

FIRE FIGHTER II

Approved by the Statewide Training and
Education Advisory Committee



Adopted by the State Board of Fire Services



INSTRUCTOR GUIDE

July 2001 Edition



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FIRE FIGHTER II

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FIRE FIGHTER II

SFT MISSION STATEMENT

The mission of State Fire Training is to enable the California fire service to safely protect life and property through education, training, and certification.

CALIFORNIA STATE BOARD OF

The California Fire Service Training and Education System (CFSTES) was established to provide a single statewide focus for fire service training in California. CFSTES is a composite of all the elements that contribute to the development, delivery, and administration of training for the California Fire Service. The authority for the central coordination of this effort is vested in the Training Division of the California State Fire Marshal's Office with oversight provided by the State Board of Fire Services.

The role of CFSTES is one of facilitating, coordinating, and assisting in the development and implementation of standards and certification for the California fire service. CFSTES manages the California Fire Academy System by providing standardized curriculum and tests; accredited courses leading to certification; approved standardized training programs for local and regional delivery; administering the certification system; and publishing Career Development Guides, Instructors Guides, Student Manuals, Student Supplements, and other related support materials.

This system is as successful and effective as the people involved in it are. It is a fire service system developed by the fire service, for the fire service... and we believe it is the best one in the country.

FIRE SERVICES

ACKNOWLEDGMENTS

The State Fire Training Curriculum Development Division coordinated the development of the material contained in this guide. Before its publication, the Statewide Training and Education Advisory Committee (STEAC) and the State Board of Fire Services (SBFS) approved this guide. This guide is appropriate for fire service personnel and for personnel in related occupations that are pursuing State Fire Training certification.

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FIRE FIGHTER II

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"We gratefully acknowledge the hard work and accomplishments of those before us who built the solid foundation on which this program continues to grow."

COURSE STRUCTURE

The revision and suggested standardization of the Fire Fighter II curriculum was a massive undertaking, geographically as well as organizationally. It required the commitment of numerous individuals and their departments throughout California as well as the input of fire service professionals and practitioners.

The Fire Fighter II curriculum was updated and developed to provide fire fighters with the base level of knowledge necessary to perform successfully. All involved have freely shared their expertise to create an updated, standardized curriculum that will benefit not only the fire fighter, but his or her department as well.

INSTRUCTOR REQUIREMENTS

Fire service personnel may qualify to teach the Fire Fighter I and II programs by meeting the criteria listed below. Additional courses not included in the Fire Fighter I and II instructor guides, but required for certification, may have additional instructor requirements. Refer to State Fire Training's Policies and Procedures Manual.

1. To qualify as a Fire Fighter Instructor, the following criteria must be met:
 - a) Instructor Training (any one of the following five options)
 - 1) Completed Fire Instructor 1A and 1B
 - 2) Have a valid Community College teaching credential
 - 3) Completed the UC/CSU 60-hour Techniques of Teaching course
 - 4) Completed the NFA's Fire Service Instructional Methodology course
 - 5) Completed four semester units of upper division credit in educational materials, methods, and curriculum development
 - b) Occupational Experience
 - 1) Have a minimum of 2 years suppression experience.
2. Registration Process
 - a) Fire Fighter Instructors are not registered with the OSFM.
 - b) Each department's Fire Chief has the responsibility to ensure the individuals teaching the Fire Fighter course(s) meets the criteria listed above.



FIRE FIGHTER II

RESPONSIBILITIES

1. Ensuring all objectives of the course curriculum are met.
2. Teaching 100% of the course. Due to the length of Fire Fighter training, more than one qualified instructor may be utilized.
3. Ensuring all administrative requirements are completed in accordance with printed guidelines.
4. Proctoring any performance and/or written test when utilized.

MAINTENANCE

1. Maintain subject area involvement either by teaching or operational assignment.
2. Agree to comply with all published State Fire Training policies and procedures of the California State Fire Marshal's Office.

INTRODUCTION TO THE MANUAL

This publication is intended to serve as an instructor guide. Material on these pages is intended to serve as an outline of instruction in lesson plan form. For each topic identified in the course outline, a lesson plan has been developed that contains: a time frame, level of instruction, behavioral objective, materials needed, references, preparation statement, and lesson content.

- **TIME FRAME:** The estimated duration required for in-class presentation.
- **LEVEL OF INSTRUCTION:** Identifies the instructional level that the material was designed to fulfill. Obviously, you have the latitude to increase the level based on available time, local conditions, and the students' apperceptive base.
- **BEHAVIORAL OBJECTIVE:** The behavioral objective is a statement of the student's performance desired at the end of instruction. You must ensure that enough information is given in the presentation and/or activities to enable the student to perform according to the goal.
- **MATERIALS NEEDED:** This should be a complete list of everything you will need to present the lesson, including visual aids, tests, and so on.
- **REFERENCES:** These are the specific references the curriculum development team used when developing the lesson plan. In addition, references may be listed as additional study aids for instructors to enhance the lesson -- books, manuals, bulletins, scripts, visual aid utilization plans and the like.
- **PREPARATION:** The motivational statements in this section connect the student with the lesson plan topic through examples or illustrations relating to their occupation, injury, and even mortality. You may modify this section to better fit your students' environment.
- **LESSON CONTENT:** Includes information used in the four-step method of instruction.

<u>TECHNICAL LESSON PLANS</u>	
<u>Presentation</u> Everything you say or display Content Notes	<u>Application</u> Everything the student participates in Questions Classroom Exercises Audiovisual Cues
<u>MANIPULATIVE LESSON PLANS</u>	
<u>Operations</u> Actions to be performed	<u>Key Points</u> The "how" or tricks of the trade Safety practices

COURSE OUTLINE

COURSE OBJECTIVES: To provide the student with ...

- a) The knowledge and skills necessary to safely perform the tasks required of an entry-level fire fighter, including completing a basic incident report.
- b) The role of fire prevention at the engine company level, including preparing a pre-incident plan.
- c) The knowledge and skills necessary to coordinate an interior attack crew on a structure fire and call for additional resources.
- d) The knowledge and skills necessary to effectively control and extinguish ignitable liquid and flammable gas fires, operating as a member of a crew.
- e) The knowledge and skills necessary to safely maintain power plants, power tools, and lighting equipment.
- f) The knowledge and skills necessary to safely assist rescue operation crews, including rope rescue techniques.
- g) The knowledge and skills necessary to perform an annual service test on fire hose.
- h) The knowledge and skills necessary to test the operation and flow of a fire hydrant.

COURSE CONTENT:.....86:00

UNIT A: FIRE SERVICE ORGANIZATION AND RESPONSIBILITY

All information for this unit is received in Fire Fighter I

UNIT B: MISCELLANEOUS EQUIPMENT AND TOOLS

All information for this unit is received in Fire Fighter I

UNIT C: FIRE BEHAVIOR AND EXTINGUISHMENT THEORY

All information for this unit is received in Fire Fighter I

UNIT D: FIRE FIGHTER SAFETY (1:45)

- 1. Specialized protective equipment0:45
- 2. Procedures for positioning fire engines at an emergency scene.....1:00

UNIT E: SELF-CONTAINED BREATHING APPARATUS

All information for this unit is received in Fire Fighter I

UNIT F: PORTABLE FIRE EXTINGUISHERS

All information for this unit is received in Fire Fighter I

UNIT G: ROPES, KNOTS, AND HITCHES

All information for this unit is received in Fire Fighter I

UNIT H HOSE, NOZZLES, AND APPLIANCES (4:00)

- 1. How to make an intake pump connection using a 2½" hoseline0:30
- 2. How to make an intake pump connection using large diameter hose1:00

FIRE FIGHTER II

- 3. How to make a four-way hydrant valve connection.....1:00
- 4. Procedures for testing fire hose1:00
- 5. Procedures for maintaining hose records0:30

UNIT I: GROUND LADDERS

All information for this unit is received in Fire Fighter I

UNIT J: FORCIBLE ENTRY

All information for this unit is received in Fire Fighter I

UNIT K: RESCUE (21:00)

- 1. Electrical emergencies0:15
- 2. Escalator emergencies0:15
- 3. Components of elevators0:45
- 4. Elevator safety awareness.....0:15
- 5. Procedures for elevator extrication0:30
- 6. Procedures for converting an elevator from independent to emergency service0:15
- 7. Industrial accidents0:15
- 8. Cave, tunnel, and mine rescue awareness0:30
- 9. Water and ice rescue awareness.....1:00
- 10. Trench rescue operations awareness2:00
- 11. Assisting rescue operations at an incident.....0:15
- 12. Considerations for tunneling through debris1:00
- 13. Basic considerations for constructing shafts in debris1:00
- 14. Considerations for debris removal from a collapsed building.....1:00
- 15. Emergencies requiring rope rescue techniques.....0:15
- 16. Basic rope rescue safety.....0:15
- 17. Characteristics and functions of rescue/life safety hardware0:30
- 18. Inspection and maintenance of rescue/life hardware.....0:15
- 19. How to tie a pelvic harness0:15
- 20. How to secure a victim to a rescue litter using the chest, pelvic, and exterior lash methods.....0:30
- 21. How to rig a rescue litter for raising or lowering a victim in a horizontal position0:15
- 22. Introduction to anchor systems0:30
- 23. How to tie a lark's foot anchor sling0:15
- 24. How to tie a single loop anchor sling0:15
- 25. How to tie a 3-bight anchor sling.....0:15
- 26. How to tie a multi-loop anchor sling0:15
- 27. How to tie a full strength tie off.....0:15
- 28. How to construct a back-tied anchor system0:15
- 29. How to construct a two-point self-adjusting anchor system0:30
- 30. How to construct a three-point self-adjusting anchor system.....0:30
- 31. Introduction to the belay system0:30
- 32. How to construct and operate a belay system0:30

FIRE FIGHTER II

33.	Introduction to the rack, pulley, mariner's hitch (RPM).....	0:15
34.	How to attach a prusik loop to a RPM for use as a ratchet device in a haul system.....	0:15
35.	How to attach a three-wrap prusik hitch to a rescue rope.....	0:15
36.	How to attach and operate a figure eight descender as part of a RPM.....	0:15
37.	How to attach a Gibbs ascender to a RPM for use as a ratchet device in a haul system.....	0:15
38.	How to attach and operate a brake bar rack as part of a RPM.....	0:15
39.	How to construct and operate a mariner's hitch as part of a RPM.....	0:30
40.	Introduction to rope rescue lowering and raising systems.....	1:00
41.	How to construct and operate a lowering system.....	0:45
42.	Mechanical advantage systems using the 3:1 piggy back and 3:1 z-rig, including directional changes.....	0:15
43.	How to construct a z-rig raising system.....	0:30
44.	How to construct a 3:1 piggy back raising system.....	0:30
45.	How to change a lowering system to a raising system (z-rig).....	0:15
46.	Personal protective equipment for rescue scenarios.....	0:15

UNIT L: VENTILATION

All information for this unit is received in Fire Fighter I

UNIT M: FIRE CONTROL (2:15)

1.	Strategy and tactics at emergencies.....	1:00
2.	Factors that determine the size and type of fire stream needed.....	0:30
3.	Safety precautions when advancing hoselines into fire areas.....	0:15
4.	Causes of poor foam generation.....	0:30

UNIT N: SALVAGE AND OVERHAUL

All information for this unit is received in Fire Fighter I

UNIT O: FIRE PROTECTION WATER SYSTEMS (4:30)

1.	Types of apparatus and equipment needed for providing water at rural locations....	0:30
2.	Procedures for water shuttle operations.....	0:30
3.	Methods used to determine water system flow pressure.....	0:30
4.	How to use a pitot tube.....	0:30
5.	Methods for determining fire hydrant discharge capacity.....	1:00
6.	Causes of pressure loss in water systems.....	1:00
7.	How to maintain wet and dry barrel hydrants.....	0:30

UNIT P: FIRE PROTECTION SYSTEMS (1:00)

1.	Features of a supervised fire alarm system.....	1:00
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UNIT Q: FIRE PREVENTION AND INVESTIGATION (19:30)

1.	Fire incident reports.....	1:00
2.	Company fire inspection reports.....	1:00
3.	Procedures for performing routine company fire inspections.....	1:00

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4.	Basic home safety inspections.....	1:00
5.	Benefits of home fire sprinkler systems	1:00
6.	Fire fighter standby/watch procedures.....	1:00
7.	Fire cause determination	3:00
8.	Types of building construction	1:00
9.	Structural features that may influence fire spread and safety	3:00
10.	Determining occupancy types.....	2:00
11.	Building construction features.....	2:00
12.	Pre-incident planning	1:00
13.	Drawings and sketches of buildings for pre-incident planning	0:30
14.	Recognition, collection, and preservation of evidence	1:00

UNIT R: COMMUNICATIONS

All information for this unit is received in Fire Fighter I

UNIT S: VEHICLE EXTRICATION

All information for this unit is received in Fire Fighter I

UNIT T: WILDLAND FIRE FIGHTING

All information for this unit is received in Fire Fighter I

UNIT U: EMERGENCY CARE

All information for this unit is received in Fire Fighter I

UNIT V: INCIDENT COMMAND SYSTEM

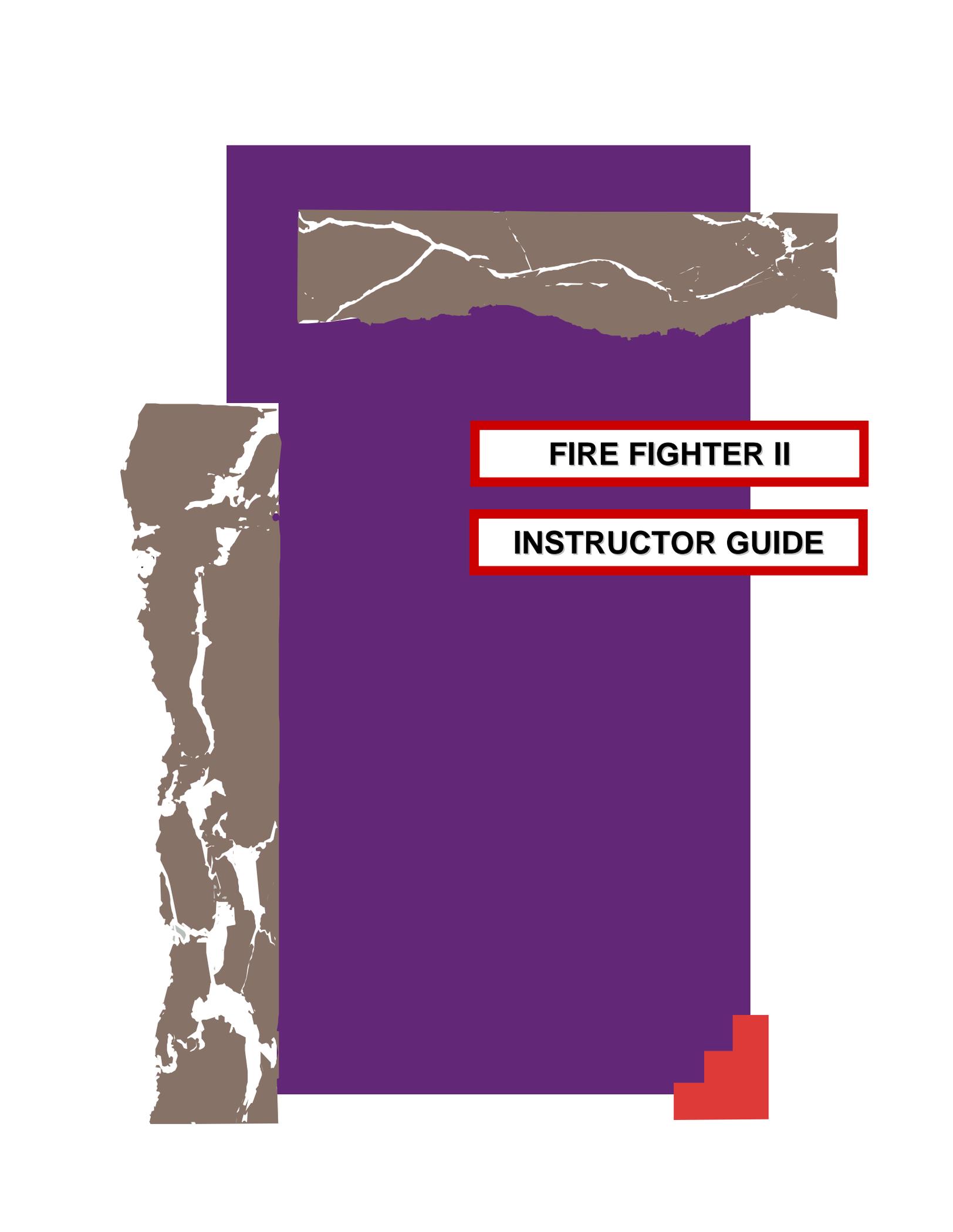
All information for this unit is received in Fire Fighter I

UNIT W: CONFINED SPACE RESCUE OPERATIONS (32:00)

