, the operations level responder assigned to perform product control shall demonstrate control functions set out in the plan and shall meet the following requirements as prescribed by the AHJ:

1. Using the type of special purpose or hazard suppressing foams or agents and foam equipment furnished by the AHJ, demonstrate the application of the foam(s) or agent(s) on a spill or fire involving hazardous materials/WMD.
2. Identify the characteristics and applicability of the following Class B foams if supplied by the AHJ:
 - a. Aqueous film-forming foam (AFFF)
 - b. Alcohol-resistant concentrates
 - c. Fluoroprotein
 - d. High-expansion foam

3. Given the required tools and equipment, demonstrate how to perform the following control activities:
 - a. Absorption
 - b. Adsorption
 - c. Damming
 - d. Diking
 - e. Dilution
 - f. Diversion
 - g. Retention
 - h. Remote valve shutoff
 - i. Vapor dispersion
 - j. Vapor suppression
4. Identify the location and describe the use of emergency remote shutoff devices on MC/DOT-306/406, MC/DOT-307/407, and MC-331 cargo tanks containing flammable liquids or gases.
5. Describe the use of emergency remote shutoff devices at fixed facilities.

603-6.6.4.2 The operations level responder assigned to perform product control shall describe local procedures for going through the technical decontamination process.

603-6.6.5 **Competencies — Evaluating Progress (Reserved)**

603-6.6.6 **Competencies — Terminating the Incident.(Reserved)**

603-6.7 **Mission-Specific Competencies: Air Monitoring and Sampling**

603-6.7.1 **General**

603-6.7.1.1 **Introduction**

603-6.7.1.1.1 The operations level responder assigned to perform air monitoring and sampling shall be that person, competent at the operations level, who is assigned to implement air monitoring and sampling operations at hazardous materials/WMD incidents.

603-6.7.1.1.2 The operations level responder assigned to perform air monitoring and sampling at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (Section 601), all core competencies at the operations level (Section 602), all mission-specific competencies for personal protective equipment (Section 603-6.2), and all competencies in this section.

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- 603-6.7.1.1.3** The operations level responder assigned to perform air monitoring and sampling at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.
1. Direct guidance: operations level responder working under the control of a hazardous material technician or allied professional who can:
 - a. Continually assess and/or observe their actions
 - b. Provide immediate feedback
 2. Written guidance: standard operating procedures or “rules of engagement” that emphasize:
 - a. Task expected operations level responders
 - b. Task beyond the capability of operations level responders
 - c. Required PPE and other equipment to perform the expected task
 - d. Procedures for ensuring coordination within the ICS

- 603-6.7.1.1.4** The operations level responder assigned to perform air monitoring and sampling at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

1. Monitoring and detection equipment may include:
 - a. Carbon monoxide meter
 - b. Colorimetric tubes
 - c. Combustible gas indicator
 - d. Oxygen meter
 - e. Passive dosimeters
 - f. pH indicators and/or pH meters
 - g. Photoionization and/or flame ionization detectors
 - h. Radiation detection instruments
 - i. Reagents
 - j. Test strips
 - k. WMD detectors (chemical and/or biological)
 - l. Other equipment provided by the AHJ
2. Evidence sampling and collection equipment is addressed in Section 603-6.5
3. Sampling equipment that may be used by operations trained responders may be required by the AHJ may include but is not limited to:
 - a. Any tool designated to remove liquid or solid product from a container for the purpose of environmental sampling and testing
 - b. Any container suitable for the collection of a liquid or solid sample based on the type and quantity

603-6.7.1.2 **Goal**

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603-6.7.1.2.1 The goal of the competencies in this section shall be to provide the operations level responder assigned to air monitoring and sampling at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks in 6.7.1.2.2 safely and effectively.

603-6.7.1.2.2 When responding to hazardous materials/WMD incidents, the operations level responder assigned to perform air monitoring and sampling shall be able to perform the following tasks:

1. Plan the air monitoring and sampling activities within the capabilities and competencies of available personnel, personal protective equipment, and control equipment and in accordance with the emergency response plan or standard operating procedures describe the air monitoring and sampling options available to the operations level responder.
2. Implement the air monitoring and sampling activities as specified in the incident action plan.

603-6.7.2 **Competencies – Analyzing the Incident (Reserved)**

603-6.7.3 **Competencies – Planning the Response**

603-6.7.3.1 Given the air monitoring and sampling equipment provided by the AHJ, the operations level responder assigned to perform air monitoring and sampling shall select the detection or monitoring equipment suitable for detecting or monitoring solid, liquid, or gaseous hazardous materials/WMD.

603-6.7.3.2 Given detection and monitoring device(s) provided by the AHJ, the operations level responder assigned to perform air monitoring and sampling shall describe the operation, capabilities and limitations, local monitoring procedures, field testing, and maintenance procedures associated with each device.

603-6.7.3.3 **Selecting Personal Protective Equipment**

The operations level responder assigned to perform air monitoring and sampling shall identify the local procedures for selecting personal protective equipment to support air monitoring and sampling at hazardous materials/WMD incidents.

603-6.7.3.4 **Selecting Personal Protective Equipment**

The operations level responder assigned to perform air monitoring and sampling shall select the personal protective equipment required to support air monitoring and sampling at hazardous materials/WMD incidents based on local procedures (see Section 603-6.2).

603-6.7.4 **Competencies – Implementing the Planned Response**

603-6.7.4.1 Given a scenario involving hazardous materials/WMD and detection and monitoring devices provided by the AHJ, the operations level responder assigned to perform air monitoring and sampling shall demonstrate the field test and operation of each device and interpret the readings based on local procedures.

1. Personnel must be able to identify:
 - a. Solids
 - b. Liquids
 - c. Gases

2. Hazards need to be identified based on:
 - a. Corrosivity
 - b. Flammability
 - c. Oxygen concentration
 - d. Radioactivity
 - e. Toxicity
 - f. Pathogenicity

3. Monitoring and detection equipment may include:
 - a. Carbon monoxide meter
 - b. Colorimetric tubes
 - c. Combustible gas indicator
 - d. Oxygen meter
 - e. Passive dosimeters
 - f. pH indicators and/or pH meters
 - g. Photoionization and/or flame ionization detectors
 - h. Radiation detection instruments
 - i. Reagents
 - j. Test strips
 - k. WMD detectors (chemical and/or biological)
 - l. Other equipment provided by the AHJ

603-6.7.4.2 The operations level responder assigned to perform air monitoring and sampling shall describe local procedures for decontamination of themselves and their detection and monitoring devices upon completion of the air monitoring mission.

603-6.7.5 **Competencies – Evaluating Progress (Reserved)**

603-6.7.6 **Competencies – Terminating the Incident (Reserved)**

603-6.8 **Mission-Specific Competencies: Victim Rescue and Recovery**

603-6.8.1 **General**

603-6.8.1.1 **Introduction**

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- 603-6.8.1.1.1** The operations level responder assigned to perform victim rescue and recovery shall be that person, competent at the operations level, who is assigned to rescue and recover exposed and contaminated victims at hazardous materials/WMD incidents.
- 603-6.8.1.1.2** The operations level responder assigned to perform victim rescue and recovery at hazardous materials/WMD incidents shall be trained to meet all competencies at the awareness level (Section 601), all core competencies at the operations level (Section 602), all mission-specific competencies for personal protective equipment (Section 603-6.2), and all competencies in this section.
- 603-6.8.1.1.3** The operations level responder assigned to perform victim rescue and recovery at hazardous materials/WMD incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.
1. Direct guidance: operations level responder working under the control of a hazardous materials technician or allied professional who can:
 - a. Continually assess and/or observe their actions
 - b. Provide immediate feedback
 2. Written guidance: standard operating procedures or “rules of engagement” that emphasize:
 - a. Task expected operations level responders
 - b. Task beyond the capability of operations level responders
 - c. Required PPE and other equipment to perform the expected task
 - d. Procedures for ensuring coordination within the ICS
- 603-6.8.1.1.4** The operations level responder assigned to perform victim rescue and recovery at hazardous materials/WMD incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.
- 603-6.8.1.2** **Goal**
- 603-6.8.1.2.1** The goal of the competencies in this section shall be to provide the operations level responder assigned victim rescue and recovery at hazardous materials/WMD incidents with the knowledge and skills to perform the tasks in 6.8.1.2.2 safely and effectively.
- 603-6.8.1.2.2** When responding to hazardous materials/WMD incidents, the operations level responder assigned to perform victim rescue and recovery shall be able to perform the following tasks:
1. Plan a response for victim rescue and recovery operations involving the release of hazardous materials/WMD agent within the capabilities of available personnel and personal protective equipment.

2. Implement the planned response to accomplish victim rescue and recovery operations within the capabilities of available personnel and personal protective equipment.

603-6.8.2

Competencies – Analyzing the Incident (Reserved)

603-6.8.3

Competencies – Planning the Response

603-6.8.3.1

Given scenarios involving hazardous materials/WMD incidents, the operations level responder assigned to victim rescue and recovery shall determine the feasibility of conducting victim rescue and recovery operations at an incident involving a hazardous material/WMD and shall be able to perform the following tasks:

1. Determine the feasibility of conducting rescue and recovery operations.
2. Describe the safety procedures, tactical guidelines, and incident response considerations to effect a rescue associated with each of the following situations:
 - a. Line-of-sight with ambulatory victims
 - b. Line-of-sight with nonambulatory victims
 - c. Non-line-of-sight with ambulatory victims
 - d. Non-line-of-sight with nonambulatory victims
 - e. Victim rescue operations versus victim recovery operations
 - i. Additional victim rescue hazard considerations include:
 - a) Hostile human threats
 - b) Improvised explosive devices (IEDs)
 - c) Agent type and possible harm
 - ii. Operational considerations may include:
 - a) The emergency responders will enter potentially contaminated areas only to perform rescue of known live victims or to perform rescue of known live victims or to perform an immediate reconnaissance to determine if live victims exist
 - b) Emergency responders will immediately exit any area where they encounter evidence of chemical contamination and cannot identify any living victims
 - c) Emergency responders will avoid contact with any unidentified materials
 - d) Emergency responders and rescued victims will undergo an emergency decontamination immediately upon exit from the potentially hazardous area
 - e) Immediate medical assistance such as that provided by EMS providers is immediately available

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- f) Emergency responders, when finding conditions in excess of immediately dangerous to life or health (IDLH) should attempt to change the environment (ventilation, vapor dispersion/suppression, etc.) to enable others to respond to assist
 - g) While reducing the hazards to create a safer environment in which to operate is always a good work practice, it is essential when performing victim recovery
3. Determine if the options are within the capabilities of available personnel and personal protective equipment.
 4. Describe the procedures for implementing victim rescue and recovery operations within the incident command system.

603-6.8.3.2

Selecting Personal Protective Equipment

The operations level responder assigned to perform victim rescue and recovery shall select the personal protective equipment required to support victim rescue and recovery at hazardous materials/WMD incidents based on local procedures (see Section 603-6.2).

603-6.8.4

Competencies – Implementing the Planned Response

603-6.8.4.1

Given a scenario involving a hazardous material/WMD, the operations level responder assigned to victim rescue and recovery shall perform the following tasks:

1. Identify the different team positions and describe their main functions.
2. Select and use specialized rescue equipment and procedures provided by the AHJ to support victim rescue and recovery operations.
3. Demonstrate safe and effective methods for victim rescue and recovery.
4. Demonstrate the ability to triage victims.
5. Describe local procedures for performing decontamination upon completion of the victim rescue and removal mission.

603-6.8.5

Competencies – Evaluating Progress (Reserved)

603-6.8.6

Competencies – Terminating the Incident (Reserved)

603-6.9

Mission-Specific Competencies: Response to Illicit Laboratory Incidents

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603-6.9.1 **General**

603-6.9.1.1 **Introduction**

603-6.9.1.1.1 The operations level responder assigned to respond to illicit laboratory incidents shall be that person, competent at the operations level, who, at hazardous materials/WMD incidents involving potential violations of criminal statutes specific to the illegal manufacture of methamphetamines, other drugs, or WMD, is assigned to secure the scene, identify the laboratory or process, and preserve evidence at hazardous materials/WMD incidents involving potential violations of criminal statutes specific to the illegal manufacture of methamphetamines, other drugs, or WMD.

603-6.9.1.1.2 The operations level responder who responds to illicit laboratory incidents shall be trained to meet all competencies at the awareness level (Section 601), all core competencies at the operations level (Section 602), all mission-specific competencies for personal protective equipment (Section 603-6.2), and all competencies in this section.

603-6.9.1.1.3 The operations level responder who responds to illicit laboratory incidents shall operate under the guidance of a hazardous materials technician, an allied professional, or standard operating procedures.

1. Direct guidance: operations level responder working under the control of a hazardous material technician or allied professional who can:
 - a. Continually assess and/or observe their actions
 - b. Provide immediate feedback
2. Written guidance: standard operating procedures or “rules of engagement” that emphasize:
 - a. Task expected operations level responders
 - b. Task beyond the capability of operations level responders
 - c. Required PPE and other equipment to perform the expected task
 - d. Procedures for ensuring coordination within the ICS

603-6.9.1.1.4 The operations level responder who responds to illicit laboratory incidents shall receive the additional training necessary to meet specific needs of the jurisdiction.

603-6.9.1.2 **Goal**

603-6.9.1.2.1 The goal of the competencies in this section shall be to provide the operations level responder assigned to respond to illicit laboratory incidents with the knowledge and skills to perform the tasks in 6.9.1.2.2 safely and effectively.

603-6.9.1.2.2 When responding to hazardous materials/WMD incidents, the operations level responder assigned to respond to illicit laboratory incidents shall be able to perform the following tasks:

1. Analyze a hazardous materials/WMD incident to determine the complexity of the problem and potential outcomes and whether the incident is potentially a criminal illicit laboratory operation.
2. Plan a response for a hazardous materials/WMD incident involving potential illicit laboratory operations in compliance with evidence preservation operations within the capabilities and competencies of available personnel, personal protective equipment, and control equipment after notifying the responsible law enforcement agencies of the problem.
3. Implement the planned response to a hazardous materials/WMD incident involving potential illicit laboratory operations utilizing applicable evidence preservation guidelines.

603-6.9.2 **Competencies – Analyzing the Incident**

603-6.9.2.1 **Determining if a Hazardous Materials/WMD Incident is an Illicit Laboratory Operation**

Given examples of hazardous materials/WMD incidents involving illicit laboratory operations, the operations level responder assigned to respond to illicit laboratory incidents shall identify the potential drugs/WMD being manufactured and shall meet the following related requirements:

1. Illicit laboratories can be designed to produce many different products including:
 - a. Illegal drugs (e.g., methamphetamines)
 - b. Chemical modification (e.g., distilled pesticides)
 - c. Biological toxins or pathogens (e.g., ricin, anthrax, toularemia)
 - d. Explosives (e.g., ANFO, pipe bombs)
2. Given examples of illicit drug manufacturing methods, describe the operational considerations, hazards, and products involved in the illicit process.
3. Given examples of illicit chemical WMD methods, describe the operational considerations, hazards, and products involved in the illicit process.
4. Given examples of illicit biological WMD methods, describe the operational considerations, hazards, and products involved in the illicit process.
5. Given examples of illicit laboratory operations, describe the potential booby traps that have been encountered by response personnel.

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6. Given examples of illicit laboratory operations, describe the agencies that have investigative authority and operational responsibility to support the response.

603-6.9.3 **Competencies – Planning the Response**

603-6.9.3.1 **Determining the Response Options**

Given an analysis of hazardous materials/WMD incidents involving illicit laboratories, the operations level responder assigned to respond to illicit laboratory incidents shall identify possible response options.

603-6.9.3.2 **Identifying Unique Aspects of Criminal Hazardous Materials/WMD Incidents**

603-6.9.3.2.1 The operations level responder assigned to respond to illicit laboratory incidents shall identify the unique operational aspects associated with illicit drug manufacturing and illicit WMD manufacturing.

603-6.9.3.2.2 Given an incident involving illicit drug manufacturing or illicit WMD manufacturing, the operations level responder assigned to illicit laboratory incidents shall describe the following tasks:

1. Law enforcement securing and preserving the scene
 - a. Tasks include neutralization of tactical threat
 - b. Safe rendering of explosive devices or booby traps
 - c. Maintain accountability and identification of all personnel in the crime scene
 - d. Crime scene documentation
 - e. Safeguarding/protecting evidence
2. Joint hazardous materials and EOD personnel site reconnaissance and hazard identification
3. Determining atmospheric hazards through air monitoring and detection
 - a. At a minimum, monitoring should include:
 - i. Flammability – combustible gas indicator
 - ii. Oxygen level – oxygen meter
 - iii. Toxicity – photoionization detector
 - iv. Corrosivity – pH paper
 - v. Radiological – radiological survey meter
 - b. Other monitoring devices as determined by the AHJ
4. Mitigation of immediate hazards while preserving evidence
5. Coordinated crime scene operation with the law enforcement agency having investigative authority

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6. Documenting personnel and scene activities associated with incident

603-6.9.3.3

Identifying the Law Enforcement Agency That Has Investigative Jurisdiction

The operations level responder assigned to respond to illicit laboratory incidents shall identify the law enforcement agency having investigative jurisdiction and shall meet the following requirements:

1. Given scenarios involving illicit drug manufacturing or illicit WMD manufacturing, identify the law enforcement agency(s) with investigative authority for the following situations:
 - a. Illicit drug manufacturing
 - b. Illicit WMD manufacturing
 - c. Environmental crimes resulting from illicit laboratory operations
2. Identify the role of law enforcement agencies at the following levels:
 - a. Federal
 - b. State
 - c. Local

603-6.9.3.4

Identifying Unique Tasks and Operations at Sites Involving Illicit Laboratories

603-6.9.3.4.1

The operations level responder assigned to respond to illicit laboratory incidents shall identify and describe the unique tasks and operations encountered at illicit laboratory scenes.