Complete a Confined Space Rescue Operations course32:00

UNIT X: HAZARDOUS MATERIALS

All information for this unit is received in Fire Fighter I



FIRE FIGHTER II

INSTRUCTOR GUIDE

TOPIC: SPECIALIZED PROTECTIVE EQUIPMENT

TIME FRAME: 0:45

LEVEL OF INSTRUCTION: Level I

AUTHORITY: 1997 NFPA 1001 3-1.1.2 and SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the types of specialized personal protective equipment and the safety precautions which must be observed by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Hazardous Materials For First Responders, IFSTA, Second Edition, Chapter 5

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Hazardous Materials For First Responders, IFSTA, Second Edition

PREPARATION: Emergency incidents present unusual threats that may result in immediate or long-term injury. Safe operations at an incident must begin with a positive attitude that is created at the supervisory level and understood at the company level. The exotic materials in industry and in our own homes are so toxic that, even with full personal protective equipment, today's fire fighters are at a much greater risk than the overall population to contract cancer (129% greater chance of brain tumors, 116% greater chance of prostate cancer, and 10.8% greater chance of lung cancer) in their lifetimes. It is important that fire fighters recognize the different types and uses of personal protective equipment. For example, structural PPE is not designed for entry into areas that contain special toxic or extreme temperature hazards.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. EPA CLASSIFICATION SYSTEM</p> <p>A. Recognized by</p> <ol style="list-style-type: none"> 1. National Institute of Occupational Safety and Health (NIOSH) 2. Occupational Safety and Health Administration (OSHA) 3. United State Coast Guard (USCG) <p>B. Level A protective equipment</p> <ol style="list-style-type: none"> 1. Highest level of protection against <ol style="list-style-type: none"> a) Vapors b) Gases c) Mists d) Particles 2. Required when working directly with a substance that poses a severe threat of injury from contact 3. Design <ol style="list-style-type: none"> a) Totally encapsulating one-piece suit <ol style="list-style-type: none"> 1) Envelops the wearer and the SCBA b) Boots and gloves may be <ol style="list-style-type: none"> 1) Integral 2) Attached and replaceable 3) Separate 4. Safety considerations <ol style="list-style-type: none"> a) Does not allow body heat to escape <ol style="list-style-type: none"> 1) May contribute to heat stress 2) Need for cooling garments 	<p>What is the design for Level A protection?</p> <p>What are some safety considerations?</p>

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PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 3) Impair worker mobility, vision, and communication b) Wearing closed circuit SCBA <ul style="list-style-type: none"> 1) Allow sufficient time to decontaminate before running out of air C. Level B protective equipment <ul style="list-style-type: none"> 1. Protects against splashes from a hazardous chemical 2. Worn when Level A is not required 3. Design <ul style="list-style-type: none"> a) Wrists, ankles, facepiece and hood, and waist are secured to prevent entry of splashed liquid b) Type of chemical determines the types of gloves and boots needed <ul style="list-style-type: none"> 1) May or may not be attached 4. Safety considerations <ul style="list-style-type: none"> a) Do not use where gas-tight or pervasive splashing protection is required b) May contribute to heat stress c) Tape/seal connections between pant cuffs and boots and between gloves and sleeves d) Does not protect against gases and vapors 	<p>What types of problems can be anticipated?</p> <p>What is the design for Level B protection?</p> <p>What are some safety considerations?</p>

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PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 3. Turnout coat and pants 4. Gloves 5. Protective hood 6. Protective boots <p>C. Safety considerations</p> <ul style="list-style-type: none"> 1. May provide only short-term exposure 2. Not corrosive resistant nor vapor tight 3. Acids and bases can dissolve or deteriorate outer layers 4. Gases can penetrate 5. Chemicals can be absorbed and remain in the clothing <ul style="list-style-type: none"> a) Repeated exposures b) Later reaction with another chemical 6. Decontamination is difficult <p>III. CHEMICAL-PROTECTIVE CLOTHING</p> <p>A. Protect against specific chemical hazards</p> <ul style="list-style-type: none"> 1. Not all 2. Manufacturer provides a list of chemicals with which the suit is compatible <p>B. Provide overall body protection</p> <p>C. Design</p> <ul style="list-style-type: none"> 1. Reusable <ul style="list-style-type: none"> a) Can be decontaminated, tested, and put back in service 2. Limited-use <ul style="list-style-type: none"> a) Also known as disposable b) Can be reused if not contaminated or damaged 	<p>What are some safety considerations?</p>

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PRESENTATION	APPLICATION
<p style="padding-left: 40px;">c) Can retain some chemicals at the molecular level</p> <p>D. Safety considerations</p> <ol style="list-style-type: none"> 1. Should be used in conjunction with any other protective equipment required by the situation <p>E. NFPA has developed three performance standards</p> <ol style="list-style-type: none"> 1. Vapor-protective suits 2. Liquid-splash-protective suits 3. Support-function protective garments <p>IV. VAPOR-PROTECTIVE SUITS</p> <p>A. Protect against specified chemicals in vapor and liquid-splash environments</p> <p>B. <u>NFPA Standard #1991</u></p> <ol style="list-style-type: none"> 1. Sets the minimum design criteria <p>C. Made from a variety of special materials</p> <p>D. Primarily used as part of a Level A protective ensemble</p> <ol style="list-style-type: none"> 1. Must be worn with SCBA <p>E. Minimum chemical certification</p> <ol style="list-style-type: none"> 1. Acetone 2. Acetonitrile 3. Anhydrous ammonia 4. Carbon disulfide 5. Chlorine 6. Dichloromethane 7. Diethylamine 8. Dimethylformamide 9. Ethyl acetate 10. Hexane 11. Methanol 	

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PRESENTATION	APPLICATION
<p>12. Nitrobenzene 13. Sodium hydroxide 14. Sulfuric acid 15. Tetrachloroethylene 16. Tetrahydrofuran 17. Toluene</p> <p>F. Safety considerations</p> <ol style="list-style-type: none"> 1. Do not allow body heat to escape <ol style="list-style-type: none"> a) Can contribute to heat stress 2. Impaired <ol style="list-style-type: none"> a) Mobility b) Vision c) Communication 3. First responders at the awareness and operational levels do not have sufficient training to operate in conditions requiring the use of vapor-protective suits <p>V. LIQUID-SPLASH-PROTECTION SUITS</p> <p>A. Protect against chemical liquid splashes</p> <ol style="list-style-type: none"> 1. But not against chemical vapors or gases <p>B. <u>NFPA Standard #1992</u></p> <ol style="list-style-type: none"> 1. Sets the minimum design criteria <p>C. Made of the same types of materials used for vapor-protective suits</p> <p>D. Depending on the situation, can be used with any one of the following</p> <ol style="list-style-type: none"> 1. SCBA 2. Airline 	<p>What are some safety considerations?</p>

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PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 3. Full-face, air-purifying canister-equipped respirator E. May be used in decontamination procedures that require greater protection than the support-function garments offer F. Minimum chemical certification <ul style="list-style-type: none"> 1. Acetone 2. Diethylamine 3. Ethyl acetate 4. Hexane 5. Sodium hydroxide 6. Sulfuric acid 7. Tetrahydrofuran 8. Toluene <p>VI. SUPPORT-FUNCTION PROTECTIVE GARMENTS</p> <ul style="list-style-type: none"> A. Protects personnel working outside the hot zone B. Cannot be used for protection against <ul style="list-style-type: none"> 1. Radiological, biological, or cryogenic materials 2. Immersion in liquids 3. Flammable, explosive, or hazardous chemical vapor atmospheres C. <u>NFPA Standard #1993</u> <ul style="list-style-type: none"> 1. Sets the minimum design criteria D. May be fully encapsulating E. Worn with SCBA F. Minimum chemical certification <ul style="list-style-type: none"> 1. Acetone 2. Diethylamine 3. Ethyl acetate 4. Hexane 	

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PRESENTATION	APPLICATION
<p>5. Sodium hydroxide</p> <p>6. Sulfuric acid</p> <p>7. Tetrahydrofuran</p> <p>8. Toluene</p> <p>VII. HIGH-TEMPERATURE CLOTHING</p> <p>A. Designed for situations where the levels exceed the capabilities of standard PPE</p> <ol style="list-style-type: none"> 1. Each type has a specific use 2. Not interchangeable <p>B. Will not protect against chemical hazards</p> <p>C. Three basic types</p> <ol style="list-style-type: none"> 1. Approach suits <ol style="list-style-type: none"> a) Used for fire fighting operations that involve high levels of <u>radiated heat</u> 2. Proximity suits <ol style="list-style-type: none"> a) Permit close approach to fires <ol style="list-style-type: none"> 1) Rescue 2) Suppression 3) Property conservation 3. Fire entry suits <ol style="list-style-type: none"> a) Highly specialized garments b) Allow a person to work in total flame environment for short periods <p>D. Safety considerations</p> <ol style="list-style-type: none"> 1. Contributes to heat stress 2. Limits <ol style="list-style-type: none"> a) Vision b) Mobility 	<p>What are some safety considerations?</p>

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PRESENTATION	APPLICATION
<ul style="list-style-type: none"> c) Communication 3. Require frequent and extensive training <p>VIII. OTHER PROTECTION</p> <ul style="list-style-type: none"> A. Aprons, leggings, and sleeve protectors <ul style="list-style-type: none"> 1. Use <ul style="list-style-type: none"> a) Sampling, labeling, and analysis operations b) When there is a low probability of total body contact with contaminants 2. Design <ul style="list-style-type: none"> a) Fully sleeved and gloved apron b) Separate covering for arms and legs c) Commonly worn over nonencapsulating suits <ul style="list-style-type: none"> 1) Minimize potential for heat stress B. Blast and fragmentation suit <ul style="list-style-type: none"> 1. Use <ul style="list-style-type: none"> a) Protects against very small detonations 2. Design <ul style="list-style-type: none"> a) Blast and fragmentation vest b) Clothing c) Bomb blanket d) Bomb carriers 3. Safety considerations <ul style="list-style-type: none"> a) Does not provide hearing protection b) Use of bomb blankets may redirect the explosion C. Radiation contamination protective suit <ul style="list-style-type: none"> 1. Use <ul style="list-style-type: none"> a) Prevents skin contamination 	

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> b) Protects against alpha and beta particles 2. Safety consideration <ul style="list-style-type: none"> a) Does not protect against gamma particles D. Flame/fire retardant coveralls <ul style="list-style-type: none"> 1. Used by scene investigators <ul style="list-style-type: none"> a) Arson investigators b) Bomb personnel, etc. 2. Design <ul style="list-style-type: none"> a) Normally worn as an undergarment 3. Safety precautions <ul style="list-style-type: none"> a) Adds bulk when used as an undergarment b) May exacerbate heat stress c) Impairs mobility 	<p>What type of radiation does this suit not protect against?</p> <p>What type of support personnel may wear coveralls?</p>



FIRE FIGHTER II

SUMMARY:

There is no set rule for determining what type of personal protective equipment should be used. There are advantages and disadvantages in using any type of personal protective equipment. The fire fighter must be familiar with what types of personal protective equipment are available and their uses.

Each type of personal protective equipment has a specific purpose. Many, but not all are designed to protect against chemicals. The fire fighter needs to know what is available in their agency to deal with chemical, radiation, and fire emergencies.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Hazardous Materials For First Responders, IFSTA, First Edition, Chapter 4 in order to prepare yourself for the upcoming test. Study for our next session.

FIRE FIGHTER II

TOPIC:	PROCEDURES FOR POSITIONING FIRE ENGINES AT AN EMERGENCY SCENE
TIME FRAME:	1:00
LEVEL OF INSTRUCTION:	Level II
AUTHORITY:	SBFS
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of the procedures for positioning fire engines at the scene of an emergency by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Pumping Apparatus Driver/Operator</u> , IFSTA, First Edition, Chapter 5
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials
REFERENCES:	<ul style="list-style-type: none">• <u>Pumping Apparatus Driver/Operator</u>, IFSTA, First Edition, Chapter 5
PREPARATION:	Proper apparatus placement can benefit the operations at the emergency scene, where improper placement can be a burden to the entire operation. Improper placement, at best, will inconvenience other citizens trying to use the same roadway. At worst, it can kill people, including the driver/operator. This lesson is designed to give you key safety and positioning information that will benefit personnel and departmental performance.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. POSITIONING FIRE ATTACK PUMPERS</p> <p>A. No fire conditions evident</p> <ol style="list-style-type: none"> 1. Park near the main entrance to the occupancy 2. Allow fire personnel to enter the structure and investigate the situation <p>B. Fire conditions present, look for the best tactical position</p> <ol style="list-style-type: none"> 1. Departmental SOPs <ol style="list-style-type: none"> a) Make every effort to follow b) Will affect the placement of late-arriving apparatus 2. Rescue situations <ol style="list-style-type: none"> a) Facilitate timely deployment of ground ladders or aerial device 3. Water supply <ol style="list-style-type: none"> a) Near an external supply b) Supply located in a safe area <ol style="list-style-type: none"> 1) Not hazardous to the apparatus and crew 4. Method of attack <ol style="list-style-type: none"> a) If incident can be handled with preconnected handlines <ol style="list-style-type: none"> 1) Position so nozzle can reach the seat of the fire b) If master streams are used <ol style="list-style-type: none"> 1) Position so hoselines can supply them 	<p>What are some considerations when positioning apparatus for a fire attack?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> c) If turret is used <ul style="list-style-type: none"> 1) Position so the fire stream reaches its intended target 5. Exposures <ul style="list-style-type: none"> a) Allow fire streams to deploy and protect the exposures b) Don't allow the apparatus to become an exposure 6. Wind direction <ul style="list-style-type: none"> a) Upwind of the incident when possible <ul style="list-style-type: none"> 1) Driver/operate will not have to wear breathing apparatus while operating the vehicle 2) Reduces the possibility of the apparatus becoming an exposure 3) Less likelihood of hazardous materials contaminating the vehicle 7. Terrain <ul style="list-style-type: none"> a) Paved surface <ul style="list-style-type: none"> 1) Eliminates chance of apparatus getting stuck once the area is wet b) Uphill from the incident <ul style="list-style-type: none"> 1) Less wear on the pump when supplying hoseline downhill 2) Less likelihood of hazardous materials flowing under the apparatus 3) Exception <ul style="list-style-type: none"> • A wildland fire 8. Relocation potential <ul style="list-style-type: none"> a) Always leave yourself a way out 	

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>C. Other considerations</p> <ol style="list-style-type: none"> 1. Leave room for other vehicles and apparatus 2. Do not block equipment on other vehicles 3. Do not block back of truck companies that have to remove their ground ladder at the rear 4. Do not run over hose 5. Be aware of possible building collapse 6. Watch out for utilities <ol style="list-style-type: none"> a) Overhead electrical lines should have spotlights on them at night b) Elevated tower and meter 7. Fire behavior <ol style="list-style-type: none"> a) Backdraft/flashover situations b) If fire progresses, is apparatus in danger? <p>II. POSITIONING WILDLAND APPARATUS</p> <p>A. Unique situations</p> <p>B. Seldom positioned in the same spot for the duration</p> <ol style="list-style-type: none"> 1. May reposition many times 2. May attack a fire while moving <p>C. Structural protection</p> <ol style="list-style-type: none"> 1. Highest priority for most wildland fire fighting operations 2. Structures are often at the end of long, narrow driveways opening from rural lanes <ol style="list-style-type: none"> a) Surrounded by dry, flammable vegetation 3. Procedures <ol style="list-style-type: none"> a) Apparatus should be backed in 	<p>What are some concerns when placing apparatus at a wildland fire?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> b) Park off the roadway <ul style="list-style-type: none"> 1) Avoid blocking other fire apparatus or evacuating vehicles c) Scrape away fuel, if necessary <ul style="list-style-type: none"> 1) Avoid parking in flammable vegetation d) Park on the lee side of the structure <ul style="list-style-type: none"> 1) Minimize exposure to heat and blowing fire embers e) Park near the structure <ul style="list-style-type: none"> 1) Hoselines can be kept short f) Keep cab doors closed g) Keep windows rolled up h) Place engine's air-conditioning system in recirculation mode <ul style="list-style-type: none"> 1) Avoid drawing in smoke i) Do not park next to or under hazards <ul style="list-style-type: none"> 1) Power lines 2) Trees or snags 3) LPG tanks or other pressure vessels 4) Structures that might burn <p>D. Making an attack</p> <ul style="list-style-type: none"> 1. Expected to operate from a variety of positions during the course of the attack 2. Never place the apparatus or crew in peril 3. Provide maximum protection from heat, fire, and other hazards <ul style="list-style-type: none"> a) Falling trees b) Rolling rocks c) Incoming air drops d) Heavy equipment operating in the area 	