603-6.9.3.4.2

Given scenarios involving illicit drug manufacturing or illicit WMD manufacturing, describe the following:

1. Hazards, safety procedures, and tactical guidelines for this type of emergency
2. Factors to be evaluated in selection of the appropriate personal protective equipment for each type of tactical operation
 - a. Selection of PPE is based upon:
 - i. Available intelligence
 - ii. Outward warning signs
 - iii. Detection clues
 - iv. Activity of animals
 - v. Interviews with neighbors/witnesses
 - b. Explosive ordnance disposal (EOD) operations will require an appropriate level of EOD protective gear to augment chemical protective clothing based on the hazard risk assessment
3. Factors to be considered in selection of appropriate decontamination procedures
4. Factors to be evaluated in the selection of detection devices

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5. Factors to be considered in the development of a remediation plan

603-6.9.3.5

Selecting Personal Protective Equipment

The operations level responder assigned to respond to illicit laboratory incidents shall select the personal protective equipment required to respond to illicit laboratory incidents based on local procedures.

603-6.9.4

Competencies – Implementing the Planned Response

603-6.9.4.1

Implementing the Planned Response

Given scenarios involving an illicit drug/WMD laboratory operation involving hazardous materials/WMD, the operations level responder assigned to respond to illicit laboratory incidents shall implement or oversee the implementation of the selected response options safely and effectively.

603-6.9.4.1.1

Given a simulated illicit drug/WMD laboratory incident, the operations level responder assigned to respond to illicit laboratory incidents shall be able to perform the following tasks:

1. Describe safe and effective methods for law enforcement to secure the scene.
2. Demonstrate decontamination procedures for tactical law enforcement personnel (SWAT or K-9) securing an illicit laboratory.
3. Demonstrate methods to identify and avoid potential unique safety hazards found at illicit laboratories such as booby traps and releases of hazardous materials.
4. Demonstrate methods to conduct joint hazardous materials/EOD operations to identify safety hazards and implement control procedures.
 - a. At a minimum, monitoring should include:
 - i. Flammability – combustible gas indicator
 - ii. Oxygen level – oxygen meter
 - iii. Toxicity – photoionization detector
 - iv. Corrosivity – pH paper
 - v. Radiological – radiological survey meter
 - b. Other monitoring devices as determined by the AHJ

603-6.9.4.1.2

Given a simulated illicit drug/WMD laboratory entry operation, the operations level responder assigned to respond to illicit laboratory incidents shall demonstrate methods of identifying the following during reconnaissance operations:

1. The potential manufacture of illicit drugs
2. The potential manufacture of illicit WMD materials

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3. Potential environmental crimes associated with the manufacture of illicit drugs/WMD materials

603-6.9.4.1.3 Given a simulated illicit drug/WMD laboratory incident, the operations level responder assigned to respond to illicit laboratory incidents shall describe joint agency crime scene operations, including support to forensic crime scene processing teams.

603-6.9.4.1.4 Given a simulated illicit drug/WMD laboratory incident, the operations level responder assigned to respond to illicit laboratory incidents shall describe the policy and procedures for post-crime scene processing and site remediation operations.

603-6.9.4.1.5 The operations level responder assigned to respond to illicit laboratory incidents shall be able to describe local procedures for performing decontamination upon completion of the illicit laboratory mission.

603-6.9.5 **Competencies – Evaluating Progress (Reserved)**

603-6.9.6 **Competencies – Terminating the Incident (Reserved)**

4. Discussion and possible recommendation regarding proposed changes to 37 TAC, Chapter 429, Minimum Standards for Fire Inspectors, Subchapter B, including, but not limited to §429.203, Minimum Standards for Basic Fire Inspector Certification—New Track.

Chapter 429

MINIMUM STANDARDS FOR FIRE INSPECTORS

SUBCHAPTER A

MINIMUM STANDARDS FOR FIRE INSPECTOR CERTIFICATION BASED ON REQUIREMENTS IN EFFECT PRIOR TO JANUARY 1, 2005

§429.1. Minimum Standards for Fire Inspection Personnel.

- (a) Subchapter A of this chapter will expire on December 31, 2010.
- (b) Fire protection personnel of a governmental entity who are appointed to fire code enforcement duties must be certified, as a minimum, as a basic fire inspector as specified in §429.3 of this title (relating to Minimum Standards for Basic Fire Inspector Certification) within one year of initial appointment to such position.
- (c) Prior to being appointed to fire code enforcement duties, all personnel must complete a Commission-approved basic fire inspection training program and successfully pass the Commission examination pertaining to that curriculum.
- (d) Individuals holding any level of fire inspector certification shall be required to comply with the continuing education requirements of §441.13 of this title (relating to Continuing Education for Fire Inspection Personnel).
- (e) Code enforcement is defined as the enforcement of laws, codes, and ordinances of the authority having jurisdiction pertaining to fire prevention.

Source: The provisions of this §429.1 adopted to be effective November 1, 1998, amended to be effective December 24, 2002; amended to be effective August 5, 2004; 32 TexReg 8529, amended to be effective November 28, 2007.

§429.3. Minimum Standards for Basic Fire Inspector Certification.

In order to be certified by the Commission as a Basic Fire Inspector an individual must have completed a Commission-approved Basic Fire Inspector Curriculum dated prior to January 1, 2005, and successfully pass the Commission examination as specified in Chapter 439 of this title (relating to Examinations for Certification).

Source: The provisions of this §429.3 adopted to be effective November 1, 1998, amended to be effective May 23, 1999, amended to be effective November 5, 2000, amended to be effective December 24, 2002; amended to be effective August 5, 2004; amended to be effective May 26, 2005; amended to be effective November 8, 2005; amended to be effective March 27, 2006, 33 TexReg 660, amended to be effective August 17, 2008.

§429.5. Minimum Standards for Intermediate Fire Inspector Certification.

- (a) Applicants for Intermediate Fire Inspector Certification holding the prerequisite Basic Fire Inspector certification based on the curricula in place before January 1, 2005, must meet the following requirements:
 - (1) acquire a minimum of four years of fire protection experience and complete the training listed in one of the following options:

- (A) Option 1--Successfully complete six semester hours of fire science or fire technology from an approved Fire Protection Degree Program and submit documentation as required by the commission that the courses comply with subsections (b) and (c) of this section; or
 - (B) Option 2— Completion of coursework from either the A-List or the B-List courses. Acceptable combinations of courses are as follows: two A-List courses; or eight B-List courses; or one A-List course and four B-List courses. (See the exception outlined in subsection (c) of this section); or
 - (C) Option 3— Completion of coursework from either the A-List or the B-List courses in combination with college courses in fire science or fire protection. Acceptable combinations of courses are three semester hours meeting the requirements of Option 1 with either one A-List course or four B-List courses (See the exception outlined in subsection (c) of this section).
- (b) Non-traditional credit awarded at the college level, such as credit for experience or credit by examination obtained from attending any school in the commission's Certification Curriculum Manual or for experience in the fire service, may not be counted toward this level of certification.
 - (c) The training required in this section must be in addition to any training used to qualify for any lower level of Fire Inspector Certification. Repeating a course or a course of similar content cannot be used towards this level of certification.

Source: The provisions of this §429.5 adopted to be effective November 1, 1998, amended to be effective June 9, 2002, amended to be effective December 24, 2002; amended to be effective August 5, 2004.

§429.7. Minimum Standards for Advanced Fire Inspector Certification.

- (a) Applicants for Advanced Fire Inspector certification holding the prerequisite Basic Fire Inspector certification based on the curricula in place before January 1, 2005 must complete the following requirements:
 - (1) hold as a prerequisite an Intermediate Fire Inspector Certification as defined in §429.5 of this title (relating to Minimum Standards for Intermediate Fire Inspector Certification); and
 - (2) acquire a minimum of eight years of fire protection experience and complete the training listed in one of the following options:
 - (A) Option 1--Successfully complete six semester hours of fire science or fire technology from an approved Fire Protection Degree Program and submit documentation as required by the commission that the courses comply with subsections (b) and (c) of this section; or
 - (B) Option 2—Completion of coursework from either the A-List or the B-List courses. Acceptable combinations of courses are as follows: two A-List courses; or eight B-List courses; or one A-List course and four B-List courses. (See the exception outlined in subsection (c) of this section); or
 - (C) Option 3—Completion of coursework from either the A-List or the B-List courses in combination with college courses in fire science or fire protection. Acceptable combinations of courses are three semester hours meeting the requirements of Option 1 with either one A-List course or four B-List courses (See the exception outlined in subsection (c) of this section).
- (b) Non-traditional credit awarded at the college level, such as credit for experience or credit by examination obtained from attending any school in the commission's Certification Curriculum

Manual or for experience in the fire service, may not be counted toward this level of certification.