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>4. Procedures</p> <ul style="list-style-type: none"> a) Park in a safety zone b) Never leave unattended c) Leave headlights on when engine is running d) Back into one-way roads and driveways <ul style="list-style-type: none"> 1) Facing the escape route e) Keep windows rolled up f) Park in burned fuels <ul style="list-style-type: none"> 1) Do not park in unburned fuels higher than the bumper or running board without a spotter g) Avoid steep hillsides <ul style="list-style-type: none"> 1) Can slide or overturn h) Do not park on a saddle or at the top of a chimney <p>III. POSITIONING FOR RESCUE</p> <ul style="list-style-type: none"> A. Generally, not as critical as pumping and aerial apparatus B. Park as close to the scene as possible <ul style="list-style-type: none"> 1. Do not block access to other apparatus C. Keep a clear exit path from the scene <ul style="list-style-type: none"> 1. If needed at a second incident D. Use the vehicle as a barrier to oncoming traffic <ul style="list-style-type: none"> 1. If incident is in one or more lanes, park apparatus so those lanes are blocked and no more 2. Place apparatus between oncoming traffic and the incident 	<p>What if the incident is in the street?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> a) If apparatus is hit, it has farther to travel before striking rescuers b) Close enough so traffic cannot come around apparatus and strike rescuers 3. Turn wheels to direct the apparatus from the scene if hit <ul style="list-style-type: none"> a) Engine (motor) noise is reduced b) Exhaust fumes lessened E. In some cases, the apparatus may be left, but only if the following are applied <ul style="list-style-type: none"> 1. Parking or maxi brake applied 2. Front wheels turned toward curb or barrier 3. Chock block, if department policy 4. With all rear warning lights on 	<p>In what condition is the apparatus left when parked?</p>



FIRE FIGHTER II

SUMMARY:

Proper placement of fire engines cannot only help an operation, but also handle it. It is up to the driver/operator to make this placement a credit rather than a debit to the emergency scene.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Pumping Apparatus Driver/Operator, IFSTA, First Edition, Chapter 5 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: HOW TO MAKE AN INTAKE PUMP CONNECTION USING A 2½" HOSELINE

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-3.2

BEHAVIORAL OBJECTIVE:

Condition: A fire engine equipped with sufficient 2½" hoseline, spanner wrench, and appropriate personal protective equipment

Behavior: The student will connect a 2½" supply line to the pump inlet

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- Fire engine equipped with 2½" hoseline
- Spanner wrench
- Appropriate personal protective equipment

REFERENCES:

- Essentials of Fire Fighting, IFSTA, Fourth Edition, Chapter 12
- Hose Practices, IFSTA, Seventh Edition, Chapter 4

PREPARATION:

On routine fires, it is good practice to lay a hoseline in from the nearest hydrant. When this is done, it is important to make the pump connection and open the hydrant before the engine tank supply is gone. This simple job is very important as an uninterrupted supply of water must be maintained.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Remove auxiliary pump inlet cap	1a. Turning counterclockwise
2. Place pump inlet cap	b. Using spanner wrench, if necessary
3. Remove 2½" hoseline	2a. On running board
	3a. From hose bed
	b. Toward direction of travel when pulling line
	c. Sufficient amount to reach pump inlet connection
4. Break coupling	4a. Foot tilt method on threaded couplings
5. Place unused hoseline	5a. Back into hose bed
6. Advance and attach hoseline	6a. To pump inlet
	b. Hand tight



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO MAKE AN INTAKE PUMP CONNECTION USING LARGE DIAMETER HOSE

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-3.2

BEHAVIORAL OBJECTIVE:

Condition: A fire engine equipped with large diameter hose, rubber mallet or spanner wrench, and appropriate personal protective equipment

Behavior: The student will connect a large diameter hose to the pump inlet

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- Fire engine equipped with large diameter hose
- Rubber mallet or spanner wrench
- Appropriate personal protective equipment

REFERENCES:

- Hose Practices, IFSTA, Seventh Edition, Chapter 7

PREPARATION:

When large volumes of water are needed, it mandates larger hoselines to be laid. While 2½" hoselines can be adequate for fires in dwellings, fires in larger buildings as well as master stream devices require the large diameter hose be laid.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Remove pump inlet cap	1a. Turning counterclockwise
	b. Using rubber mallet or spanner wrench
2. Place pump inlet cap	2a. On running board
3. Remove large diameter hose (LDH)	3a. From hose bed
	b. Toward direction of travel when pulling line
	c. Sufficient amount to reach pump inlet connection
4. Break coupling	4a. Foot tilt method on threaded couplings
5. Place unused hose	5a. Back into hose bed
6. Advance and attach hose	6a. To pump inlet
	b. Spanner tight



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO MAKE A FOUR-WAY HYDRANT VALVE CONNECTION

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-3.2

BEHAVIORAL OBJECTIVE:

Condition: A fire engine equipped with a four-way hydrant valve, hydrant, hydrant wrench, appropriate hoseline with attached nozzle, and appropriate personal protective equipment

Behavior: The student will connect a four-way hydrant valve to a hydrant and supply an engine with water at hydrant pressure

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- Fire engine with a four-way hydrant valve
- Hydrant
- Hydrant wrench
- Appropriate hoseline with attached nozzle
- Appropriate personal protective equipment

REFERENCES:

- Essentials of Fire Fighting, IFSTA, Fourth Edition, Chapter 12

PREPARATION:

A four-way hydrant valve allows a forward laid supply line to be immediately charged and allows a later-arriving pumper to connect to the hydrant. The second pumper can then supply lines and/or boost the pressure to the original line. Typically, the four-way hydrant valve is preconnected to the end of the supply line. This allows the fire fighter who is catching the hydrant to hook the valve and the hoseline to the hydrant in one action.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Remove four-way hydrant valve, hydrant wrench, and hoseline	1a. From engine b. Four-way hydrant valve preconnected to hoseline c. Lifting properly
2. Carry valve, wrench, and hoseline	2a. To hydrant b. Sufficient amount of hoseline for task
3. Anchor hoseline	3a. To hydrant
4. Place hydrant wrench	4a. On outlet cap to be removed
5. Signal engine	5a. To proceed b. For forward hose lay
6. Remove cap	6a. From outlet b. Counterclockwise c. Allowing to hang free
7. Place hydrant wrench	7a. On operating stem of outlet
8. Open hydrant outlet	8a. To open and flush outlet of potential debris b. Turning operating stem counterclockwise c. Approximately one complete turn
9. Close hydrant outlet	9a. Turning operating stem clockwise
10. Unwrap hoseline	10a. From around hydrant
11. Couple valve	11a. To outlet b. Rotating swivel clockwise c. Hand tight

FIRE FIGHTER II

OPERATIONS	KEY POINTS
12. Check position	12a. Of valve control b. To ensure proper position for water flow to preconnected hoseline
13. Await signal	13a. From pump operator b. When pumper at scene is ready for water c. Before opening hydrant outlet
14. Open hydrant outlet	14a. At signal b. Turning operating stem counterclockwise c. Slowly and completely d. Ensuring water flowing correctly through valve
15. Return to apparatus	15a. Removing kinks b. Tightening leaking couplings c. Pushing hoseline d. Toward curb



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: PROCEDURES FOR TESTING FIRE HOSE

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 3-5.4 and SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the procedures for testing fire hose by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Essentials of Fire Fighting, IFSTA, Fourth Edition, Chapter 12

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Essentials of Fire Fighting, IFSTA, Fourth Edition
- Essentials of Fire Fighting, Fire Fighter II Student Applications, IFSTA, Fourth Edition, Job Sheet 12-7
- Firefighter's Handbook, Delmar, 2000 Edition
- Hose Practices, IFSTA, Seventh Edition

PREPARATION:

The task of testing hose can be tedious and long. It is not good practice to take shortcuts to try to make the task go faster. All safety precautions and procedures must be followed. Hose testing is one of the most important tasks in the fire service. Your life may depend on hose that has been properly tested.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. TYPES OF TESTS</p> <p>A. Acceptance test</p> <ol style="list-style-type: none"> 1. New hose only subject to this test 2. Conducted at point of manufacture 3. At a properly equipped facility 4. When delivered to purchaser <p>B. Service test</p> <ol style="list-style-type: none"> 1. To remain in service, hose shall pass the service test 2. Select proper service test for each type of hose <p>II. SERVICE TEST FOR FIRE HOSE</p> <p>A. Frequency</p> <ol style="list-style-type: none"> 1. Conduct annually 2. After each use 3. If frozen <p>B. Inspect after new or used couplings have been attached</p> <ol style="list-style-type: none"> 1. Jacket defects 2. Coupling 3. Worn or defective gaskets 4. If problems, remove from service and repair <ol style="list-style-type: none"> a) Retest <p>C. Test pressures</p> <ol style="list-style-type: none"> 1. Various pressures depending on type or size of hoseline 	<p>What are the two types of hose tests used in the fire service?</p> <p>How often is fire hose tested?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>D. Remove air from hoseline</p> <ol style="list-style-type: none"> 1. Open test gate valve and the nozzle of test cap valve 2. Gradually raise pressure to 50 psi 3. When hoseline charged and <u>all</u> air removed <ol style="list-style-type: none"> a) Close nozzle or cap valve b) Close test gate valve <ol style="list-style-type: none"> 1) Not completely 4. Problems or safety issues if all air is not removed <ol style="list-style-type: none"> a) Difficult to remove air from longer lengths of hoseline b) Water hammer <p>E. Marking for coupling slippage</p> <ol style="list-style-type: none"> 1. After filling hoseline 2. Mark each coupling at the back of coupling <ol style="list-style-type: none"> a) Use #2 pencil 3. Check out all couplings for leakage <p>F. Pressure test</p> <ol style="list-style-type: none"> 1. Appropriate PPE should be worn 2. Raise pressure slowly to specified service test pressure 3. Pressure held for five minutes 	<p>What problems or safety issues may present if not all air is removed?</p> <p>How do you determine whether the coupling slips?</p> <p>How long is test pressure held?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>4. Inspect line for leaks</p> <ol style="list-style-type: none"> a) Never straddle line b) Stay to the left side of line <p>G. Draining</p> <ol style="list-style-type: none"> 1. After five minutes, slowly reduce pressure <ol style="list-style-type: none"> a) Close pump discharge gate b) Open nozzle or test cap valve <p>H. Safety considerations</p> <ol style="list-style-type: none"> 1. Procedures must be followed for safety 2. Use care in removing all air from hoseline 3. All 3½" or larger hoseline to be tested while lying flat <p>I. Recording data</p> <ol style="list-style-type: none"> 1. Update hose records 2. If hose defective, provide tag explaining defect 3. Mark location of defect 4. Observe marks placed in back of couplings <p>J. After completing test</p> <ol style="list-style-type: none"> 1. Clean hose thoroughly 2. Drain and dry 3. Place back in service <p>IV. UNLINED HOSE</p> <p>A. Similar to test used for lined hose</p>	<p>How is the pressure reduced?</p> <p>How is test data recorded?</p> <p>Is the same test used for unlined hose?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>B. Exceptions</p> <ol style="list-style-type: none"> 1. Ten minute wet-soak at 50 psi 2. Maximum flow rate of 20 gpm 3. Thoroughly dry hoseline immediately <p>V. HARD SUCTION HOSE</p> <p>A. Tested annually to 150% of the rated working pressure</p> <p>B. Also dry vacuum tested</p> <ol style="list-style-type: none"> 1. Attach to a suction source 2. Free end shall be sealed with transparent disk 3. Develop 22 inches of vacuum 4. Inspect lining of hose <ol style="list-style-type: none"> a) No collapsing of lining into waterway 	<p>How is lining of hard suction hose tested?</p>



FIRE FIGHTER II

SUMMARY:

All fire hose of the types described in NFPA Standard #1962 shall be service tested at intervals specified in the respective chapters. To remain in service, the hose shall pass the service test for that type of hose. The procedures in this lesson plan should be followed carefully. Testing hose is dangerous and should be conducted by trained and qualified personnel.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Essentials of Fire Fighting, IFSTA, Fourth Edition, Chapter 12 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: PROCEDURES FOR MAINTAINING HOSE RECORDS

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-5.3

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the procedures for maintaining hose records by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Hose Practices, IFSTA, Seventh Edition, Chapter 2

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Hose Practices, IFSTA, Seventh Edition
- NFPA Standard #1962, NFPA, 1998 Edition

PREPARATION:

Accurate hose records are necessary in the fire service. The information is needed to maintain safety and to gain replacement of hoseline when needed. In addition, when ISO establishes the fire insurance rating for your community, hose records are among the criteria they use to assess a fire department's operational readiness.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. ACCURATE HOSE RECORDS SHALL BE ESTABLISHED AND MAINTAINED</p> <p>A. Established upon delivery and acceptance</p> <p>B. Recorded in books, on cards, or by computer</p> <p>C. Records centrally located</p> <ol style="list-style-type: none"> 1. At station level 2. Maintained by a designated hose "officer" <p>D. Wildland/forestry hoseline</p> <ol style="list-style-type: none"> 1. Different standard for record keeping compared to fire department hoseline 2. AHJ shall determine the records necessary to achieve an effective hose management program <p>E. Out-of-service hoseline</p> <ol style="list-style-type: none"> 1. Properly tagged <ol style="list-style-type: none"> a) Reason hoseline was removed from service b) Location of damage to hoseline 	<p>When should hose records be established?</p> <p>Where should hose records be stored?</p> <p>What must the AHJ determine regarding record keeping of wildland/forestry hose?</p> <p>What should be done with out-of-service hoseline?</p> <p>What information should be placed on an out-of-service tag?</p>

PRESENTATION	APPLICATION
<p>2. Determine if out-of-service hoseline is within warranty period</p> <p>II. REQUIRED INFORMATION FOR HOSE RECORDS</p> <ul style="list-style-type: none"> A. Assigned identification number B. Manufacturer and part number C. Vendor D. Size <ul style="list-style-type: none"> 1. Internal diameter waterway E. Length F. Type of hoseline <ul style="list-style-type: none"> 1. Single or double jacket G. Construction <ul style="list-style-type: none"> 1. Synthetic, cotton H. Date received and put in service <p>III. IN-USE INFORMATION</p> <ul style="list-style-type: none"> A. Date of each service test B. Service test pressure C. Repairs made <ul style="list-style-type: none"> 1. New length D. Actual damage 	<p>If newer hoseline is placed out-of-service, what information from the hose record should be checked?</p> <p>What information is required for new hose acceptance?</p> <p>What information is required for hoseline in use?</p>

PRESENTATION	APPLICATION
<p>E. If exposed to possible damage</p> <p>F. Reason removed from service</p> <p>G. Reason if condemned</p> <p>IV. RESPONSIBILITY</p> <p>A. Authority having jurisdiction</p> <p>B. Hoseline repair and maintenance personnel responsible to ensure work on hoseline is recorded</p> <p>V. IDENTIFICATION METHODS FOR HOSE SECTIONS</p> <p>A. Die stamp identification number and fire department initials on coupling</p> <p>B. Stencil identification number and fire department initials on hose jacket near each end using indelible ink</p> <p>C. Color-code coupling shank, swivel or lugs indicating apparatus or fire station of hose assignment</p>	<p>Whose responsibility is it to get the repairs recorded?</p> <p>What are three different methods for identifying hose sections?</p>



FIRE FIGHTER II

SUMMARY:

Whether hoseline is new or has been in service for several years, maintaining accurate hose records is essential. Upon delivery and acceptance, each section of hoseline is assigned an identification number for use in recording its history throughout its service life. Records are kept in books, on cards, or by computer as specified by the authority that has jurisdiction. Complete data on testing and repairs is always recorded

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Hose Practices, IFSTA, Seventh Edition, Chapter 2 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: ELECTRICAL EMERGENCIES

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-4.2

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of electrical emergencies by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Fire Service Rescue, IFSTA, Sixth Edition, Chapter 11

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Fire Service Rescue, IFSTA, Sixth Edition
- Firefighter's Handbook, Delmar, 2000 Edition

PREPARATION:

Electricity is a real threat to fire fighters and a basic understanding of this threat can aid in preventing injuries and death. This knowledge can also assist the fire fighters in aiding persons injured by electricity.