- (c) The training required in this section must be in addition to any training used to qualify for any lower level of Fire Inspector Certification. Repeating a course or a course of similar content cannot be used towards this level of certification.

Source: The provisions of this §429.7 adopted to be effective November 1, 1998, amended to be effective June 9, 200, amended to be effective December 24, 2002; amended to be effective August 5, 2004.

§429.9. Minimum Standards for Master Fire Inspector Certification.

- (a) Applicants for Master Fire Inspector Certification must complete the following requirements:
 - (1) hold as a prerequisite an Advanced Fire Inspector Certification as defined in §429.7(a) of this title (relating to Minimum Standards for Advanced Fire Inspector Certification); and
 - (2) acquire a minimum of 12 years of fire protection experience, and 60 college semester hours or an associate degree, which includes at least 18 college semester hours in fire science subjects.
- (b) College level courses from both the upper and lower division may be used to satisfy the education requirement for Master Fire Inspector Certification.

Source: The provisions of this §429.9 adopted to be effective November 1, 1998; amended to be effective August 5, 2004.

§429.11. International Fire Service Accreditation Congress (IFSAC) Seal.

- (a) Individuals who hold commission Fire Inspector certification prior to January 1, 2005, may be granted International Fire Service Accreditation Congress (IFSAC) seals for Inspector I and Inspector II by making application to the commission for the IFSAC seals and paying applicable fees.
- (b) Individuals who hold commission Fire Inspector certification prior to January 1, 2005, may apply to test for Plan Examiner I. Upon successful completion of the examination an IFSAC seal for Plan Examiner I may be granted by making application to the commission for the IFSAC seal and paying the applicable fee.
- (c) Individuals who pass the applicable state examination based on the curriculum in place prior to January 1, 2005, may be granted IFSAC seals for Inspector I and Inspector II by making application to the commission for the IFSAC seals and paying applicable fees.
- (d) Individuals who pass the applicable state examination based on the curriculum in place prior to January 1, 2005, may apply to test for Plans Examiner I. Upon successful completion of the examination an IFSAC seal for Plans Examiner I may be granted by making application to the commission for the IFSAC seal and paying the applicable fee.
- (e) Individuals who pass the applicable commission examination(s) as specified in Chapter 439 of this title (relating to Examinations for Certification) pertaining to Chapter 4 of the commission's Certification Curriculum Manual, as approved by the commission in accordance with Chapter 443 of this title (relating to Certification Curriculum Manual), on or after January 1, 2005, must follow the guidelines of Subchapter B of this chapter.

Source: The provisions of this §429.11 adopted to be effective August 5, 2004; amended to be effective March 27, 2006.

SUBCHAPTER B

Minimum Standards for Fire Inspector Certification

§429.201. Minimum Standards for Fire Inspector Personnel – New Track.

- (a) Fire protection personnel of a governmental entity who are appointed to fire code enforcement duties must be certified, as a minimum, as a basic fire inspector as specified in §429.203 of this title (relating to Minimum Standards for Basic Fire Inspector Certification-- New Track) within one year of initial appointment to such position.
- (b) Prior to being appointed to fire code enforcement duties, all personnel must complete a Commission-approved basic fire inspection training program and successfully pass the Commission examination pertaining to that curriculum.
- (c) Individuals holding any level of fire inspector certification shall be required to comply with the continuing education requirements in §441.13 of this title (relating to Continuing Education for Fire Inspection Personnel).
- (d) Code enforcement is defined as the enforcement of laws, codes, and ordinances of the authority having jurisdiction pertaining to fire prevention.

Source: The provisions of this §429.201 adopted to be effective August 5, 2004; 32 TexReg 8529 amended to be effective November 28, 2007.

§429.203. Minimum Standards for Basic Fire Inspector Certification – New Track.

In order to be certified as a basic fire inspector, an individual must:

- (1) possess valid documentation of accreditation from the International Fire Service Accreditation Congress as an Inspector I, Inspector II, and Plans Examiner I; or
- (2) complete a Commission-approved Basic Fire Inspector program and successfully pass the Commission examination(s) as specified in Chapter 439 of this title (relating to Examinations for Certification). An approved basic fire inspection training program shall consist of one or any combination of the following:
 - (A) completion of the Commission-approved Basic Fire Inspector Curriculum, as specified in Chapter 4 of the Commission's Certification Curriculum Manual; or
 - (B) successful completion of an out-of-state and/or military training program which has been submitted to the Commission for evaluation and found to meet the minimum requirements as listed in the Commission-approved Basic Fire Inspector Curriculum as specified in Chapter 4 of the Commission's Certification Curriculum Manual; or
 - (C) successful completion of the following college courses:
 - (i) Fire Protection Systems, three semester hours;
 - (ii) Fire Prevention, three semester hours; or Fire Prevention Codes and Inspections, three semester hours;

- (iii) Building Code, three semester hours;
- (iv) Building Construction, three semester hours;
- (v) Hazardous Materials, three semester hours. (Total semester hours, 15*. NOTE: Building Code and Building Construction may be combined into a single three-semester hour class. If this is the case, the total semester hours may be reduced to 12. Hazardous Materials I or II may be used to satisfy the requirements of Hazardous Materials) ~~;~~ ~~or~~

~~(D) — successful completion of a National Fire Academy program for fire inspection. The program must include the basic course, Fire Inspection Principles I, and two of the following courses or their successors:~~

- ~~(i) — Fire Prevention Specialist II; or~~
- ~~(ii) — Plans Review for Inspectors; or~~
- ~~(iii) — Code Management: A Systems Approach; or~~
- ~~(iv) — Management of Fire Prevention Programs; or~~
- ~~(v) — Strategic Analysis of Fire Prevention Programs.~~

Source Note: *The provisions of this §429.203 adopted to be effective August 5, 2004, 29 TexReg 7453; amended to be effective May 26, 2005, 30 TexReg 3034; amended to be effective November 8, 2005, 30 TexReg 7237; amended to be effective November 28, 2007, 32 TexReg 8529; amended to be effective August 17, 2008, 33 TexReg 6603; amended to be effective November 18, 2009, 34 TexReg 8041*

§429.205. Minimum Standards for Intermediate Fire Inspector Certification – New Track.

Applicants for Intermediate Fire Inspector certification holding a prerequisite Basic Fire Inspector certification as defined in §429.203 of this title (relating to Minimum Standards for Basic Fire Inspector Certification – New Track) must have acquired four (4) years experience appointed as a fire inspector.

Source: *The provisions of this §429.205 adopted to be effective August 5, 2004.*

§429.207. Minimum Standards for Advanced Fire Inspector Certification--New Track.

Applicants for Advanced Fire Inspector Certification must complete the following requirements:

- (1) hold as a prerequisite an Intermediate Fire Inspector certification as defined in §429.205 of this title (relating to Minimum Standards for Intermediate Fire Inspector Certification--New Track);
- (2) acquire as a minimum eight (8) years experience appointed as a fire inspector; and
- (3) show successful completion of Fire Inspector III and Plans Examiner II courses meeting the applicable job performance requirements as identified in NFPA 1031, Professional Qualifications for Fire Inspector and Plan Examiner.

Source Note: *The provisions of this §429.207 adopted to be effective August 5, 2004, 29 TexReg 7453; 32 TexReg 2480, amended to be effective May 9, 2007.*

§429.209. Minimum Standards for Master Fire Inspector Certification – New Track.

- (a) Applicants for Master Fire Inspector Certification must complete the following requirements:
- (1) hold as a prerequisite an Advanced Fire Inspector certification as defined in §429.207 of this title (relating to Minimum Standards for Advanced Fire Inspector Certification – New Track); and
 - (2) acquire a minimum of 12 years experience appointed as a fire inspector, and 60 college semester hours or an associate degree, which includes at least 18 college semester hours in fire science subjects.
- (b) College level courses from both the upper and lower division may be used to satisfy the education requirement for Master Fire Inspector Certification.

Source: *The provisions of this §429.209 adopted to be effective August 5, 2004.*

§429.211. International Fire Service Accreditation Congress (IFSAC) Seal – New Track.

- (a) Individuals who hold commission Fire Inspector certification prior to January 1, 2005, may be granted International Fire Service Accreditation Congress (IFSAC) seals for Inspector I and Inspector II by making application to the commission for the IFSAC seals and paying applicable fees.
- (b) Individuals who hold commission Fire Inspector certification prior to January 1, 2005, may apply to test for Plan Examiner I. Upon successful completion of the examination an IFSAC seal for Plan Examiner I may be granted by making application to the commission for the IFSAC seal and paying the applicable fee.
- (c) Individuals who pass the applicable state examination prior to January 1, 2005, may be granted IFSAC seals for Inspector I and Inspector II by making application to the commission for the IFSAC seals and paying applicable fees.
- (d) Individuals who pass the applicable state examination prior to January 1, 2005, may apply to test for Plan Examiner I. Upon successful completion of the examination an IFSAC seal for Plan Examiner I may be granted by making application to the commission for the IFSAC seal and paying the applicable fee.
- (e) Individuals who pass the applicable section of the state examination on or after January 1, 2005, may be granted IFSAC seal(s) for Inspector I, Inspector II, and/or Plan Examiner I by making application to the commission for the IFSAC seal(s) and paying the applicable fees, provided they meet the following provisions:
- (1) To receive the IFSAC Inspector I seal, the individual must:
 - (A) complete the Inspector I section of a commission-approved course; and
 - (B) pass the Inspector I section of a commission examination.
 - (2) To receive the IFSAC Inspector II seal, the individual must:

- (A) complete the Inspector II section of a commission-approved course;
 - (B) document possession of an IFSAC Inspector I seal; and
 - (C) pass the Inspector II section of a commission examination.
- (3) To receive the IFSAC Plan Examiner I seal, the individual must:
- (A) complete the Plan Examiner I section of a commission-approved course; and
 - (B) pass the Plan Examiner I section of a commission examination.

Source: *The provisions of this §429.211 adopted to be effective August 5, 2004; amended to be effective March 2, 2005; amended to be effective March 27, 2006.*

5. Discussion and possible recommendation regarding proposed changes to 37 TAC, Chapter 431, Fire Investigation, Subchapter A, including, but not limited to new §431.3 Minimum Standards for Basic Arson Investigator Certification.

CHAPTER 431

FIRE INVESTIGATION

Subchapter A

MINIMUM STANDARDS FOR ARSON INVESTIGATOR CERTIFICATION

§431.1. Minimum Standards for Arson Investigation Personnel.

- (a) Fire protection personnel who are assigned arson investigation duties must be certified, as a minimum, as a basic arson investigator as specified in §431.3 of this title (relating to Minimum Standards for Basic Arson Investigator Certification) within one year from the date of initial appointment to such position.
- (b) Prior to being appointed to arson investigation duties, fire protection personnel must complete a commission approved basic fire investigator training program and successfully pass the commission examination pertaining to that curriculum.
- (c) Personnel holding any level of arson investigation certification shall be required to comply with the continuing education requirements in §441.15 of this title (relating to Continuing Education Requirements for Arson Investigator or Fire Investigator).

Source: The provisions of this §431.1 adopted to be effective November 1, 1998, amended to be effective December 24, 2002.

§431.3. Minimum Standards for Basic Arson Investigator Certification.

In order to be certified by the Commission as a Basic Arson Investigator an individual must:

- (1) possess a current basic peace officer's license from the Texas Commission on Law Enforcement Officer Standards and Education or documentation that the individual is a federal law enforcement officer;
- (2) hold a current Commission as a peace officer with the employing entity for which the arson investigations will be done; and
- (3) possess valid documentation of accreditation from the International Fire Service Accreditation Congress as a Fire Investigator; or
- (4) complete a Commission-approved basic fire investigation training program and successfully pass the Commission examination as specified in Chapter 439 of this title (relating to Examinations for Certification). An approved fire investigation training program shall consist of one of the following:
 - (A) completion of the Commission-approved Fire Investigator Curriculum, as specified in Chapter 5 of the Commission's Certification Curriculum Manual;

- ~~(B)~~ successful completion of a National Fire Academy program for fire investigation. The program must include the basic course, Fire Arson Investigation, and two of the following courses or their predecessor:
 - ~~(i)~~ Arson Detection; or
 - ~~(ii)~~ Fire Cause Determination for Company Officers; or
 - ~~(iii)~~ Initial Fire Investigation; or
 - ~~iv)~~ Management of Arson Prevention and Control.
- ~~(B)(E)~~ successful completion of an out-of-state or military training program which has been submitted to the Commission for evaluation and found to meet the minimum requirements as listed in the Commission-approved Fire Investigator Curriculum as specified in Chapter 5 of the Commission's Certification Curriculum Manual; or
- ~~(C)(D)~~ successful completion of the following college courses: Arson Investigator, 3 semester hours; Hazardous Materials, 3 semester hours; Building Construction, 3 semester hours; Fire Protection Systems, 3 semester hours. Total semester hours, 12. The three semester hour course "Building Codes and Construction" may be substituted for Building Construction. Arson Investigator I or II may be used to satisfy the requirements of Arson Investigation. Hazardous Materials I or II may be used to satisfy the requirements of Hazardous Materials.

Source: The provisions of this §431.3 adopted to be effective November 1, 1998; amended to be effective March 2, 2000; amended to be effective October 11, 2000; amended to be effective March 8, 2001; amended to be effective July 29, 2002, amended to be effective December 24, 2002; amended to be effective September 2, 2003; amended to be effective May 26, 2005; 33 TexReg 1132; amended to be effective February 17, 2008; 33 TexReg 6603, amended to be effective August 17, 2008.

§431.5. Minimum Standards for Intermediate Arson Investigator Certification.

- (a) Applicants for Intermediate Arson Investigator Certification must complete the following requirements:
 - (1) hold as a prerequisite a Basic Arson Investigator Certification as defined in §431.3 of this title (relating to Minimum Standards for Basic Arson Investigator Certification); and
 - (2) acquire a minimum of four years of fire protection experience and complete the requirements listed in one of the following options:
 - (A) Option 1--Successfully complete six semester hours of fire science or fire technology from an approved Fire Protection Degree Program and submit documentation as required by the commission that the courses comply with subsections (b) and (c) of this section; or
 - (B) Option 2—Completion of coursework from either the A-List or the B-List courses. Acceptable combinations of courses are as follows: two A-List courses; or eight B-List courses; or one A-List course and four B-List courses. (See the exception outlined in subsection (c) of this section); or

- (C) Option 3—Completion of coursework from either the A-List or the B-List courses in combination with college courses in fire science or fire protection. Acceptable combinations of courses are three semester hours meeting the requirements of Option 1 with either one A-List course or four B-List courses (See the exception outlined in subsection (c) of this section); or
 - (D) Option 4—Hold current Intermediate Peace Officer certification from the Texas Commission on Law Enforcement Officer Standards and Education (TCLEOSE) with four additional law enforcement courses applicable for fire investigations. (See exception outlined in subsection (c) of this section.)
- (b) Non-traditional credit awarded at the college level, such as credit for experience or credit by examination obtained from attending any school in the commission's Certification Curriculum Manual or for experience in the fire service, may not be counted toward this level of certification.
- (c) The training required in this section must be in addition to any training used to qualify for any lower level of Arson Investigator Certification. Repeating a course or a course of similar content cannot be used towards this level of certification.

Source: The provisions of this §431.5 adopted to be effective November 1, 1998, amended to be effective July 29, 2002, amended to be effective December 24, 2002; amended to be effective November 15, 2003; amended to be effective August 5, 2004; amended to be effective May 26, 2005.

§431.7. Minimum Standards for Advanced Arson Investigator Certification.

- (a) Applicants for Advanced Arson Investigator certification must complete the following requirements:
- (1) hold as a prerequisite an Intermediate Arson Investigator Certification as defined in §431.5 of this title (relating to Minimum Standards for Intermediate Arson Investigator Certification); and
 - (2) acquire a minimum of eight years of fire protection experience and complete the requirements listed in one of the following options:
 - (A) Option 1--Successfully complete six semester hours of fire science or fire technology from an approved Fire Protection Degree Program and submit documentation as required by the commission that the courses comply with subsections (b) and (c) of this section; or
 - (B) Option 2—Completion of coursework from either the A-List or the B-List courses. Acceptable combinations of courses are as follows: two A-List courses; or eight B-List courses; or one A-List course and four B-List courses. (See the exception outlined in subsection (c) of this section); or
 - (C) Option 3—Completion of coursework from either the A-List or the B-List courses in combination with college courses in fire science or fire protection. Acceptable combinations of courses are three semester hours meeting the requirements of Option 1 with either one A-List course or four B-List courses (See the exception outlined in subsection (c) of this section); or

- (D) Option 4--Advanced Arson for Profit or Complex Arson Investigative Techniques (Bureau of Alcohol, Tobacco, Firearms, and Explosives resident or field course, 80 hours); or
 - (E) Option 5—Hold current Advanced Peace Officer certification from the Texas Commission on Law Enforcement Officer Standards & Education (TCLEOSE) with four additional law enforcement courses applicable for fire investigations. (See exception outlined in subsection (c) of this section.)
- (b) Non-traditional credit awarded at the college level, such as credit for experience or credit by examination obtained from attending any school in the commission's Certification Curriculum Manual or for experience in the fire service, may not be counted toward this level of certification.
- (c) The training required in this section must be in addition to any training used to qualify for any lower level of Arson Investigator Certification. Repeating a course or a course of similar content cannot be used towards this level of certification.