PRESENTATION	APPLICATION
<p>I. ELECTRICAL SUPPLY SYSTEM</p> <p>A. Five major components</p> <ol style="list-style-type: none"> 1. Generating facilities 2. Transmission lines 3. Substations 4. Distribution lines 5. Service connections to customers <ol style="list-style-type: none"> a) Homes and businesses <p>II. GENERATING STATIONS</p> <p>A. Facilities where electrical power is generated</p> <p>B. Usually well staffed, well run, and well maintained</p> <ol style="list-style-type: none"> 1. Emergency situations are very infrequent <p>C. Examples</p> <ol style="list-style-type: none"> 1. Hydro-electric dams 2. Oil- or coal-fired boiler installations 3. Nuclear power plants <p>D. Common emergency situations</p> <ol style="list-style-type: none"> 1. Steam injuries 2. Electrocution 3. Falls from heights 4. Radiation issues <p>III. TRANSMISSION/DISTRIBUTION LINES</p> <p>A. Also known as "high tension lines" or "trunk lines"</p> <p>B. Used to carry the electricity produced at generating stations to various substations</p> <p>C. Transmission voltage can be 330,000 volts or higher</p>	<p>In what locations would you expect to find electrical hazards?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>D. Assume all downed power lines are energized</p> <p>E. Fallen lines can start fires</p> <ol style="list-style-type: none"> 1. Do not attack a fire started by a downed power line until it is at least a distance equal to one span between towers away from the downed line <p>F. Common emergency situations</p> <ol style="list-style-type: none"> 1. Unauthorized people climb the towers and cannot get down without assistance <ol style="list-style-type: none"> a) Most common 2. Lines fall 3. Towers collapse <ol style="list-style-type: none"> a) May be damaged if struck by a fast-moving vehicle or heavy metal crane <p>IV. SUBSTATIONS</p> <p>A. Located at various points along the electrical system</p> <p>B. Use transformers to either step the voltage up or down</p> <ol style="list-style-type: none"> 1. Step up voltage from the generating station for input into the transmission system 2. Step down voltage from the transmission lines down to levels that are appropriate for local distribution lines 	<p>Should you assume that all power lines are energized or will circuit breakers automatically cut the power?</p> <p>Can you guess what is the most common emergency regarding high voltage towers?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>C. Although decreasing in number, transformers with the known carcinogen polychlorinated biphenyls (PCBs) may be present</p> <ol style="list-style-type: none"> 1. Remote possibility <p>D. <u>Never</u> enter an underground utility space without the assistance of utility personnel</p> <p>E. Avoid using metal tools</p> <p>V. DISTRIBUTION LINES</p> <p>A. Also know as "primaries"</p> <p>B. Transmission voltage generally much lower than transmission lines</p> <ol style="list-style-type: none"> 1. 2,400-34,000 volts <p>C. Mid-range transmission voltages are stepped down by pole-mounted transformers for consumer use</p> <ol style="list-style-type: none"> 1. 120-440 volts <p>D. Common emergency situations</p> <ol style="list-style-type: none"> 1. Utility personnel or others coming in contact with these lines aloft or on the ground <p>VI. SERVICE CONNECTIONS</p> <p>A. Connections made from distribution lines to consumers either underground or on poles</p> <p>B. Common emergency situations</p> <ol style="list-style-type: none"> 1. Accidents during excavation 2. Injuries occur when someone or something comes in contact with the drop from the pole or the meter connection <ol style="list-style-type: none"> a) Most common 	<p>When is it OK to enter an underground utility space?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>VII. GENERAL ELECTRICAL SAFETY CONSIDERATIONS</p> <p>A. When responding to any situation involving electricity, <u>always</u></p> <ol style="list-style-type: none"> 1. Assume that electrical lines or equipment is energized 2. Call for the power provider to respond 3. Control the scene <p>B. As a guideline, avoid using metal tools within 10 feet</p> <p>C. Dielectric equipment, such as lineperson's gloves and wire cutters, may be used if properly maintained and tested regularly</p> <p>D. If necessary to cut a wire on a victim, cut the wire on both sides to prevent back feeding</p> <p>E. Be cognizant of wire recoil when cutting a wire</p> <p>F. Shut-off power to homes or businesses using the individual circuit breakers first</p> <ol style="list-style-type: none"> 1. The main electrical disconnect is used last <p>G. Standard fire service pike poles with wooden or fiberglass handles are not dielectric equipment and should never be used to move energized electrical wires</p> <p>H. Objects near downed lines may be energized</p> <p>I. Ground gradient can extend several feet away from where the wire contacts the ground</p> <ol style="list-style-type: none"> 1. Rescuers may be electrocuted by simply walking too close to a downed electrical line because of differences in ground gradient <p>J. Underground utility spaces may require confined space entry protocols to be followed</p> <p>K. <u>Never</u> enter an underground utility space without the assistance of utility personnel</p>	



FIRE FIGHTER II

SUMMARY:

Electrical emergencies are dangerous and knowledge of what to expect can help to prevent fire fighter injuries and deaths. Electrical emergencies can be found at generating stations, distribution station, vehicle accident rescue, or any rescue involving electrical equipment. The fire fighter should always assume that electrical circuits are energized and take appropriate action. In general, power company personnel should be the ultimate technical reference and safety officers.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Service Rescue, IFSTA, Sixth Edition, Chapter 11 in order to prepare yourself for the upcoming test. Study for our next session

TOPIC: ESCALATOR EMERGENCIES

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-4.2

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of escalator rescue by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Essentials of Fire Fighting, IFSTA, Fourth Edition, Chapter 7

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Essentials of Fire Fighting, IFSTA, Fourth Edition
- Firefighter's Handbook, Delmar, 2000 Edition

PREPARATION:

Though escalator rescues are uncommon, it is important that you understand the hazards associated with escalators and the rescue techniques available to you. Your actions may determine the outcome of these emergencies.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>2. May be under handrail</p> <p>B. Passenger with feet/hands caught</p> <p>1. Usually in comb</p> <p>2. May be under handrail</p> <p>C. Technician caught in gears/chain or track mechanism</p> <p>III. RESCUE CONSIDERATIONS</p> <p>A. Control electrical source</p> <p>1. Lockout/tagout procedures</p> <p>B. Landing plates can be raised to access drive mechanism</p> <p>C. Very difficult to reverse direction of escalator</p> <p>D. May be possible to loosen handrail</p> <p>1. Mechanism is usually near gear motor</p> <p>E. If life-threatening</p> <p>1. Conventional forcible entry/extrication equipment may be needed</p> <p>F. If not life-threatening</p> <p>1. Usually best to wait for repair technician</p>	<p>What is the safest way to control the electrical source?</p> <p>How can the drive mechanism be accessed?</p>



FIRE FIGHTER II

SUMMARY:

A basic knowledge of escalator components and types of emergencies, coupled with information on rescue options should provide for a safe and efficient resolution to escalator emergencies.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Essentials of Fire Fighting, IFSTA, Fourth Edition, Chapter 7 in order to prepare yourself for the upcoming test. Study for our next session.

FIRE FIGHTER II

TOPIC: COMPONENTS OF ELEVATORS

TIME FRAME: 0:45

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-4.2

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the components of an elevator by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Fire Service Rescue, IFSTA, Sixth Edition, Chapter 7

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Essentials of Fire Fighting, IFSTA, Fourth Edition
- Fire Service Rescue, IFSTA, Sixth Edition
- Firefighter's Handbook, Delmar, 2000 Edition

PREPARATION:

In order to maintain fire fighter safety when working around elevators, there must be an awareness of the components and working features of an elevator. Without this information, a fire fighter may place himself or herself in a lethal position.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. TYPES OF ELEVATORS</p> <p>A. Electric</p> <ol style="list-style-type: none"> 1. Drum <ol style="list-style-type: none"> a) System uses a large drum and hoisting cable to move elevator b) Found in very old structures c) May still be used as freight elevators 2. Traction <ol style="list-style-type: none"> a) System uses geared motor/sheave, cables, counterweight and idler sheave to move elevator <p>B. Hydraulic</p> <ol style="list-style-type: none"> 1. System uses motor/hydraulic pump, reservoir, piping, and multi-stage piston to move elevator <p>C. Similarities</p> <ol style="list-style-type: none"> 1. Components in lobby and interior of car identical for both types <p>D. Differences</p> <ol style="list-style-type: none"> 1. Components in hoistway and machine room may differ <p>II. CORRIDOR OR LOBBY</p> <p>A. Lobby is normally located on the first floor, but not always</p> <p>B. Hall position indicator</p> <ol style="list-style-type: none"> 1. Indicates location and direction of travel <p>C. Hall call button</p> <ol style="list-style-type: none"> 1. Found on each floor 2. Push to call elevator to that floor 	<p>Where is the main lobby normally located?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>D. Fire department service</p> <ol style="list-style-type: none"> 1. Located in main lobby 2. Allows fire department personnel to gain manual control of that elevator 3. Immediately calls car down nonstop to lobby 4. Key operated <p>E. By-pass switch</p> <ol style="list-style-type: none"> 1. Position on fire department service switch 2. Cars on that bank are automatically sent nonstop to the lobby <ol style="list-style-type: none"> a) Will not respond to lobby if activated detector is in lobby b) Turn to by-pass to return to normal position <p>F. Basic types of elevator doors</p> <ol style="list-style-type: none"> 1. Center opening doors <ol style="list-style-type: none"> a) Doors open from center at same speed 2. Two-speed doors <ol style="list-style-type: none"> a) Geared together b) One door moves twice as fast as the other 3. Single slide door <ol style="list-style-type: none"> a) Single panel door slides open and closed 4. Swing hall door <ol style="list-style-type: none"> a) Open manually 	<p>What happens when a smoke or heat detector in an elevator shaft or lobby is activated?</p> <p>What are the types of elevator doors?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>E. Emergency exits</p> <ol style="list-style-type: none"> 1. Top 2. Side <p>F. Certification tag</p> <ol style="list-style-type: none"> 1. Type of elevator 2. Manufacturer's name 3. Load capacity of car in pounds and occupant load <p>G. Car position indicator</p> <ol style="list-style-type: none"> 1. Also indicates direction of travel <p>H. Car operating panel</p> <ol style="list-style-type: none"> 1. Floor selection buttons 2. Door open button 3. Emergency stop switch 4. Alarm button 5. Door close button 6. Fire department service 7. Independent service 	<p>What are some features found on the opening panel?</p>
<p>IV. HOISTWAY</p> <p>A. Also called shaft</p> <p>B. Components (geared traction)</p> <ol style="list-style-type: none"> 1. Guide rails 2. Roller guides 3. Travel cables 4. Emergency stop switch 	<p>Can anyone name the components of the hoistway?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 5. Dampening springs 6. Door mechanisms C. Components (hydraulic) <ul style="list-style-type: none"> 1. Guide rails 2. Roller guides 3. Emergency stop switch 4. Hoist piston/cylinder 5. Dampening springs 6. Door mechanisms V. MACHINE ROOM <ul style="list-style-type: none"> A. Components (geared traction) <ul style="list-style-type: none"> 1. Hoist motor sheave 2. Idler sheave 3. Traction brake 4. Cables 5. Selector 6. Governor 7. Controller B. Components (hydraulic) <ul style="list-style-type: none"> 1. Hydraulic motor/pump 2. Fluid reservoir 3. Piping 4. Emergency lowering valve 5. Selector 6. Controller 	<p>What components are found in the machine room?</p>



FIRE FIGHTER II

SUMMARY:

There are four basic areas that must be dealt with on elevator operations: lobby, interior of the car, hoistway, and machine room. Each individual area of an elevator presents special features that the fire fighter should be aware.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Service Rescue, IFSTA, Sixth Edition, Chapter 7 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: ELEVATOR SAFETY AWARENESS

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-4.2

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the principles of elevator safety by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Fire Service Rescue, IFSTA, Sixth Edition, Chapter 7

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Fire Service Rescue, IFSTA, Sixth Edition

PREPARATION:

To ensure the safe completion of any operation, everyone must know what they are supposed to do. Unforeseen things can change the plan, but certain procedures must always be done. Remember, it is hard to "recall from free fall."

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. SCENE MANAGEMENT</p> <p>A. Determine if emergency or nonemergency exists</p> <ol style="list-style-type: none"> 1. If passenger or victim is injured, pinned, or endangered, an emergency exists 2. 99% of elevator incidents are nonemergency <ol style="list-style-type: none"> a) Passengers should stay in car in nonemergency situations b) If nonemergency exists, then the danger of a rescue attempt to passengers and rescuers outweighs the potential gains <p>B. Obtain as much information about the elevator as possible</p> <ol style="list-style-type: none"> 1. Access pre-incident plan 2. Building management or maintenance supervisor 3. Past history of problems <p>C. Contact the elevator company which has the service contract</p> <ol style="list-style-type: none"> 1. Usually on call 24-hours a day 2. Telephone number may be found in elevator or in machine room <p>D. Establish communications with passengers</p> <ol style="list-style-type: none"> 1. Elevator phone/intercom 2. Verbal (shouting) 3. Identify self and assure passengers of their safety 	<p>Where can the company telephone number be found?</p> <p>How are you going to communicate with passengers?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>4. Determine status of passengers</p> <ol style="list-style-type: none"> a) Numbers b) Physical and mental condition) <p>5. Instruct passengers not to not panic or touch controls without specific instructions</p> <p>E. Determine location of elevator car</p> <ol style="list-style-type: none"> 1. Shut-off main disconnect first 2. Check hall position indicator 3. Ask passengers to tell you the floor number indicated on car panel (if lit) 4. Use other elevator, if available, and check with light 5. Open hoistway door and shine light up and down shaft <p>F. Emergency situations</p> <ol style="list-style-type: none"> 1. Remember.... NO ACTION SHOULD BE TAKEN UNTIL THE MAIN POWER SWITCH IS OFF! 2. Fire fighters can be sent to floors above and below stalled elevator <ol style="list-style-type: none"> a) Push call button in an attempt to recall elevator 3. Shaking the inner doors may cause them to open 	<p>What methods can help determine location of elevator car?</p> <p>Before any rescue action is taken, what must be done first?</p>



FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none">4. Do not try to open doors with pry bar or hydraulic spreading tool5. Do not use a cutting torch	



FIRE FIGHTER II

SUMMARY:

Most elevator emergencies are not life threatening and speed is not critical. Simply establishing the location of the elevator and communicating with the victim may be all that is required of you. Do not attempt any rescue until the power source is controlled.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Service Rescue, IFSTA, Sixth Edition, Chapter 7 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC:	PROCEDURES FOR ELEVATOR EXTRICATION
TIME FRAME:	0:30
LEVEL OF INSTRUCTION:	Level II
AUTHORITY:	1997 NFPA 1001 4-4.2
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of the procedures for elevator extrication by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Fire Service Rescue</u> , IFSTA, Sixth Edition, Chapter 7
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials
REFERENCES:	<ul style="list-style-type: none">• <u>Fire Service Rescue</u>, IFSTA, Sixth Edition
PREPARATION:	Rescue and removal of trapped victims from elevators can be performed safely. To do so, fire fighters must understand the operation of elevator doors and emergency exits.

PRESENTATION	APPLICATION
<p>I. GENERAL EXTRICATION PROCEDURES</p> <p>A. Contact elevator representative</p> <p>B. Reassure victims and passengers that they will be rescued</p> <ol style="list-style-type: none"> 1. Elevator car telephone 2. Talk through elevator door <p>C. Exits to elevator cars</p> <ol style="list-style-type: none"> 1. Top exit 2. Side exit 3. Front exit <p>II. REMOVAL OF VICTIMS VIA TOP EXIT</p> <p>A. Disconnect power to elevator car</p> <ol style="list-style-type: none"> 1. Usually located in machine room 2. Use lockout/tag out procedures <ol style="list-style-type: none"> a) To prevent accidental energizing of equipment b) Leave a fire fighter with a radio at the panel, if possible <p>B. Block open hoistway door</p> <p>C. Access top of elevator car</p> <ol style="list-style-type: none"> 1. Open top exit door 2. Remove false ceiling and light bulbs 3. Enter elevator car using an attic ladder 4. Assess condition of victims 	<p>What are two ways to communicate with trapped victims?</p> <p>What are examples of elevator exits?</p> <p>Why use lockout/tag out procedures?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>D. Attempt to restore elevator car operations</p> <ol style="list-style-type: none"> 1. Shake elevator car doors 2. Slide piece of cardboard between car doors to activate photoelectric cell and open door if car is at a floor loading <p>E. Position ladders inside and on top of elevator car for exit</p> <ol style="list-style-type: none"> 1. Secure ladder for safety 2. Assist victims to safety 3. Secure hoistway door after removal of victims <p>III. REMOVAL OF VICTIMS VIA SIDE EXIT</p> <p>A. Disconnect power supply to stalled elevator car</p> <ol style="list-style-type: none"> 1. Use lockout/tag out procedures <p>B. Place adjacent in-service elevator car on independent or emergency service operation</p> <ol style="list-style-type: none"> 1. Locate stalled elevator car 2. Align in-service elevator car with stalled elevator car, side exit 3. Apply emergency stop or inspection switch 4. Disconnect main power to in-service elevator <ol style="list-style-type: none"> a) Use lockout/tag out procedures 5. Open side emergency exits on both cars 6. Enter stalled car and assist transfer of victims from stalled car to in-service car 	<p>What is the first step before removing victims via side exit?</p>

PRESENTATION	APPLICATION
<p>IV. REMOVAL OF VICTIMS VIA FRONT ACCESS WITH ELEVATOR SUSPENDED ABOVE FLOOR</p> <ul style="list-style-type: none"> A. Access hoistway door B. Disconnect power to elevator car <ul style="list-style-type: none"> 1. Use lockout/tag out procedures C. Insert ladder into elevator <ul style="list-style-type: none"> 1. If shaft exposure exceeds 2 feet, secure opening to elevator shaft to ensure safety of victims and rescue personnel from entering elevator shaft D. Assist victims to safety <p>V. REMOVAL OF VICTIMS VIA FRONT ACCESS WITH ELEVATOR SUSPENDED BELOW FLOOR</p> <ul style="list-style-type: none"> A. Access hoistway door B. Disconnect power to elevator C. Insert ladder into elevator car D. Assist victims to safety 	<p>Why is it important to secure elevator shaft?</p>



FIRE FIGHTER II

SUMMARY:

It is important to recognize the component of elevator exits and rescue options in order to facilitate efficient and timely extrication procedures. Exits are provided on elevator cars on the top, side, or front. If an elevator car is between floors, you may have to use ladders or other elevator cars to effect the rescue.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Service Rescue, IFSTA, Sixth Edition, Chapter 7 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: PROCEDURES FOR CONVERTING AN ELEVATOR FROM INDEPENDENT TO EMERGENCY SERVICE

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the procedures to convert an elevator from independent to emergency service by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in Fire Service Rescue, IFSTA, Sixth Edition, Chapter 7

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Fire Service Rescue, IFSTA, Sixth Edition

PREPARATION: When combating fires in high-rise buildings, one of the first questions that come to mind is "Do you use the elevator?" The answer is no doubt "Yes." The elevator is an essential tool in any building four or more stories in height, especially if aerial equipment cannot be used fully on all sides of the building. Studies have shown that even the most physically fit fire fighters carrying necessary fire fighting equipment cannot move up more than seven flights of stairs without resting before going to work.