Source: The provisions of this §431.7 adopted to be effective November 1, 1998, amended to be effective July 29, 2002, amended to be effective December 24, 2002; amended to be effective November 15, 2003; amended to be effective August 5, 2004; amended to be effective May 26, 2005.

§431.9. Minimum Standards for Master Arson Investigator Certification.

- (a) Applicants for Master Arson Investigator Certification must complete the following requirements:
- (1) hold as a prerequisite an Advanced Arson Investigator Certification as defined in §431.7 of this title (relating to Minimum Standards for Advanced Arson Investigator Certification); and
 - (2) acquire a minimum of twelve years of fire protection experience, and 60 college semester hours or an associate degree, which includes at least 18 college semester hours in fire science subjects.
- (b) College level courses from both the upper and lower division may be used to satisfy the education requirement for Master Arson Investigator Certification.

Source: The provisions of this §431.9 adopted to be effective November 1, 1998.

§431.11. Minimum Standards for Arson Investigator Certification for Law Enforcement Personnel.

- (a) A law enforcement officer employed or commissioned by a law enforcement agency as a peace officer who is designated as an arson investigator by an appropriate local authority is eligible for certification on a voluntary basis by complying with this chapter.
- (b) An individual holding commission certification as a fire investigator who becomes a law enforcement officer employed or commissioned by a law enforcement agency as a peace officer, and who is designated as an arson investigator by an appropriate local authority will qualify for a similar level arson investigator certificate. To obtain a printed certificate the individual must make application to the commission to include confirmation of commission.

Source: The provisions of this §431.11 adopted to be effective November 1, 1998, amended to be effective May 23, 1999; amended to be effective May 21, 2006.

§431.13. International Fire Service Accreditation Congress (IFSAC) Seal.

- (a) Individuals holding a current commission Arson Investigator certification may be granted an International Fire Service Accreditation Congress (IFSAC) seal as a Fire Investigator by making application to the commission for the IFSAC seal and paying applicable fees.
- (b) Individuals completing a commission-approved basic fire investigator program and passing the applicable state examination may be granted an IFSAC seal as a Fire Investigator by making application to the commission for the IFSAC seal and paying applicable fees.

Source: The provisions of this §431.13 adopted to be effective July 29, 2002; amended to be effective February 17, 2004; amended to be effective March 2, 2005.

SUBCHAPTER B

MINIMUM STANDARDS FOR FIRE INVESTIGATOR CERTIFICATION

§431.201. Minimum Standards for Fire Investigation Personnel.

- (a) Fire protection personnel who are appointed fire investigation duties must be, as a minimum, certified as a structure fire protection personnel or fire investigator by the commission.
- (b) Prior to being appointed to fire investigation duties, personnel who are not certified as structure fire protection personnel must complete a commission approved basic fire investigator training program and successfully pass the commission examination pertaining to that curriculum.
- (c) Individuals holding a Fire Investigator certification shall be required to comply with the continuing education requirements in §441.15 of this title (relating to Continuing Education Requirements for Arson Investigator or Fire Investigator).
- (d) Individuals certified under this subchapter shall limit their investigation to determining fire cause and origin. If evidence of a crime is discovered, custody and control of the investigation shall be immediately transferred to a certified arson investigator or licensed peace officer.
- (e) Individuals who previously held arson investigator certification, who no longer hold a current commission as a peace officer, will qualify for certification as a fire investigator of similar level upon notice to the commission. To obtain a printed certificate the individual will be required to make application to the commission.

Source: The provisions of this §431.201 adopted to be effective November 1, 1998, amended to be effective December 27, 2001, amended to be effective December 24, 2002; amended to be effective May 21, 2006.

§431.203. Minimum Standards for Fire Investigator Certification.

- (a) In order to be certified by the Commission as a Fire Investigator an individual must complete the requirements specified in §431.3(a)(3) or (4) of this title (relating to Minimum Standards for Basic Arson Investigator Certification).
- (b) A person who holds or is eligible to hold a certificate as a Fire Investigator may be certified as an Arson Investigator by meeting the requirements of Chapter 431, Subchapter A, but shall not be required to repeat the applicable examination requirements.

Source: The provisions of this §431.203 adopted to be effective November 1, 1998; amended to be effective September 2, 2003; amended to be effective March 2, 2005; amended to be effective May 26, 2005; 33 TexReg 660, amended to be effective August 17, 2008.

§431.205. Minimum Standards for Intermediate Fire Investigator Certification.

- (a) Applicants for Intermediate Fire Investigator must complete the following requirements:
 - (1) hold as a prerequisite a Basic Fire Investigator Certification as defined in §431.203 of this title (relating to Minimum Standards for Fire Investigator Certification); and
 - (2) acquire a minimum of four years of fire protection experience and complete the training listed in one of the following options:

- (A) Option 1—Successfully complete six semester hours of fire science or fire technology from an approved Fire Protection Degree Program and submit documentation as required by the commission that the courses comply with subsections (b) and (c) of this section; or
 - (B) Option 2—Completion of coursework from either the A-List or the B-List courses. Acceptable combinations of courses are as follows: two A-List courses; or eight B-List courses; or one A-List and four B-List courses. (See the exception outlined in subsection (c) of this section.); or
 - (C) Option 3—Completion of coursework from either the A-List or the B-List courses in combination with college courses in fire science or fire protection. Acceptable combinations of courses are three semester hours meeting the requirements of Option 1 with either one A-List course or four B-List courses. (See the exception outlined in subsection (c) of this section.)
- (b) Non-traditional credit awarded at the college level, such as credit for experience or credit by examination obtained from attending any school in the commission’s Certification Curriculum Manual or for experience in the fire service, may not be counted toward this level of certification.
 - (c) The training required in this section must be in addition to any training used to qualify for any lower level of Fire Investigator Certification. Repeating a course or a course of similar content cannot be used towards this level of certification.

Source: The provisions of this §431.205 adopted to be effective August 5, 2004.

§431.207. Minimum Standards for Advanced Fire Investigator Certification.

- (a) Applicants for Advanced Fire Investigator must complete the following requirements:
 - (1) hold as a prerequisite an Intermediate fire Investigator Certification as defined in §431.203 of this title (relating to Minimum Standards for Fire Investigator Certification); and
 - (2) acquire a minimum of eight years of fire protection experience and complete the training listed in one of the following options:
 - (A) Option 1—Successfully complete six semester hours of fire science or fire technology from an approved Fire Protection Degree Program and submit documentation as required by the commission that the courses comply with subsections (b) and (c) of this section; or
 - (B) Option 2—Completion of coursework from the either A-List or the B-List courses. Acceptable combinations of courses are as follows: two A-List courses; or eight B-List courses; or one A-List and four B-List courses. (See the exception outlined in subsection (c) of this section.); or
 - (C) Option 3—Completion of coursework from either the A-List the B-List courses in combination with college courses in fire science or fire protection. Acceptable combinations of courses are three semester hours meeting the requirements of Option 1 with either one A-List course or four B-List courses. (See the exception outlined in subsection (c) of this section.)
- (b) Non-traditional credit awarded at the college level, such as credit for experience or credit by examination obtained from attending any school in the commission’s Certification Curriculum Manual or for experience in the fire service, may not be counted toward this level of certification.

- (c) The training required in this section must be in addition to any training used to qualify for any lower level of Fire Investigator Certification. Repeating a course or a course of similar content cannot be used towards this level of certification.

Source: The provisions of this §431.207 adopted to be effective August 5, 2004.

§431.209. Minimum Standards for Master Fire Investigator Certification.

- (a) Applicants for Master Fire Investigator Certification must complete the following requirements:
 - (1) hold as a prerequisite an Advanced Fire Investigator Certification as defined in §431.207 of this title (relating to Minimum Standards for Advanced Fire Investigator Certification); and
 - (2) acquire a minimum of twelve years of fire protection experience, and sixty college semester hours or an associate degree, which includes at least eighteen college semester hours in fire science subjects.
- (b) College level courses from both the upper and lower division may be used to satisfy the education requirement for Master Fire Investigator Certification.

Source: The provisions of this §431.209 adopted to be effective August 5, 2004.

§431.211. International Fire Service Accreditation Congress (IFSAC) Seal -- Fire Investigator.

- (a) Individuals holding a current commission Fire Investigator certification may be granted an International Fire Service Accreditation Congress (IFSAC) seal as a Fire Investigator by making application to the commission for the IFSAC seal and paying applicable fees.
- (b) Individuals completing a commission-approved basic fire investigator program and passing the applicable state examination may be granted an IFSAC seal as a Fire Investigator by making application to the commission for the IFSAC seal and paying applicable fees.

Source: The provisions of this §431.211 adopted to be effective August 5, 2004; amended to be effective March 2, 2005.

6. Discussion and possible recommendation regarding proposed rule changes to 37 TAC, Chapter 435, Fire Fighter Safety, including, but not limited to §435.1, Protective Clothing.

Chapter 435
FIRE FIGHTER SAFETY

§435.1. Protective Clothing.

- (a) A regulated fire department shall:
 - (1) purchase, provide, and maintain a complete set of protective clothing for all fire protection personnel who would be exposed to hazardous conditions from fire or other emergencies or where the potential for such exposure exists. A complete set of protective clothing shall consist of garments including bunker coats, bunker pants, boots, gloves, helmets, and protective hoods, worn by fire protection personnel in the course of performing fire-fighting operations;
 - (2) ensure that all protective clothing which are used by fire protection personnel assigned to fire suppression duties comply with the minimum standards of the National Fire Protection Association suitable for the tasks the individual is expected to perform. The National Fire Protection Association standard applicable to protective clothing is the standard in effect at the time the entity contracts for new, rebuilt, or used protective clothing; and
 - (3) maintain and provide upon request by the Commission, a departmental standard operating procedure regarding the use, selection, care, and maintenance of protective clothing which complies with NFPA 1851, Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles.
- (b) An entity may continue to use protective clothing in use or contracted for before a change in the National Fire Protection Association standard, unless the Commission determines that the protective clothing constitutes an undue risk to the wearer, in which case the Commission shall order that the use be discontinued and shall set an appropriate date for compliance with the revised standard.
- (c) Protective clothing in use or contracted for prior to January 1, 2002, shall be exempted from the record keeping requirements contained in Section 2.3, Records, of NFPA 1851.
- (d) In accordance with §419.043, Texas Government Code and subsection (b) of this section as set out hereinabove and consistent with past practice with respect to the implementation of NFPA standards when immediate implementation of a standard as written is impractical for Texas, the modifications contained in Sections 10.1.2, 10.1.3, and 10.1.3.1 of the 2008 Edition of NFPA 1851 (effective June 24, 2007) shall be implemented as follows:
 - (1) with respect to Section 10.1.2, structural fire fighting ensembles and ensemble elements shall be retired in accordance with Section 10.2.1 of the 2008 Edition of NFPA 1851, no more than 12 years from the date the ensembles or ensemble elements were manufactured, or no more than 10 years from the date the ensemble or ensemble elements were first put into service;
 - (2) with respect to Section 10.1.3, proximity fire fighting ensembles and ensemble elements shall be retired in accordance with Section 10.2.1 of the 2008 Edition of NFPA 1851, no more than 12 years from the date the ensembles or ensemble elements were manufactured, or no more than ten years from the date the ensemble or ensemble elements were first put into service; and
 - (3) with respect to Section 10.1.3.1, the radiant reflective outer shells shall be retired in accordance with Section 10.2.1 of the 2008 Edition of NFPA 1851, no more than 7 years from the date the outer shells are manufactured or no more than 5 years from the date the outer shells were first put into service.
- (e) Subsections (d) and (e) of this section will expire March 1, 2011.

Source Note: *The provisions of this §435.1 adopted to be effective November 1, 1998, amended to be effective May 23, 1999, amended to be effective March 8, 2001, amended to be effective March 24, 2002, amended to be effective March 10, 2003; amended to be effective February 23, 2009.*

§435.3. Self-Contained Breathing Apparatus.

The employing entity shall:

- (1) purchase, provide, and maintain a complete self-contained breathing apparatus for each on-duty fire protection personnel who engage in operations where IDLH atmospheres may be encountered, where the atmosphere is unknown or would be exposed to hazardous atmospheres from fire or other emergencies or where the potential for such exposure exists;
- (2) ensure that all self-contained breathing apparatus used by fire protection personnel complies with the minimum standards of the National Fire Protection Association identified in NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire Fighters.
 - (A) the National Fire Protection Association standard applicable to a self-contained breathing apparatus is the standard in effect at the time the entity contracts for new, rebuilt, or used self-contained breathing apparatus;
 - (B) an entity may continue to use a self-contained breathing apparatus in use or contracted for before a change in the National Fire Protection Association standard, unless the Commission determines that the continued use of the self-contained breathing apparatus constitutes an undue risk to the wearer, in which case the Commission shall order that the use be discontinued and shall set an appropriate date for compliance with the revised standard;
- (3) develop an air quality program that complies with the most recent edition of the NFPA 1989 Standard on Breathing Air Quality for Emergency Services Respiratory Protection;
- (4) maintain and supply upon request by the Commission, records and reports documenting compliance with Commission requirements concerning self-contained breathing apparatus and breathing air. Records of all tests shall be made and the records shall be retained for a period of no less than three years;
- (5) maintain and provide upon request by the Commission, a departmental standard operating procedure regarding the use of self-contained breathing apparatus; and
- (6) maintain and provide upon request by the Commission, a department standard operating procedure regarding the selection, care, and maintenance of self-contained breathing apparatus that complies with the most recent edition of the NFPA 1852 Standard on Selection, Care, and Maintenance of Open-Circuit Self-Contained Breathing Apparatus (SCBA).

Source Note: *The provisions of this §435.3 adopted to be effective November 1, 1998, 23 TexReg 10899; amended to be effective May 23, 1999, 24 TexReg 3863; amended to be effective October 11, 2000, 25 TexReg 10189; amended to be effective March 24, 2002, 27 TexReg 2242; amended to be effective March 10, 2003, 28 TexReg 2123; amended to be effective November 15, 2003, 28 TexReg 9885; amended to be effective November 8, 2005, 30 TexReg 7238; amended to be effective November 28, 2007, 32 TexReg 8531; 33 TexReg 6604, amended to be effective August 17, 2008.*

§435.5. Commission Recommendations.

The commission recommends that all employing entities use as a guide the following publications:

- (1) NFPA 1403 "Live Fire Training Evolutions";
- (2) NFPA 1500 "Fire Department Occupational Safety and Health Program;"
- (3) IAFF/IAFC - "Fire Service Joint Labor Management Wellness-Fitness Initiative."

Source: The provisions of this §435.5 adopted to be effective November 1, 1998; amended to be effective March 27, 2006.

§435.7. Fire Department Staffing Studies.

- (a) Section 419.022(a)(4) Texas Government Code provides that the commission may "on request, assist in performing staffing studies of fire departments." Staffing studies must take into consideration all the objectives and missions of the fire department. The commission does not have the resources or the staff to directly assist in performing the necessary tasks to perform a staffing study. Many staffing studies have been developed that can be used to assist in evaluating the needs of a fire department.
- (b) A city should ultimately decide on the level of fire protection it is willing to provide to its citizens. The city and fire department should, as a minimum, address the needs of prevention, investigation and suppression as outlined in the appropriate NFPA Standards. That decision should be based on facts, the safety of its citizens, and the safety of the fire fighters providing that protection.
- (c) The commission will assist by maintaining information pertinent to fire department staffing. The information shall be maintained in the Ernest A. Emerson Fire Protection Resource Library at the Texas Commission on Fire Protection. Copies shall be made available, free of charge, to anyone requesting such information to the extent permitted by copyright laws.

Source Note: The provisions of this §435.7 adopted to be effective November 1, 1998.

§435.9. Personal Alert Safety System (PASS).

The employing entity shall:

- (1) purchase, provide, and maintain a PASS device for each on duty fire protection personnel who engage in operations where IDLH atmospheres may be encountered, or where the atmosphere is unknown, or where hazardous conditions from fire or other emergencies exist, or where the potential for such exposure exists;
- (2) ensure that all PASS devices used by fire protection personnel comply with the minimum standards of the National Fire Protection Association identified in NFPA 1982, Standard on Personal Alert Safety Systems (PASS) for Fire Fighters:
 - (A) the National Fire Protection Association standard applicable to a PASS device is the standard in effect at the time the entity contracts for new, rebuilt, or used PASS devices;
 - (B) an entity may continue to use a PASS device that meets the requirements of an earlier edition of NFPA 1982, unless the commission determines that the continued use of the PASS device constitutes an undue risk to the wearer, in which case the commission shall order that the use be discontinued and shall set an appropriate date for compliance with the revised standard;
- (3) ensure that the PASS device assigned to an individual user be inspected at the beginning of each duty period and before each use.
- (4) maintain and provide upon request by the commission, a departmental standard operating procedure regarding the proper use, selection, care and maintenance of PASS devices.

Source Note: The provisions of this §435.9 adopted to be effective March 24, 2002.