It is seriously recommended that fire/rescue personnel survey the elevators within their jurisdictions to determine which buildings have fire department elevators and how they operate.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>NOTE: The steps listed in this lesson plan are not necessarily applicable to all applications. How this feature operates will depend largely on when it was installed and the job requirements.</p> <p>I. PROCEDURES</p> <p>A. Operate key-activated switch</p> <ol style="list-style-type: none"> 1. Usually located on wall outside the elevator 2. Elevator will return, nonstop, to the lobby 3. Remove key and insert into similar switch inside the elevator car <p>B. Turn key to the "ON" position</p> <ol style="list-style-type: none"> 1. Gives the operator sole control 2. May be toggle switch located behind locked panel instead of key control <p>C. Elevator car movement</p> <ol style="list-style-type: none"> 1. Push button for desired floor 2. Press and hold "DOOR OPEN" button until door closes completely 3. Elevator will move to desired floor 4. Press and hold "DOOR OPEN" button until door opens completely 5. Elevator can be returned at any time by pressing "CALL CANCEL" button 6. Bypass the electric cell so smoke will not keep the doors open 	<p>What should be done before the car starts to move?</p>

**SUMMARY:**

To ensure a safe and quick conversion from independent service to emergency service, set procedures must be followed. Different elevator manufacturers use different methods of car control. It is vital for you to know the elevators in your jurisdiction.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Service Rescue, IFSTA, Sixth Edition, Chapter 7 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: INDUSTRIAL ACCIDENTS

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level I

AUTHORITY: 1997 NFPA 1001 4-4.2

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of industrial accidents by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Essentials of Fire Fighting, IFSTA, Fourth Edition, Chapter 7

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Essentials of Fire Fighting, IFSTA, Fourth Edition
- Firefighter's Handbook, Delmar, 2000 Edition

PREPARATION:

Industrial accidents occur frequently and the injuries are as varied as the equipment involved in industry. Specific methods to cover all possible incidents are not within the scope of this lesson. This session will provide you with general entrapment knowledge that will help when responding to an industrial accident.

PRESENTATION	APPLICATION
<p>I. INDUSTRIAL ENTRAPMENT ASSESSMENT</p> <ul style="list-style-type: none"> A. Apparent extent of injuries B. Hazards anticipated to the victim and rescuers C. Disentanglement requirements D. Support needs <ul style="list-style-type: none"> 1. Additional medical units 2. Specialized extrication equipment 3. Advanced medical assistance 4. Hazardous materials team 5. Machinery manufacturer/technical specialists <p>II. ORDER OF PROCEDURES</p> <ul style="list-style-type: none"> A. Assess the incident (size-up) B. Identify on-scene experts for the involved machinery C. Stabilize the involved machinery D. Assessment and treatment of the patient E. Disentanglement of the patient F. Transport the patient to the most appropriate facility <p>III. DISENTANGLEMENT PROCESS</p> <ul style="list-style-type: none"> A. Begins with shutting down the power <ul style="list-style-type: none"> 1. Determine what effect shutting down the machinery will have on the machine 2. In some processes shutting off the power will cause the machine to finish its cycle <ul style="list-style-type: none"> a) Possibly causing further injury 	<p>What should be the first step in the disentanglement process?</p>



FIRE FIGHTER II

SUMMARY:

Industrial entrapment incidents may be very delicate calls. They require an adequate size up to discover the best method to extricate the victim. The knowledge of on-scene employees will be of extreme help to the rescue personnel.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Essentials of Fire Fighting, IFSTA, Fourth Edition, Chapter 7 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: CAVE, TUNNEL, AND MINE RESCUE AWARENESS

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level I

AUTHORITY: 1997 NFPA 1001 4-4.2

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of cave, tunnel, and mine rescue by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Fire Service Rescue, IFSTA, Sixth Edition, Chapter 11

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Fire Service Rescue, IFSTA, Sixth Edition

PREPARATION:

As emergency responders, we may be called to cave, tunnel, and mine rescues. Although cave, tunnel, and mine rescues require specialized training and equipment beyond the scope of most fire service personnel, fire fighters will be able to provide aboveground support. An awareness of cave, tunnel, and mine rescue techniques is necessary to fulfill that role.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p style="padding-left: 40px;">d) Nitrogen dioxide</p> <p>F. Complexity</p> <ol style="list-style-type: none"> 1. Maze-like 2. Limited access and egress 3. Multilayered <p style="padding-left: 40px;">a) Passages at different levels</p> <p>II. RESCUE EQUIPMENT</p> <p>A. Litters</p> <ol style="list-style-type: none"> 1. Smaller confined space style <ol style="list-style-type: none"> a) Flexible plastic b) Drag sheet c) Metal <p>B. Warm-gas inhalator</p> <ol style="list-style-type: none"> 1. Combats hypothermia through respiration <p>C. Cable ladders</p> <ol style="list-style-type: none"> 1. 50 feet or less <p>D. Ropes</p> <p>E. Ascending equipment</p> <ol style="list-style-type: none"> 1. Camming devices 2. Mechanical advantage <p>F. Closed system SCBA</p> <ol style="list-style-type: none"> 1. Longer duration than open circuit <p>G. Air monitoring equipment</p> <p>H. Hard-wired communications</p>	<p>What types of litter/carrying devices would be useful in cave, tunnel, or mine rescues?</p>



FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>III. AGENCIES AND REGULATIONS</p> <ul style="list-style-type: none">A. OSHAB. NIOSHC. 30 CFR 49.1-10	<p>What agencies and regulations involve cave, tunnel, and mine rescues?</p>

**SUMMARY:**

Although cave, tunnel, and mine rescues are beyond the scope of the average fire fighter's training and expertise, we may be called upon to assist as aboveground support. Cave, tunnel, and mine rescues offer unique challenges including extreme temperatures, narrow, winding passages, and low light. Special rescue equipment is often required to affect these rescues.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Service Rescue, IFSTA, Sixth Edition, Chapter 11 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: WATER AND ICE RESCUE AWARENESS

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level I

AUTHORITY: 1997 NFPA 1001 4-4.2

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of water and ice rescue by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Fire Service Rescue, IFSTA, Sixth Edition, Chapter 9

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Fire Service Rescue, IFSTA, Sixth Edition
- Swiftwater Rescue, CFS Press, 1997 Edition
- Swiftwater Rescue Technician Unit 1, Rescue 3 International, 2000 Edition
- Water Rescue for the First Responder, CFFJAC, 1999 Edition

PREPARATION:

Every year numerous fire fighters die attempting water and ice rescues. As a fire fighter, you may be required to assist in water and ice rescues. An awareness of the hazards involved in these rescues and the necessary rescue procedures is your best tool for survival.

PRESENTATION	APPLICATION
<p>I. INTRODUCTION TO WATER AND ICE RESCUE</p> <p>A. Drowning is death by suffocation</p> <ol style="list-style-type: none"> 1. Restore or support airway, respiration, and circulation <p>B. May be multiple associated injuries</p> <p>C. Complex extrications</p> <p>D. Increased risk to fire fighters</p> <ol style="list-style-type: none"> 1. Unfamiliar/hostile environments 2. Panicked victims <p>II. SAFETY CONSIDERATIONS</p> <p>A. Recognize the hazards</p> <ol style="list-style-type: none"> 1. Speed of current 2. Loads <ol style="list-style-type: none"> a) Obstructions b) Obscured vision 3. Entrapments <ol style="list-style-type: none"> a) Eddy <ol style="list-style-type: none"> 1) Resembles a whirlpool b) Strainer <ol style="list-style-type: none"> 1) Obstacle in the water that lets water pass but traps other objects <ul style="list-style-type: none"> • Debris • Bodies 	<p>Can anyone identify hazards that are associated with water and ice rescues?</p> <p>How can a victim become trapped in the water?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>4. Victim must be near solid ground</p> <p>5. Victim must be able to grasp and hold aid</p> <p>B. Throw</p> <p>1. Reaches further than "reach" method</p> <p>2. Rescuer on solid ground</p> <p>3. Victim able to grasp and hold rope</p> <p>C. Go</p> <p>1. Victim too far to reach from solid ground</p> <p>2. Rescuer crawls out onto ice</p> <p>3. Disperse rescuers weight</p> <p>a) Specialized rescue sleds</p> <p>b) Ladders</p> <p>c) Inflatable boat</p> <p>V. TYPICAL VICTIM INJURIES</p> <p>A. Cervical spine</p> <p>1. Use spinal precautions</p> <p>B. Hypothermia</p> <p>1. Treat using local guidelines</p> <p>C. Dislocations</p> <p>1. Usually shoulders</p>	<p>Can the rescuer be on the surface of the ice to perform this rescue?</p> <p>What could a rescuer use to disperse his or her weight?</p> <p>What is the most likely joint to become dislocated?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 2. Riptide <ul style="list-style-type: none"> a) Strong lateral and out-flowing current B. Rescue options <ul style="list-style-type: none"> 1. Boat 2. Surfboard 3. Paddle board C. Body search and recovery <ul style="list-style-type: none"> 1. Human chain <ul style="list-style-type: none"> a) Progressively larger sweeps b) From point victim last seen <p>VIII. TOOLS AND EQUIPMENT</p> <ul style="list-style-type: none"> A. Inflatable boats B. Flotation aids <ul style="list-style-type: none"> 1. Inflated fire hose 2. Peterson tube/lifeguard buoy 3. Ring buoy 4. Surfboard 5. Paddle board 6. Boogie board C. Reaching/grasping aids <ul style="list-style-type: none"> 1. Pike Pole 2. Ladder 3. Tool handles 4. Rope throw bag <ul style="list-style-type: none"> a) Floating rope in floating bag 5. Inflated fire hose 	<p>From what location would you start the sweeps?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>D. Ice sled</p> <p>IX. FIRE FIGHTER'S ROLE IN RESCUE OPERATIONS</p> <p>A. Support role</p> <ol style="list-style-type: none"> 1. Unless properly trained and equipped <p>B. Logistical support</p> <ol style="list-style-type: none"> 1. Tools 2. Equipment 3. Personnel 4. Communications <p>C. Rigging</p> <ol style="list-style-type: none"> 1. Tying knots 2. Building rope systems <p>D. Personnel</p> <ol style="list-style-type: none"> 1. Hauling lines 2. Information/equipment runners 	<p>With what kinds of resources could the fire fighter assist?</p> <p>What other support tasks can the fire fighter provide?</p>



FIRE FIGHTER II

SUMMARY:

Water and ice rescues are unique and beyond the scope of most fire fighters. You can however, contribute to a successful rescue by being aware of the hazards, rescue techniques, and specialized equipment needed for these rescues. Your support role is a vital component of the overall rescue effort.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Service Rescue, IFSTA, Sixth Edition, Chapter 9 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC:	TRENCH RESCUE OPERATIONS AWARENESS
TIME FRAME:	2:00
LEVEL OF INSTRUCTION:	Level II
AUTHORITY:	1997 NFPA 1001 4-4.2 and 29 CFR 1926 Subpart P, Section 650-652
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of the trench rescue operations by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Fire Service Rescue</u> , IFSTA, Sixth Edition, Chapter 10
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials
REFERENCES:	<ul style="list-style-type: none">• <u>Essentials of Fire Fighting</u>, IFSTA, Fourth Edition• <u>Fire Service Rescue</u>, IFSTA, Sixth Edition• <u>Firefighter's Handbook</u>, Delmar, 2000 Edition
PREPARATION:	Trenching is a dangerous process. There are a growing number of serious injuries and fatalities resulting from trench cave-ins. If a trench collapses, the fire fighter has little chance to avoid injury. Therefore, fire fighter safety is dependent upon the accurate knowledge of trenching procedures and safety precautions during rescues.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. INTRODUCTION</p> <ul style="list-style-type: none"> A. Rescue of a heavily trapped victim is a complicated endeavor B. This type of rescue depends upon the services of trained rescuers who have knowledge of shoring and cribbing and who are proficient in the use of rescue tools and equipment C. Trenching and tunneling operations may be combined <p>II. COMPONENTS</p> <ul style="list-style-type: none"> A. Shoring <ul style="list-style-type: none"> 1. A process of erecting a series of timbers or jacks to strengthen a wall or to prevent further collapse of an excavation 2. Not a permanent replacement 3. Always necessary 4. Timber shores, hydraulic pneumatic shores, spread jacks, ladders, improvised and horizontal shores B. Shielding/trench box <ul style="list-style-type: none"> 1. Designed to shield workers from cave-ins 2. Consist of two flat, metal, parallel walls connected by metal cross-braces 3. Forms an "open box" that allows safe work area C. Materials <ul style="list-style-type: none"> 1. Rough and improvised materials may be found on-site 2. Timbers should be strong enough to support walls and be wedged into position 	<p>What are the components of a trench rescue?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>3. Equipment</p> <ul style="list-style-type: none"> a) Screw jacks b) Sheeting c) Timber d) Wales e) Spacers f) Struts g) Wedges h) Hydraulic/pneumatic shores i) Speed shores <p>III. SAFETY CONSIDERATIONS</p> <ul style="list-style-type: none"> A. Rescue operations depend on making a site as safe as possible with shoring and cribbing <u>before</u> rescue begins <ul style="list-style-type: none"> 1. Monitor atmosphere in trench 2. Provide ventilation for victim, if needed B. Rescue apparatus, heavy equipment and spectators should be moved back to avoid causing other slides or cave-ins C. Heavy equipment should not be used until victim is located D. Tools <ul style="list-style-type: none"> 1. Use care in tool selection while searching for victims 2. Use care with tools while searching for victims E. Remove debris with baskets, buckets, or wheelbarrows to a safe area 	<p>What are some safety considerations for a safe operation?</p>

PRESENTATION	APPLICATION
<p>F. When removing debris</p> <ol style="list-style-type: none"> 1. Watch for key timbers which hold portions of earth <p>G. Fire department personnel should not enter trench without protective clothing, i.e., helmet, gloves and breathing apparatus, if applicable, and a safety line</p> <p>H. Ladders should be placed in trench on both sides of rescue area for quick exit. Ladders should extend 3 feet above top of trench and be placed no more than 25 feet apart</p> <p>I. Use sheeting on lip of trench at top side of trench to disperse weight</p> <p>J. Mechanical equipment that is used must have a guide assigned to it</p> <p>K. Be aware - other hazards may exist, such as underground wiring, water lines, explosives, toxic or flammable gases</p> <p>L. Civilians should not be ordered into a hazardous area to help the fire fighters and rescuers</p> <p>M. Trenching is used to reach a specific point, not for general clearance</p>	
<p>IV. CONSTRUCTION SAFETY GUIDELINES</p> <p>A. Spacing</p> <ol style="list-style-type: none"> 1. Shores should be no more than 4 feet apart horizontally and 4 feet apart vertically <ol style="list-style-type: none"> a) Closer if rescuer's safety is in question 2. Top shore must be no more than 18 inches from lip 3. Bottom shore must be no more than 2 feet from bottom of trench 4. Spacing of shores is totally dependent upon soil and angle of repose 	<p>What is the spacing of shoring?</p>



SUMMARY:

Trenching is a dangerous process. Shoring must be in place before any rescue attempt. Air monitoring and ventilation are critical components as well as specialized equipment.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Service Rescue, IFSTA, Sixth Edition, Chapter 10 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: ASSISTING RESCUE OPERATIONS AT AN INCIDENT

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of assisting rescue teams at an incident by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapters 2 and 3

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition

PREPARATION:

In order for rescue teams to work with maximum efficiency, the local fire department must be familiar with the rescue team's operations and requirements. If the local fire department provides the proper support functions, the rescue team will be able to concentrate on their specific tasks. All of the agencies will be able to work together for a smoother and more efficient rescue operation if each agency knows its roles and responsibilities.

PRESENTATION	APPLICATION
<p>I. RESOURCE MANAGEMENT</p> <p>A. Local fire departments must exhaust other resources before requesting specialized rescue team(s)</p> <ol style="list-style-type: none"> 1. Incident type 2. Special training needed 3. Special equipment needed 4. Other available resources <ol style="list-style-type: none"> a) Local volunteer response teams b) Public works and utilities companies <p>II. INCIDENT COMMAND</p> <p>A. Activate emergency operations center as needed</p> <p>B. Local fire departments maintains Incident Command</p> <ol style="list-style-type: none"> 1. IC makes decisions based on information from specialized rescue team(s) 2. Specialized rescue team(s) works under operations <ol style="list-style-type: none"> a) Usually as rescue group <p>III. LOGISTICAL SUPPORT</p> <p>A. Logistical support should begin when the rescue team(s) is requested</p>	<p>What types of resources are available other than specialized rescue teams?</p> <p>Who is the Incident Commander while specialized rescue teams are deployed?</p> <p>When should logistical support for a rescue team begin?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>B. Types of logistical support</p> <ol style="list-style-type: none"> 1. Physical area (staging/base) <ol style="list-style-type: none"> a) Large enough for personnel, equipment, and necessary facilities b) Far enough away from incident to allow rest for rescuers c) Sanitary facilities d) Food and drink e) Shelter 2. Transportation <ol style="list-style-type: none"> a) From staging area/base to incident site b) Medical, if needed 3. Additional human resources <ol style="list-style-type: none"> a) Additional searchers b) Medical personnel c) Personnel for debris removal 	<p>How large should a staging area/base be?</p> <p>What types of transportation needs would you expect a specialized rescue team(s) to have?</p> <p>What jobs/functions can local personnel perform?</p>



FIRE FIGHTER II

SUMMARY:

Before a fire department requests a specialized rescue team, an assessment must be made to determine if the incident requires training, experience, and equipment beyond what the local fire department can supply. Once the rescue team is deployed, the local fire department is responsible for providing an Incident Commander, a staging area or base with all of the necessary facilities, transportation, and additional personnel. Without the proper support, the rescue team will not be able to work to its potential.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapters 2 and 3 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC:	CONSIDERATIONS FOR TUNNELING THROUGH DEBRIS
TIME FRAME:	1:00
LEVEL OF INSTRUCTION:	Level II
AUTHORITY:	1997 NFPA 1001 4-4.2
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of the considerations for tunneling through debris by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Fire Service Rescue</u> , IFSTA, Sixth Edition, Chapter 6
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials
REFERENCES:	<ul style="list-style-type: none">• <u>Fire Service Rescue</u>, IFSTA, Sixth Edition
PREPARATION:	When victims are trapped deep within a pile of rubble, the only way to get to them may be to construct a tunnel. You must be familiar with the techniques used for tunneling to prevent further collapse or injury to you and your victims.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. PURPOSE</p> <p>A. To gain access to trapped victims in known locations</p> <ol style="list-style-type: none"> 1. Too dangerous and tedious to use for searching in general 2. Progress at rate of 2-3 feet per hour <p>B. Connect voids</p> <ol style="list-style-type: none"> 1. Allows travel through pile for access and removal <p>II. CONSTRUCTION</p> <p>A. Location</p> <ol style="list-style-type: none"> 1. Along wall <ol style="list-style-type: none"> a) Simplicity b) Stability <p>B. Size</p> <ol style="list-style-type: none"> 1. Big enough to bring victims out <ol style="list-style-type: none"> a) 30 inches (75 cm) wide b) 36 inches (91 cm) high <p>C. Materials</p> <ol style="list-style-type: none"> 1. Wood usually <ol style="list-style-type: none"> a) Timber/planks b) May be from collapsed building c) Beware of nails 2. Metal <ol style="list-style-type: none"> a) Difficult to cut to size b) Sharp edges 	<p>How big should tunnel be?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>D. Irregular shape</p> <ol style="list-style-type: none"> 1. Follows contours of debris 2. Wedge against stable debris 3. Do not use tunnel material to jack up debris <p style="margin-left: 40px;">a) Not strong enough</p> <p style="margin-left: 40px;">b) May cause whole pile to shift</p> <p style="margin-left: 40px;">c) May cause other tunnel members to become loose</p> <p>E. May be premade sections</p> <ol style="list-style-type: none"> 1. 2"x4" and 2"x6" boards 	<p>Why not?</p>



FIRE FIGHTER II

SUMMARY:

Tunneling is very dangerous work and must not be undertaken without extensive training. However, all fire fighters should be aware of the basics so they may assist at the scene of an emergency when necessary. This includes materials that can be used to construct tunnels and how large tunnels should be. Many times the materials used to construct tunnels are debris from the collapse.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Service Rescue, IFSTA, Sixth Edition, Chapter 6 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC:	BASIC CONSIDERATIONS FOR CONSTRUCTING SHAFTS IN DEBRIS
TIME FRAME:	1:00
LEVEL OF INSTRUCTION:	Level II
AUTHORITY:	1997 NFPA 1001 4-4.2
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of the basic considerations for constructing shafts in debris by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Fire Service Rescue</u> , IFSTA, Sixth Edition, Chapter 6
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials
REFERENCES:	<ul style="list-style-type: none">• <u>Fire Service Rescue</u>, IFSTA, Sixth Edition
PREPARATION:	The construction of a shaft in debris is a very hazardous and time-consuming task. Every participant in the process must be aware of what is going on and how to keep from causing great harm to the whole rescue process.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>E. Time</p> <ol style="list-style-type: none"> 1. May progress at 2-3 feet per hour <p>III. PERSONNEL SPECIALISTS</p> <p>A. Heavy equipment operators</p> <ol style="list-style-type: none"> 1. Civilian 2. Army Corp of Engineers 3. Military 4. Heavy rescue technical specialists <p>B. Utilities</p> <ol style="list-style-type: none"> 1. Locator service 2. Cut or repair lines <p>C. Materials support</p> <ol style="list-style-type: none"> 1. Lumber yard 2. Truck drivers <ol style="list-style-type: none"> a) Dump trucks b) Delivery trucks <ol style="list-style-type: none"> 1) Lumber 2) Tools <p>IV. CONSTRUCTION</p> <p>A. Actually outside of basement wall</p> <ol style="list-style-type: none"> 1. More stability <p>B. Shoring</p> <ol style="list-style-type: none"> 1. All four sides 2. Against wall of building too 	<p>Is this a job that can be done in a hurry?</p> <p>What are some support agencies we may use during an operation?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 3. May be under stress from debris pushing out 4. May be weakened by debris movement/removal 5. Provides strong bracing <p>C. Size</p> <ul style="list-style-type: none"> 1. Large enough to move victims and debris through 2. Wider than tunnels that connect to it 3. Must vary by conditions 4. 6'x6' is optimal 	



FIRE FIGHTER II

SUMMARY:

Shaft construction is a job for specialists. However, all fire fighters should know the basic considerations so that they may effectively and safely work as members of the team. The three rules are safety, safety, and safety.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Service Rescue, IFSTA, Sixth Edition, Chapter 6 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: CONSIDERATIONS FOR DEBRIS REMOVAL FROM A COLLAPSED BUILDING

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-4.2

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of debris removal from a collapsed building by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Fire Service Rescue, IFSTA, Sixth Edition Chapter 6

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Fire Service Rescue, IFSTA, Sixth Edition

PREPARATION:

Properly removing debris from a collapsed building site can mean the difference between rescuing a viable victim and recovering a body. If you cause further collapse by using improper procedures, you may in fact do more harm than the original incident that caused the collapse.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. GENERAL CONSIDERATIONS</p> <ul style="list-style-type: none"> A. Stability of the structure B. Types of debris C. Amount of debris <ul style="list-style-type: none"> 1. Weight 2. Volume D. Personnel available E. Equipment available F. Potential number of victims G. Possible location of victims H. Coordination of efforts I. Where to put debris <p>II. DEBRIS</p> <ul style="list-style-type: none"> A. Soft or loose debris <ul style="list-style-type: none"> 1. From a landslide or avalanche <ul style="list-style-type: none"> a) Sand b) Dirt c) Snow 2. From parts of building <ul style="list-style-type: none"> a) Bricks b) Glass c) Furnishings d) Timber 	<p>What are some of the first considerations you need to think about in debris removal?</p> <p>What types of debris are there?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> e) Sheet rock/plaster f) Wires/pipes <p>B. Large/heavy debris</p> <ul style="list-style-type: none"> 1. From outside building <ul style="list-style-type: none"> a) Trees b) Cars c) Planes 2. From parts of building <ul style="list-style-type: none"> a) Concrete slabs b) Floor/wall sections c) Large beams d) Heating/air conditioning units e) Water tanks <p>C. Amount of debris</p> <ul style="list-style-type: none"> 1. Personnel and equipment requirements 2. Time requirements 3. Disposal site requirements <p>D. Location of debris pile</p> <ul style="list-style-type: none"> 1. Refuse pile may be bigger than collapse pile <ul style="list-style-type: none"> a) Not compacted 	<p>What are some examples of large debris that are not part of the building?</p> <p>What are some of the considerations regarding the amount of debris to be removed?</p> <p>What do you do with the debris?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>2. Do not block roadways</p> <p>3. Far enough away</p> <p style="padding-left: 40px;">a) Will not fall back on you or be in your way</p> <p>III. PERSONNEL</p> <p>A. Medical</p> <p>B. Technical</p> <p>1. Equipment operators</p> <p>2. Construction specialists</p> <p>3. Search and security dog handlers</p> <p>4. Utilities companies</p> <p>5. Specialized rescue teams</p> <p>6. Structural engineers</p> <p>7. Dog handlers and search dogs</p> <p>C. Excavation</p> <p>D. Numbers</p> <p>1. Medical</p> <p style="padding-left: 40px;">a) Depends upon number of victims</p> <p style="padding-left: 40px;">b) Try to bring victims to medics</p> <p style="padding-left: 40px;">c) Use local triage protocols</p> <p>2. Technical</p> <p style="padding-left: 40px;">a) Usually fewer in number</p> <p style="padding-left: 40px;">b) May be very important early on</p>	<p>What are some technical types of people you may need?</p> <p>How many and what type of personnel do you need for various situations?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>3. Special equipment</p> <ul style="list-style-type: none"> a) Infrared heat detectors b) Microphones and listening devices c) Air monitoring equipment d) Lights e) Search cameras <p>V. VICTIMS</p> <p>A. Number of victims has an impact on</p> <ul style="list-style-type: none"> 1. Number of medical personnel 2. Number of ambulances 3. Size of area to be searched <p>B. Location of victims</p> <ul style="list-style-type: none"> 1. Hazards <ul style="list-style-type: none"> a) Below ground level <ul style="list-style-type: none"> 1) Flammable vapors 2) Difficult to lift debris out by hand b) Above ground level <ul style="list-style-type: none"> 1) Dangerous footing 2) No footing for ladders 3) Victims must be lowered 	<p>What are some special types of equipment?</p> <p>What impact does the number of victims have on an operation?</p> <p>What hazards and problems should the rescuer be aware of when locating victims?</p>



FIRE FIGHTER II

SUMMARY:

There is much more to consider in debris removal than just throwing chunks of concrete around. Consideration must be given to the stability of the building, debris, number of victims, number of rescuers required, and what equipment is available. In order to function well, fire fighters must adhere to the ICS and understand the six stages of collapse rescue.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Service Rescue, IFSTA, Sixth Edition Chapter 6 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: EMERGENCIES REQUIRING ROPE RESCUE
TECHNIQUES

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of emergencies requiring rope rescue techniques by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Fire Service Rescue, IFSTA, Sixth Edition, Chapter 1

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Fire Service Rescue, IFSTA, Sixth Edition

PREPARATION: Rope rescue techniques are the universal tool in the technical rescue environment. It is vital to know which types of rescue scenarios require rope rescue techniques.

PRESENTATION	APPLICATION
<p>I. ASSESSING THE NEED FOR ROPE RESCUE</p> <ul style="list-style-type: none"> A. Stabilization B. Raising C. Lowering D. Hauling E. Tying off F. Tying together/lashing <p>II. EMERGENCIES REQUIRING ROPE RESCUE</p> <ul style="list-style-type: none"> A. Vehicle rescue B. Water and ice rescue C. Confined space rescue D. Trench rescue E. Collapse rescue F. Low angle rescue G. High angle rescue H. Mine/cave rescue I. Industrial rescues J. Other situations <ul style="list-style-type: none"> 1. Be creative 	<p>Which rescue tasks can be performed using ropes?</p> <p>Which types of rescue situations might require rope rescue techniques?</p>



FIRE FIGHTER II

SUMMARY:

Rope rescue techniques can be applied to numerous types of emergencies. Knowing when to utilize these procedures will provide for better rescue assessment and smoother operations.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Service Rescue, IFSTA, Sixth Edition, Chapter 1 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: BASIC ROPE RESCUE SAFETY

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of basic rope rescue safety by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 6

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials
- Webbing
- Rescue ropes
- Hardware

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition
- High Angle Rescue Techniques, Vines and Hudson, Second Edition

PREPARATION:

Rope rescues offer hazards that are not usually encountered on a daily basis. To ensure the safety of the rescuers while successfully completing a rescue, several safety items must be identified and observed. It is every rescuer's job to think "safety."

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>D. All persons who are working within 6 feet of an unprotected edge will be secured by a rope or a web sling attached to their harness</p> <p>E. System ready for operation</p> <p>1. The leader will request a response from each of the following positions (where applicable) confirming that position's readiness</p> <ul style="list-style-type: none">a) Belay lineb) Lowering linec) Haul lined) Rescuere) Rappeller	<p>Which positions should respond to the leader?</p>



FIRE FIGHTER II

SUMMARY:

Basic rope rescue is a useful tool during rescue operations. Safety precautions include checking the entire rope system, providing adequate communications, and following commands.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 6 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: CHARACTERISTICS AND FUNCTIONS OF RESCUE/LIFE SAFETY HARDWARE

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the characteristics and functions of rescue/life safety hardware by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 4

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition

PREPARATION: In order to build a technical rescue system, the fire fighter must have a working knowledge of the rescue and life safety hardware that is used in the systems. If the wrong piece of equipment is used or the correct piece of equipment is used incorrectly, the system may fail, resulting in injury or death to both victims and fire fighters.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 2. Construction <ul style="list-style-type: none"> a) Steel or aluminum b) Bronze bushings or steel bearings 3. Size <ul style="list-style-type: none"> a) 2-inch (minimum) <ul style="list-style-type: none"> 1) Allows full rope strength with ½-inch rope 2) Formula: pulley 4x diameter of rope prevents damage b) 4-inch c) Knot passing <ul style="list-style-type: none"> 1) Allows knotted ropes to go through pulley 4. Cautions <ul style="list-style-type: none"> a) Use proper diameter rope for pulley 	<p>Why is 2 inches the minimum diameter for a rescue pulley?</p>
<ul style="list-style-type: none"> C. Gibb's ascender <ul style="list-style-type: none"> 1. Use <ul style="list-style-type: none"> a) Pulling cam <ul style="list-style-type: none"> 1) Attached to the rope for hauling b) Braking cam <ul style="list-style-type: none"> 1) Attaches to rope and anchor to stop rope 2. Application <ul style="list-style-type: none"> a) Attach to rope b) Demonstrate pulling cam 	<p>What can Gibb's ascenders be used for?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>c) Demonstrate braking cam</p> <p>3. Construction</p> <p>a) Steel or aluminum</p> <p>b) Parts</p> <p>1) Sleeve</p> <p>2) Pin</p> <p>3) Cam</p> <ul style="list-style-type: none"> • Can be spring-loaded <p>4. Cautions</p> <p>a) Check that pin is through cam and completely seated in sleeve</p> <p>b) Remove all slack when using in system</p> <p>1) Shock loads can cause rope to part</p> <p>D. Figure eight plate</p> <p>1. Use</p> <p>a) Gather equipment</p> <p>b) Friction</p> <p>2. Application</p> <p>a) Demonstrate gathering equipment</p> <p>b) Demonstrate friction device</p> <p>3. Construction</p> <p>a) Steel or aluminum</p> <p>b) With or without "ears"</p>	<p>What precautions must be taken with Gibb's ascenders?</p> <p>What are figure eight plates used for?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>4. Cautions</p> <p>a) Throw away if worn to less than $\frac{1}{3}$ the original diameter</p> <p>b) Dirty ropes cause accelerated wear</p> <p>E. Brake bar rack</p> <p>1. Use</p> <p>a) Friction</p> <p>1) Belay device</p> <ul style="list-style-type: none"> • Lowering a load • Rappelling <p>2. Application</p> <p>a) Demonstrate using a lowering belay device</p> <p>b) Demonstrate as rappelling device</p> <p>3. Construction</p> <p>a) Stainless steel or aluminum</p> <p>b) With or without twist in connection point</p> <p>c) With or without lock-off tabs</p> <p>4. Cautions</p> <p>a) Only qualified personnel should use</p> <p>b) Possible for rope to be released from device</p> <p>1) Even under load</p>	<p>When should a figure eight plate be thrown away?</p> <p>How can you use the friction capabilities of a brake bar rack?</p> <p>What precautions should be taken?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>F. Edge protection</p> <ol style="list-style-type: none"> 1. Use <ol style="list-style-type: none"> a) Protect rope and webbing from abrasions and sharp edges 2. Application <ol style="list-style-type: none"> a) Demonstrate with rope over an edge 3. Construction <ol style="list-style-type: none"> a) Premade steel or aluminum <ol style="list-style-type: none"> 1) Rollers 2) Smooth bars b) UHMW (Ultra High Molecular Weight) plastic c) Fire hose d) Prefabricated attachment points 4. Cautions <ol style="list-style-type: none"> a) Secure edge protection <ol style="list-style-type: none"> 1) To prevent from sliding out and damaging rope b) Keep clean <ol style="list-style-type: none"> 1) To prevent rope damage from contaminants 	<p>What materials can be used as edge protection?</p> <p>How is edge protection held in place?</p> <p>Why should edge protection devices be kept clean?</p>



FIRE FIGHTER II

SUMMARY:

In order to build technical rescue systems, the fire fighter must be familiar with the hardware required in those systems. All technical rescue systems require combinations of software and carabiners, pulleys, Gibb's ascenders, figure eight plates, brake bar racks and/or edge protection. Rescue/life safety hardware must be used in the right place at the right time or injury or death may result.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 4 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: INSPECTION AND MAINTENANCE OF RESCUE/LIFE SAFETY HARDWARE