§435.11. Incident Management System (IMS)

- (a) The fire department shall develop, maintain and use an incident management system.
- (b) The incident management system shall:
 - (1) include a written operating procedure for the management of emergency incidents;
 - (2) require that the IMS be used at all emergency incidents;
 - (3) require operations to be conducted in a manner that recognizes hazards and assists in the prevention of accidents and injuries;
 - (4) require that all fire protection personnel be trained in the use of the IMS; and
 - (5) require that the IMS be applied to all drills, exercises and all other situations that involve hazards similar to those encountered at an actual emergency.
- (c) The IMS shall meet the requirements of the applicable sections of the National Fire Protection Association 1561, Standard on Fire Department Incident Management System.
- (d) The Commission recommends departments follow the National Incident Management System (NIMS) when developing their incident management system.

Source Note: The provisions of this §435.11 adopted to be effective March 24, 2002; amended to be effective March 2, 2005.

§435.13. Personnel Accountability System.

- (a) The fire department shall develop, maintain and use a personnel accountability system that provides for a rapid accounting of all personnel at an emergency incident.
- (b) The accountability system shall:
 - (1) require all fire protection personnel be trained in the use of the accountability system;
 - (2) require that the fire protection personnel accountability system be used at all incidents;
 - (3) require that all fire protection personnel operating at an emergency incident to actively participate in the personnel accountability system; and
 - (4) require that the incident commander be responsible for the overall personnel accountability system for the incident.
- (c) The fire department shall be responsible for developing the system components required to make the personnel accountability system effective.
- (d) The personnel accountability system shall meet the minimum standards required by the National Fire Protection Association 1561, Standard on Fire Department Incident Management System. If the standard is revised, the fire department shall have one (1) year from the effective date of the new standard to comply.

Source: The provisions of this §435.13 adopted to be effective March 24, 2002.

§435.15. Operating At Emergency Incidents.

- (a) The fire department shall develop, maintain and use a standard operating procedure for fire protection personnel operating at emergency incidents.
- (b) The standard operating procedure shall:
 - (1) specify an adequate number of personnel to safely conduct emergency scene operations;
 - (2) limit operations to those that can be safely performed by personnel at the scene;
 - (3) require all personnel to be trained in and use the standard operating procedures; and
 - (4) comply with §435.17 (Procedures for Interior Structural Fire Fighting).
- (c) The fire department may use standards established by the National Fire Protection Association for fire protection personnel operating at an emergency incident.

Source: The provisions of this §435.15 adopted to be effective March 24, 2002.

§435.17. Procedures for Interior Structural Fire Fighting (2-In/2-Out Rule).

- (a) The fire department shall develop written procedures that comply with the Occupational Safety and Health Administration's Final Rule, 29 CFR Section 1910.134(g)(4) by requiring:
 - (1) a team of at least four fire protection personnel must be assembled before an interior fire attack can be made when the fire has progressed beyond the incipient stage;
 - (2) at least two fire protection personnel to enter the IDLH atmosphere and remain in visual or voice (not radio) contact with each other;
 - (A) Visual means that the fire protection personnel must be close enough to see each other.
 - (B) Voice means that the fire protection personnel of the entry team must be close enough to speak to one another without the use of radios.
 - (3) at least two fire protection personnel remain located outside the IDLH atmosphere to perform rescue of the fire protection personnel inside the IDLH atmosphere;
 - (4) all fire protection personnel engaged in interior structural fire fighting use self-contained breathing apparatus and be clothed in a complete set of protective clothing as identified in Chapter 435;
 - (5) all fire protection personnel located outside the IDLH atmosphere be equipped with appropriate retrieval equipment where retrieval equipment would contribute to the rescue of the fire protection personnel that have entered the IDLH atmosphere;
 - (6) one of the outside fire protection personnel must actively monitor the status of the inside fire protection personnel and not be assigned other duties. The second outside fire protection personnel may be assigned to an additional role, including, but not limited to, incident commander, safety officer, driver-operator, command technician or aide, or fire fighter/EMS personnel, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any fire protection personnel working at the scene;

- (7) the fire protection personnel outside the IDLH atmosphere must remain in communication (including, but not limited to, radio) with the fire protection personnel in the IDLH atmosphere. Use of a signal line (rope) as a communications instrument for interior fire fighting is not permitted by the commission. This does not preclude the use of rescue guide ropes (guide line or lifeline or by what ever name they may be called) used during structural searches; and
 - (8) each outside fire protection personnel must have a complete set of protective clothing and self-contained breathing apparatus, as identified in Chapter 435, immediately accessible for use if the need for rescue activities inside the IDLH atmosphere is necessary.
- (b) The fire department shall comply with the 2-in/2-out rule as described in this section except in an imminent life-threatening situation when immediate action could prevent the loss of life or serious injury before the team of four fire protection personnel are assembled.

Source: The provisions of this §435.17 adopted to be effective March 24, 2002.

§435.19. Enforcement of Commission Rules.

- (a) The Commission shall enforce all Commission rules at any time, including, but not limited to, Commission investigations, fire department inspections, or upon receiving a written complaint from an identified person or entity of an alleged infraction of a Commission rule.
- (b) The Commission shall not provide prior notification of an inspection to a fire department.
- (c) Upon receipt of a signed complaint alleging a violation of a Commission rule, the Commission shall have 30 days to initiate an investigation and report back to the complainant its progress.
- (d) Upon substantiating the validity of a written complaint, the Commission shall follow the procedures outlined in Government Code, Chapter 419, §419.011(b) and (c).

Source Note: The provisions of this §435.19 adopted to be effective March 24, 2002; 32 TexReg 8531, amended to be effective November 28, 2007.

§435.21. Fire Service Joint Labor Management Wellness-Fitness Initiative.

- (a) A fire department shall assess the wellness and fitness needs of the personnel in the department. The procedure used to make this assessment shall be written and made available for commission inspection.
- (b) A fire department shall develop and maintain a standard operating procedure to address those needs.
- (c) The approach to the fitness needs of the department shall be based on the local assessment and local resources.
- (d) The standard operating procedure shall be made available to the commission for inspection.

Source Note: The provisions of this §435.21 adopted to be effective October 1, 2006; 32 TexReg 4447, amended to be effective July 19, 2007.

§435.23. Fire Fighter Injuries.

- (a) A fire department shall report all Texas Workers' Compensation Commission reportable injuries that occur to on-duty regulated fire protection personnel on the Commission form.

- (b) Minor injuries are those injuries that do not result in the fire fighter missing more than one duty period or does not involve the failure of personal protective equipment. Minor injuries shall be reported within 30 business days of the injury event.
- (c) Major injuries are those that require the fire fighter to miss more than one duty period. Major injuries shall be reported within five business days of the injury event.
- (d) Investigatable injuries are those resulting from the malfunction of personal protective equipment, failure of personal protective equipment to protect the fire fighter from injury, or injuries sustained from failure to comply with any provision of Commission mandated department SOPs. Investigatable injuries shall be reported within five business days of the injury event.
- (e) The regulated entity shall secure any personal protective equipment involved in a fire fighter injury and shall be made available to the Commission for inspection.

Source Note: *The provisions of this §435.23 adopted to be effective February 17, 2010, 35 TexReg 1289.*

From: Gallarneau, Cliff [mailto:cliffg@lionapparel.com]
Sent: Tuesday, January 19, 2010 1:45 PM
To: John (Jake) Soteriou
Cc: Miles (Skip) Skipper; Baker, Jim
Subject: Rubber boot supply concerns notification to TCFP

Mr. Soteriou,

I was advised by Mr. Skipper that I needed to send a message to you informing you that over the past couple of weeks a supply problem for the procurement of NFPA 1971 rubber boots is becoming a concern. We have been having difficulty purchasing rubber boots in the Texas market and when broadening our search outside of Texas we are incurring challenges to purchase rubber boots to supply our needs for fire academy students.

Once source of a major know brand tells me rubber tree shortage, supply chain outside of the US is playing a roll in this shortage problem. Deliveries are being pushed back 30 days or more from expected delivery dates.

Mr. Skipper informed me that the Advisory Committee has to review the concern and then make a recommendation to the Commissioners at a board meeting so with this message I am making you aware of a potential supply problem so the Advisory Committee can deem whether an investigation needs to be done and if they agree then put forth a solution, such as allowing the use of 2000 edition rubber boots able to be used as long as they are in serviceable condition until the supply problem corrects itself.

Regards,

Keeping you Safer, Longer

Cliff Gallarneau

Cliff Gallarneau

Lion TotalCare

Director of Sales

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7. Discussion and possible recommendation on proposals regarding firefighting helmets and minimum THL for bunker gear being considered by the NFPA 1971 Committee.

8. Discussion and possible action on future meeting dates, agenda items, and locations.

9. Adjourn meeting.