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the inspection and maintenance of rescue/life safety hardware by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 4

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition

PREPARATION: Technical rescues are stressful events. Emotions are high and a sense of urgency nearly always prevails. Fire fighters are working under pressure to build an appropriate rope system. The system is build, a rescuer is "on rope," but the system fails and the rescuer falls, resulting major injuries. All of the right pieces of equipment were in the right places BUT a worn piece of hardware failed because it was worn. This scenario may sound far-fetched but it has happened. It is vital to properly inspect, care for, and maintain rescue/life safety hardware. Your life may literally depend on this equipment.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. CARABINER</p> <p>A. Inspection</p> <ol style="list-style-type: none"> 1. Rust 2. Dents/burrs 3. Proper gate function 4. Proper lock function <p>B. Maintenance</p> <ol style="list-style-type: none"> 1. Do not drop or throw <ol style="list-style-type: none"> a) Keep in your hand, in the system or in the cache 2. Do not attach to hard-edge metal anchor points, if possible <ol style="list-style-type: none"> a) Causes dents/burrs 3. Wipe with clean cloth 4. Remove burrs with small file or emery cloth <p>II. PULLEY</p> <p>A. Inspection</p> <ol style="list-style-type: none"> 1. Proper movement of cheeks/sides and sheave 2. Shape/wear of attachment hole 3. Tightness of assembly nut/bolt <p>B. Maintenance</p> <ol style="list-style-type: none"> 1. Do not drop or throw 2. Keep clean 3. Wipe with clean cloth 4. Do not lubricate bushings/bearings 	<p>What would you inspect a carabiner for?</p> <p>How can you remove burrs from a carabiner?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p style="text-align: center;">a) Lubricant attracts dirt and grit</p> <p>III. FIGURE EIGHT PLATE</p> <p>A. Inspection</p> <ol style="list-style-type: none"> 1. Dents/burrs 2. Cracks 3. Sharp Edges <ol style="list-style-type: none"> a) Usually caused by rope wear 4. Thickness of material <ol style="list-style-type: none"> a) Worn to more than $\frac{1}{3}$ diameter must be taken out of service <p>B. Maintenance</p> <ol style="list-style-type: none"> 1. Do not drop or throw 2. Keep clean 3. Wipe with clean cloth 4. Smooth sharp edges and burrs with small file or emery cloth <p>IV. GIBB'S ASCENDER</p> <p>A. Inspection</p> <ol style="list-style-type: none"> 1. Worn cam teeth 	<p>Why shouldn't you lubricate the bushings/bearings?</p> <p>How thick must the material be before a figure eight plate is taken out of service?</p> <p>What can be used to smooth small dents and burrs?</p> <p>What would you inspect a Gibb's ascender for?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 2. Egg-shaped holes in pin placement 3. Cracks around holes for pin placement 4. Worn cam retention chain/cable 5. Burrs on sleeve <p>B. Maintenance</p> <ul style="list-style-type: none"> 1. Do not drop or throw 2. Keep assembled for storage 3. Keep clean 4. Wipe with clean cloth 5. Smooth burrs with small file or emery cloth <p>V. BRAKE BAR RACK</p> <p>A. Inspection</p> <ul style="list-style-type: none"> 1. Rack frame for bends 2. Bars for bends/dents 3. Bars slide on frame easily 4. Bars clasp to frame easily 5. Tightness of rack nut 6. Excessive wear on guide bar <ul style="list-style-type: none"> a) Aluminum <p>B. Maintenance</p> <ul style="list-style-type: none"> 1. Do not drop or throw 2. Keep clean 3. Wipe with clean cloth 	<p>What problems would you look for on the bars of a brake bar rack?</p> <p>What would you inspect the rack nut for?</p>



FIRE FIGHTER II

SUMMARY:

In order for technical systems to work as designed and reduce system failure, rescue/life safety hardware must be maintained in serviceable condition. Hardware must be inspected for cleanliness and damage. Proper repairs must be made using the correct tools and the hardware must be kept clean and stored properly. Placing the right piece of equipment in the right place in a technical system is critical, but the piece of equipment must work as designed.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 4 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: HOW TO TIE A PELVIC HARNESS

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: Webbing and appropriate personal protective equipment

Behavior: The student will tie a pelvic harness

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- 20-foot length of 1-inch webbing
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 12

PREPARATION:

The pelvic harness is an extremely important part of a rescue system. The fact that the fire fighter's life depends upon the harness being properly tied, it is critical that the fire fighter ties the pelvic harness completely and with precision.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Grasp webbing	1a. Midpoint of webbing with one hand b. Four feet off center with other hand
2. Place around back	2a. Lower back
3. Cross webbing	3a. In front
4. Wrap webbing	4a. Twice b. Tightly
5. Place ends	5a. Between legs b. Front to back
6. Bring ends	6a. To front b. Both sides c. Tightly
7. Wrap	7a. Under pelvic webbing b. Both sides c. Under and over pelvic section
8. Pass ends	8a. Around back b. Right to left c. Left to right
9. Wrap one end	9a. Under original wrap b. Opposite rappel hand c. In front d. Twice
10. Tie square knot	10a. Opposite rappel hand
11. Secure knot	11a. Overhand on both sides of square knot



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO SECURE A VICTIM TO A RESCUE LITTER USING THE CHEST, PELVIC, AND EXTERIOR LASH METHODS

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: Three lengths of webbing, a rescue litter, and appropriate personal protective equipment

Behavior: The student will secure a victim to a rescue litter using the chest, pelvic, and exterior lash methods

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- Three 20-foot lengths of 1-inch webbing
- Rescue litter
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 13

PREPARATION:

To complete most rescue operations, a few basic skills must be mastered. Knowing how to properly secure a victim in a rescue litter will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
<ol style="list-style-type: none"> 1. Lay one length of webbing 2. Form an 18-inch loop 3. Lay loop 	<ol style="list-style-type: none"> 1a. Across litter b. At level of a victim's crotch c. Transverse to the litter d. With midpoint of webbing at the center of the litter 2a. In a length of webbing b. With the loop at the midpoint of the webbing 3a. In the litter b. At the location of a victim's head c. With cross at the location of a victim's shoulder blades d. Webbing ends laying over main frame e. One end on each side
<p>NOTE: Have a student lie on his or her back in the rescue litter.</p>	
<p>CHEST LASH</p>	
<ol style="list-style-type: none"> 1. Pass loop 2. Wrap webbing ends 3. Remove slack 	<ol style="list-style-type: none"> 1a. Over victim's head b. To nipple line 2a. Under each arms and through loop b. At chest 3a. Ensuring crossed webbing at victim's shoulder blades does not ride up on neck

OPERATIONS	KEY POINTS
4. Tie an overhand knot	4a. In the webbing b. Around the loop at the point is passes over the nipples c. Both sides
5. Tie a round turn and two half hitches	5a. At the ends of the webbing b. Around a rib below the victim's waist c. Where the rib meets the main frame d. Removing slack e. To secure the webbing
PELVIC LASH	
1. Pull midpoint of webbing	1a. Through victim's legs b. Up to victim's waist c. Creating a 6-inch triangle
2. Wrap webbing	2a. Around victim's thighs
3. Pass ends of webbing	3a. Through the triangle b. Pulling up towards the shoulder c. Removing slack
4. Tie an overhand knot	4a. In the webbing b. At the point it passes through the triangle c. Both sides of triangle

FIRE FIGHTER II

OPERATIONS	KEY POINTS
5. Tie a round turn and two half hitches	5a. At the ends of the webbing b. Around a rib near the victim's shoulder c. Where the rib meets the main frame d. Removing slack e. To secure the webbing
EXTERIOR LASH	
1. Place one length of webbing	1a. Across the victim's legs below the knees b. Midpoint of the webbing between the knees
2. Pass ends of the webbing	2a. Around the rib below the victim's knees b. Both sides c. Where the rib meets the main frame d. Removing slack e. Do not wrap the main frame
3. Cross the webbing	
4. Pass ends of the webbing	4a. Around the next rib b. Moving towards the head c. Both sides d. Where the rib meets the main frame e. Removing slack
5. Repeat Operations 3 and 4	5a. Until webbing passes around the rib near the shoulder

FIRE FIGHTER II

OPERATIONS	KEY POINTS
6. Tie a round turn and two half hitches	6a. At one end of the webbing b. Around a rib near the victim's shoulder c. Where the rib meets the main frame d. To secure the webbing
7. Pull slack	7a. From secured end b. Toward free end
8. Tie a round turn and two half hitches	8a. At the end of the webbing b. Around a rib near the victim's shoulder c. Where the rib meets the main frame d. To secure the webbing



APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

- TOPIC:** HOW TO RIG A RESCUE LITTER FOR RAISING OR LOWERING A VICTIM IN A HORIZONTAL POSITION
- TIME FRAME:** 0:15
- LEVEL OF INSTRUCTION:** Level II
- AUTHORITY:** SBFS
- BEHAVIORAL OBJECTIVE:**
- Condition:** Two lengths of webbing, a rescue litter, pre-rig, rescue rope, carabiners, and appropriate personal protective equipment
- Behavior:** The student will rig a rescue litter for raising or lowering a victim in a horizontal position
- Standard:** Completing all operations within _____ according to the job breakdown
- MATERIALS NEEDED:**
- Job breakdown
 - 2 20-foot lengths of 1-inch webbing
 - 1 rescue litter
 - 1 pre-rig
 - 2 rescue ropes
 - 8 carabiners
 - Appropriate personal protective equipment
- REFERENCES:**
- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 13
- PREPARATION:** To complete most rescue operations, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Attach half of pre-rig	1a. To rescue litter main frame b. At lift points near victim's shoulder c. With carabiners d. Gates directed down and toward the victim
2. Lock the carabiners	
3. Attach half of pre-rig	3a. To rescue litter main frame b. At lift points near victim's knees c. With carabiners d. Gates directed down and toward the victim
4. Lock carabiners	
5. Tie a figure eight on a bight	5a. In the end of the main line b. Leaving a 6-inch tail
6. Tie a figure eight on a bight	6a. In the end of the belay line b. Leaving a 6-inch tail
7. Attach the carabiners	7a. At the top of each half of the pre-rig to the figure eights on a bight b. In the ends of the main and belay lines c. Gates directed down and opposed
8. Lock carabiners	
9. Move prusiks	9a. On each leg of the pre-rig b. To adjust attitude of the rescue litter c. Normally with head slightly higher than feet d. Shoulder line horizontal

OPERATIONS	KEY POINTS
<i>IMPROVISED PRE-RIG</i>	
1. Tie an overhand on a bight	1a. At midpoint of a 20-foot piece of webbing b. Forming a 3-inch bight
2. Tie an overhand on a bight	2a. On each leg b. 2 inches from the center overhand on a bight c. Forming a 3-inch bight
3. Pass webbing ends	3a. Under main frame b. At lift point near shoulders c. Both sides
4. Pass webbing ends	4a. Through the 3-inch bights b. On each leg
5. Tie an overhand on a bight	5a. At midpoint of a 20-foot piece of webbing b. Forming a 3-inch bight
6. Tie an overhand on a bight	6a. On each leg b. 12 inches from the center overhand on a bight c. Forming a 3-inch bight
7. Pass webbing ends	7a. Under main frame b. At lift points near knees c. Both sides
8. Pass webbing ends	8a. Through the 3-inch bight b. On each leg

FIRE FIGHTER II

OPERATIONS	KEY POINTS
9. Tie a figure eight on a bight	9a. In the end of the main line b. Leaving a 6-inch tail
10. Tie a figure eight on a bight	10a. In the end of the belay line b. Leaving a 6-inch tail
11. Attach the carabiners	11a. At the top of each half of the improvised pre-rig b. To the figure eights on a bight c. In the ends of the main and belay lines d. Gates directed down and opposed
12. Lock carabiners	
13. Pull webbing ends	13a. Through the 3-inch bights b. On each leg of the improvised pre-rig c. To adjust attitude of the rescue litter d. Normally head slightly higher than feet e. Shoulder line horizontal
14. Secure webbing ends	14a. With two half hitches



APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: INTRODUCTION TO ANCHOR SYSTEMS

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of anchor systems by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 11

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition

PREPARATION:

One of the keys to the success of a rope rescue system is based on the integrity of its anchors. The equipment used in the system is of little use without proper anchors. In this lesson, we will cover information that will allow a rescuer to select and rig anchors that will ensure the safety of both the team and victim, and the efficiency of the system.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. DEFINITION</p> <p>A. Anchors</p> <ol style="list-style-type: none"> 1. Stationary holdfast to which rope system (rigging) is attached 2. "Bomb proof" anchors <ol style="list-style-type: none"> a) Term used to refer to a single anchor point capable of sustaining the actual or potential forces exerted on the rope system without possibility of failure <p>B. Anchors must be able to withstand high loads, including forces that are greater than the load that is being lifted/lowered, hauled or stabilized</p> <p>II. TYPES OF ANCHORS</p> <p>A. Natural anchors</p> <ol style="list-style-type: none"> 1. Can be obvious or obscure 2. Most frequently associated with wildland environments, but can also have urban applications 3. Examples of natural anchors <ol style="list-style-type: none"> a) Trees b) Boulders c) Brush d) Root systems 	<p>What is meant by "bomb proof" anchor?</p> <p>What are the two general types of anchors?</p> <p>What have you used or rigged as a natural anchor during an actual rescue?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>4. Natural anchor concerns</p> <ul style="list-style-type: none"> a) Live is better than dead b) Condition of root system <ul style="list-style-type: none"> 1) Undercut 2) Exposed c) Directional load constraints d) Mass <ul style="list-style-type: none"> 1) Big is better than small <p>B. Artificial or fabricated anchors</p> <ul style="list-style-type: none"> 1. In an urban catastrophe, rescuers must be prepared to locate and/or rig fabricated anchors 2. Examples of artificial or fabricated anchors <ul style="list-style-type: none"> a) Fire trucks b) Buildings c) Structural components d) Improvised <ul style="list-style-type: none"> 1) Rigging anchors could even consist of placing a piece of furniture or pry bar across a doorway and attaching the system to these improvised anchors e) Chocks f) Pitons 	<p>Are live trees better than dead trees for anchors?</p> <p>Can you identify some fabricated anchors?</p>

PRESENTATION	APPLICATION
<p>3. Fabricated anchor concerns</p> <ul style="list-style-type: none"> a) Disable and chock vehicles b) When using exposed structural components, inspect component connections to rest of building c) Beware of light weight metal stud sheet rock interior walls d) Be cautious of structural connections when working in a partially collapsed building e) Directional load constraints <p>III. SELECTING ANCHORS</p> <ul style="list-style-type: none"> A. The rescuer must give careful consideration to the selection of any anchor(s) to be used in a rope rescue system B. Ideally the rescuer should choose a single bomb proof anchor, if available C. Other considerations <ul style="list-style-type: none"> 1. Purpose of the system 2. Amount of load 3. Direction of pull/loading 4. Strength of the anchor 5. Mass of the anchor 6. Contour of the anchor 	<p>What must be done to vehicles if they are to be used as anchors?</p> <p>What are some considerations for selecting anchors?</p> <p>What are other considerations in choosing an anchor?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>7. Location of the anchor</p> <p>NOTE: The following anchor attachments are listed in order, with the method of attachment causing the greatest stress on the rope or sling listed first. Demonstrate all five attachments.</p> <p>IV. ATTACHING ANCHORS</p> <p>A. Single point anchor</p> <ol style="list-style-type: none"> 1. Lark's foot/girth hitch <ol style="list-style-type: none"> a) May be used in applications where a quick attachment is required b) Should be limited to use in supporting a one-person load only 2. Single loop <ol style="list-style-type: none"> a) Used for special applications only such as the ladder sling b) Should be limited to use in supporting a one-person load only 3. 3-bight/basket sling <ol style="list-style-type: none"> a) May be used in applications where a quick attachment is required 4. Multi-loop <ol style="list-style-type: none"> a) The wrap-3-pull-2 multi-loop anchor fashioned from 1-inch tubular webbing will be the most frequently used attachment in this course 	<p>What anchor attachment is the quickest to attach?</p> <p>What attachment would be used for a ladder sling?</p> <p>Describe a multi-loop in terms of the number of wraps?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>b) The overhand bend that creates the sling rests against the anchor point facing the load</p> <p>1) This is the location where there is the least stress on the webbing</p> <p>5. Full strength tie off</p> <p>a) Anchor point must</p> <p>1) Be oval or round in shape</p> <p>2) Be at least four times the diameter of the rope used to maintain full strength of the rope</p> <p>3) Have a somewhat smooth surface such as a pipe, pole, tree, etc.</p> <ul style="list-style-type: none"> • Minimum of three wraps (more required on slick surfaces) • If the rope is wrapped around a tree, do not wrap more than 4 full turns • The tension on the wraps could cause the bark to spin on the tree <p>b) The friction of the rope against the surface holds the rope in place</p> <p>c) An overhand knot backed up with two half hitches is tied around the running end of the rope with the standing end to prevent gravity from unwinding it from the anchor</p>	<p>In a full strength tie off, how much larger in diameter must the anchor be than the rope?</p> <p>What holds a rope in place?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>d) The working end of the rope entering the full strength tie off must remain straight and not bent by the double overhand knot securing the standing end</p> <p>e) Caution</p> <ol style="list-style-type: none"> 1) An oily or greasy pole will contaminate the rope 2) Use web anchor sling as an alternative 3) Repeated use on rough surfaces (i.e., tree) can accelerate sheath wear <p>B. Multi-point anchor</p> <ol style="list-style-type: none"> 1. Situations may arise where the rescuer will not have a single point anchor available that is adequate to support the system <ol style="list-style-type: none"> a) At such times, the rescuer will need to develop and rig a multi-point anchor 2. Consists of two or more single anchor points that may be inadequate to support the system but when properly rigged together are capable of bearing the expected load <ol style="list-style-type: none"> a) Requires careful planning and rigging 	<p>What may contaminate the rope when using a pole as the anchor?</p> <p>Where might you need to use a multi-point anchor?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>b) Centers the system between two or more anchor points</p> <ol style="list-style-type: none"> 1) Usually no more than three <p>c) Allows the load to be distributed to each anchor point by permitting the point of attachment to shift within the anchor as the system is loaded</p> <p>d) Caution</p> <ol style="list-style-type: none"> 1) Once the full load is on the system, the friction is too great to allow further distribution <p>e) The ability to shift the point of attachment within the anchor system creates a possible problem</p> <ol style="list-style-type: none"> 1) If one of the anchor points fails, the shift to the remaining anchor points will cause a drop in the system toward the load 2) If the anchor legs are long, this drop can create a shock load on the remaining anchor points that may result in their failure 3) Keeping the anchor legs short (12 inches maximum), reduces this problem 	<p>What do you think a self-adjusting anchor system does?</p> <p>How do you think a self-adjusting system works?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>c) Anchor points are tensioned together with Spanish Windlass, pulley, or other mechanical advantage system which is then tied off and secured</p> <p>1) When employing rope or webbing that has been tensioned and tied off, rescuers should recheck tension prior to operation of the system and re-tension if necessary</p> <ul style="list-style-type: none"> • To eliminate slack caused by stretch in the material, also known as creep <p>d) When back-tied anchors remain in-line with the rope</p> <p>1) A shift from side to side of greater than 15° may cause one or more of the in-line anchor points to fail due to overload starting with the anchor point closest to the load</p> <p>e) To gain more side-to-side strength, anchor points are chosen to spread the back-tied system out in a "V" pattern behind the anchor point closest to the load</p>	<p>What should fire fighters do after they have tied off?</p> <p>How far can a back-tied anchor move off-line?</p>
<p>V. CRITICAL ANGLE</p> <p>A. Load must be divided equally between anchor points</p> <ol style="list-style-type: none"> 1. When utilizing load sharing or self-adjusting multi-point anchor systems 	<p>What is meant by critical angle?</p>



FIRE FIGHTER II

SUMMARY:

The selection of anchors must be very thorough and discriminative. The rope rescue system is only as strong as its weakest component. The importance of experience and good judgment in selecting anchors cannot be over emphasized.

EVALUATION:

The student will complete a written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 11 in order to prepare for the upcoming test. Study for the next session.

TOPIC:	HOW TO TIE A LARK'S FOOT ANCHOR SLING
TIME FRAME:	0:15
LEVEL OF INSTRUCTION:	Level II
AUTHORITY:	SBFS
BEHAVIORAL OBJECTIVE:	
Condition:	Webbing, tie rope, carabiner, anchor point, and appropriate personal protective equipment
Behavior:	The student will tie a lark's foot anchor sling
Standard:	Completing all operations within _____ according to the job breakdown
MATERIALS NEEDED:	<ul style="list-style-type: none">• Job breakdown• 5-foot length of 1-inch webbing• Length of ½-inch tie rope• Carabiner• Anchor point• Appropriate personal protective equipment
REFERENCES:	<ul style="list-style-type: none">• <u>Rescue Systems 1 Student Manual</u>, SFT, 2000 Edition, Chapter 11
PREPARATION:	To complete most rescue systems, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Tie an overhand bend	1a. In the webbing b. Remove any twist c. Leaving a 2-inch tail d. To create a sling
2. Form a bight	2a. At one end of the sling
3. Pass the bight end	3a. Around the anchor
4. Pass the bight	4a. At the opposite end of the sling b. Through the first bight
5. Position the overhand bend	5a. Between the bight at the load side and the anchor point
6. Attach the carabiner	6a. To the bight formed as the web sling is pulled toward the load b. Biting down c. Flipping up
7. Tie a figure eight	7a. On a bight b. At the end of the tie rope c. Leaving a 6-inch tail
8. Attach the carabiner	8a. To the figure eight on a bight
9. Lock the carabiner	



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC:	HOW TO TIE A SINGLE LOOP ANCHOR SLING
TIME FRAME:	0:15
LEVEL OF INSTRUCTION:	Level II
AUTHORITY:	SBFS
BEHAVIORAL OBJECTIVE:	
Condition:	Webbing, tie rope, carabiner, anchor point, and appropriate personal protective equipment
Behavior:	The student will tie a single loop anchor sling
Standard:	Completing all operations within _____ according to the job breakdown
MATERIALS NEEDED:	<ul style="list-style-type: none">• Job breakdown• 5-foot length of 1-inch webbing• Length of ½-inch tie rope• Carabiner• Anchor point• Appropriate personal protective equipment
REFERENCES:	<ul style="list-style-type: none">• <u>Rescue Systems 1 Student Manual</u>, SFT, 2000 Edition, Chapter 11
PREPARATION:	To complete most rescue systems, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Pass the working end of the webbing	1a. Around the anchor point
2. Tie an overhand bend	2a. In the webbing
3. Position the overhand bend	3a. Away from the anchor point and the bight formed as the web sling is pulled toward the load
4. Attach the carabiner	4a. To the sling at the bight formed as the web sling is pulled toward the load b. Biting down c. Flipping up
5. Tie a figure eight	5a. On a bight b. At the end of the rope c. Leaving a 6-inch tail
6. Attach the carabiner	6a. To the figure eight on a bight
7. Lock the carabiner	



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO TIE A 3-BIGHT ANCHOR SLING

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: Webbing, tie rope, carabiner, anchor point, and appropriate personal protective equipment

Behavior: The student will tie a three bight anchor sling

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- 5-foot length of 1-inch webbing
- Length of ½-inch tie rope
- Carabiner
- Anchor point
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 11

PREPARATION:

To complete most rescue systems, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Tie an overhand bend	1a. With the webbing b. Remove any twists c. Leaving a 2-inch tail d. To create a sling
2. Form a bight	2a. At one end of the sling
3. Pass the bight of the sling	3a. Around the anchor point
4. Bring the bight together	4a. Use the bight formed at the opposite end of the sling b. On the load side of the anchor c. Removing any slack in the sling
5. Position the overhand bend	5a. Between the bights at the load side and the anchor point
6. Attach a carabiner	6a. To the two bights formed as the web sling is pulled toward the load b. Bight down c. Flipping up
7. Tie a figure eight	7a. On a bight at the end of the tie rope b. Leaving a 6-inch tail
8. Attach the carabiner	8a. To the figure eight on a bight
9. Lock the carabiner	



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO TIE A MULTI-LOOP ANCHOR SLING

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: Webbing, tie rope, carabiner, anchor point, and appropriate personal protective equipment

Behavior: The student will tie a multi-loop anchor sling

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- 5-foot length of 1-inch webbing
- Length of ½-inch tie rope
- Carabiner
- Anchor point
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 11

PREPARATION:

To complete most rescue systems, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Pass the working end of the webbing	1a. Around the anchor point b. Three times
2. Tie an overhand bend	2a. In the webbing
3. Position and hold the overhand bend	3a. Against the anchor point
4. Pull two wraps of the webbing	4a. In the direction of the load b. Forming two bights c. Leaving the loop with the overhand bend against the anchor point
5. Attach a carabiner	5a. To the two bights formed as the web sling is pulled toward the load b. Biting down c. Flipping up
6. Tie a figure eight	6a. On a bight b. At the end of the tie rope c. Leaving a 6-inch tail
7. Attach the carabiner	7a. To the figure eight on a bight
8. Lock the carabiner	



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO TIE A FULL STRENGTH TIE OFF

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: Tie rope, carabiner, vertical anchor point, and appropriate personal protective equipment

Behavior: The student will tie a full strength tie off around an anchor point

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- Length of ½-inch tie rope
- Carabiner
- Vertical anchor point
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 11

PREPARATION:

To complete most rescue systems, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Tie a figure eight	1a. On a bight b. Working end of the rope c. Leaving a 6-inch bight
2. Grasp the rope	2a. By the standing part
3. Form an overhand loop	b. Leaving enough rope to wrap the anchor point three times and tie off working end
4. Form a second overhand loop	3a. Around the anchor point
5. Form a third overhand loop	b. With the working end c. As low as possible
6. Tie an overhand knot	4a. Around the anchor
7. Remove slack	b. Above the first loop c. With the working end
8. Wrap the working end of the rope	5a. Around the anchor
	b. With the working end c. Above the second loop
	6a. Around the standing part of the rope
	b. With the working end c. Next to the wraps around the anchor
	7a. Dress the wraps
	b. Keeping the standing part of the rope straight as it passes through the overhand knot c. No angle is formed in the standing part of the line
	8a. Around the anchor

FIRE FIGHTER II

OPERATIONS	KEY POINTS
9. Attach a carabiner	9a. To the figure eight on a bight b. Biting down c. Flipping up
10. Attach the carabiner	10a. To the standing part of the rope b. In front of the anchor c. Removing slack from the last wrap around the anchor
11. Lock the carabiner	



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO CONSTRUCT A BACK-TIED ANCHOR SYSTEM

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: Three lengths of webbing, tie rope, carabiners, anchor points, and appropriate personal protective equipment

Behavior: The student will construct a back-tied anchor system

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- 3 5-foot lengths of 1-inch webbing
- 2 lengths of ½-inch tie rope
- 3 carabiners
- 2 anchor points
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 11

PREPARATION:

To complete most rescue systems, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Tie a multi-wrap	1a. Around the anchor point b. Closest to the load c. Pulling the two bights on the anchor sling toward the load
2. Attach a carabiner	2a. To the anchor sling b. Biting down c. Flipping up
3. Tie a second multi-loop wrap anchor sling	3a. Around the anchor point b. Closest to the load c. Intertwining the webbing with the first anchor sling d. Pulling the two bights on the anchor sling toward the second anchor point
4. Attach a carabiner	4a. To the anchor sling b. Biting down c. Flipping up
5. Tie a third multi-loop anchor sling	5a. Around the second anchor point b. Farthest from the load c. Pulling the two bights on the anchor sling toward the first anchor point
6. Attach a carabiner	6a. To the anchor sling b. Biting down c. Flipping up
7. Tie a figure eight	7a. On a bight b. In the end of the rescue rope c. Leaving a 6-inch tail

FIRE FIGHTER II

OPERATIONS	KEY POINTS
8. Attach the figure eight on a bight	8a. To the carabiner on the anchor sling b. Around the second anchor point
9. Attach the standing part of the rescue rope	9a. To the carabiner on the anchor sling b. Around the first anchor point that faces the second anchor point c. Removing any slack
10. Attach the standing part of the rescue rope	10a. To the carabiner on the anchor sling b. On the second anchor point c. Remove any slack
11. Lock the carabiner	
12. Attach the standing part of the rescue rope	12a. To the carabiner b. On the anchor sling around the first anchor point that faces the second anchor point c. Removing any slack
13. Lock the carabiner	
14. Tension the rescue rope	14a. Between the anchor points
15. Tie off the rescue rope	15a. With two half hitches b. Keeping rope tensioned
16. Tie a figure eight	16a. On a bight b. On the end of the second rope c. Leaving a 8-10 inch tail
17. Attach the figure eight on a bight	17a. To the carabiner on the anchor sling b. Around the anchor point closest to the load
18. Lock the carabiner	

FIRE FIGHTER II

OPERATIONS	KEY POINTS
19. Retention the rope	19a. Between the two anchor points b. Prior to operating c. Removing any slack caused by stretch



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO CONSTRUCT A TWO-POINT SELF-ADJUSTING ANCHOR SYSTEM

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: Three lengths of webbing, tie rope, carabiners, anchor points, and appropriate personal protective equipment

Behavior: The student will construct a two-point self-adjusting anchor system

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- 3 5-foot lengths of 1-inch webbing
- 1 length of ½-inch tie rope
- 3 carabiners
- 2 anchor points
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 11

PREPARATION:

To complete most rescue systems, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Attach a multi-loop anchor	1a. Two both anchor points
2. Attach a carabiner	2a. To each anchor sling
	b. Biting down
	c. Flipping up
3. Tie an overhand bend	3a. In the webbing
	b. Leaving a 2-inch tail
	c. Creating a web sling
4. Attach the web sling	4a. To the carabiners
	b. On each anchor point
5. Lock the carabiners	
6. Grasp both strands of webbing	6a. Between the two carabiners
7. Pull the web sling	7a. Toward the load
8. Twist the rear leg of the web sling	8a. Forming a loop in the rear leg
9. Attach a carabiner	9a. To the web sling
	b. Biting down
	c. Flipping up
	d. Capturing the loop in the rear leg
	e. Capture the front leg
10. Tie a figure eight	10a. On a bight
	b. In the end of the tie rope
11. Attach a carabiner	11a. To the figure eight on a bight
12. Lock the carabiner	
13. Adjust overhand bend	13a. So that it lays between the carabiners



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO CONSTRUCT A THREE-POINT SELF-ADJUSTING ANCHOR SYSTEM

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: Three lengths of webbing, tie rope, rescue rope, carabiners, anchor points, and appropriate personal protective equipment

Behavior: The student will construct a three-point self-adjusting anchor system

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- 3 5-foot lengths of 1-inch webbing
- 1 12-foot length of 1-inch webbing
- 1 Length of ½-inch tie rope
- 3 rescue ropes
- 8 carabiners
- 3 anchor points
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 11

PREPARATION: To complete most rescue operations, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Attach a multi-loop anchor sling	1a. To each anchor point
2. Attach a carabiner	2a. To each multi-loop anchor sling b. Biting down c. Flipping up
3. Tie an overhand bend	3a. In the webbing b. 12-foot webbing c. Leaving 24-inch tails d. Creating a web sling
4. Identify the collection point	4a. For the self-adjusting anchor sling b. Load side of anchors c. Far enough away from the anchors to keep the included angle formed by the anchor sling less than 90°
5. Lay the self-adjusting anchor sling	5a. On the ground b. At the collection point
6. Tie a figure eight	6a. On a bight b. One end of the three rescue ropes c. Leaving 6-inch tails d. Creating tag lines
7. Attach the figure eight	7a. To the carabiners on the three slings b. One figure eight on a bight to each anchor sling
8. Lock the carabiner	
9. Lay the three tag lines	9a. At the collection point

FIRE FIGHTER II

OPERATIONS	KEY POINTS
10. Tie a figure eight	10a. On a bight b. In each of the three tag lines c. At the collection point
11. Attach a carabiner	11a. To each tag line b. Biting down c. Flipping up
12. Attach the self-adjusting anchor sling	12a. To the tag line carabiners b. Clipping the carabiners to the webbing.
13. Grasp the self-adjusting sling	13a. Between the carabiners b. Both hands
14. Pull the self-adjusting anchor sling	14a. Toward the load b. Creating a front leg (load side) and two rear legs (between the tag line carabiners)
15. Attach a carabiner	15a. To each of the two bights formed by the legs of the sling b. Biting down c. Flipping up d. Pulling the carabiners together e. Side by side
16. Tie a figure eight	16a. On a bight b. In the end of the tie rope c. Leaving a 6-inch tail

FIRE FIGHTER II

OPERATIONS	KEY POINTS
17. Attach the two carabiners	17a. Onto the self-adjusting anchor sling to the figure eight on a bight b. Biting down c. Flipping up
18. Lock the carabiner	
19. Adjust overhand bend	19a. So that it lays between the carabiners on the outside leg



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: INTRODUCTION TO THE BELAY SYSTEM

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the belay system by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 15

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials
- Anchor sling
- Mariner's hitch
- Prusik minding pulley
- Short prusik loop
- Long prusik loop
- Rescue rope
- Carabiners
- Pelvic harness
- Chest harness
- Anchor point

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition

PREPARATION:

The proper use of rope in rescue operations involves belaying in a two-line system, one rope raises or lowers the load while a second rope belays or provides safety. The advantage of having two ropes in a rescue operation is that only one rope has to be under load. This allows the belay line to be used as a backup, without supporting the stress of the load and providing a "safety net" for fire fighters and victims.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. DEFINED</p> <p>A. The proper use of rope in rescue operations involves belaying</p> <p>B. In the rescue community, the term belay means providing security with a rope</p> <p>C. A belay system is a separate rope system that provides protection against a fall or failure of the main rope system</p> <p>D. Two line system</p> <ol style="list-style-type: none"> 1. One rope raises or lowers the load 2. Second rope belays or provides safety 3. The advantage of having two ropes in a rescue operation is that only one rope has to be under load <ol style="list-style-type: none"> a) This allows the belay line to be used as a backup, without supporting the stress of the load b) The belay line should be attached to a separate anchor point to give added security in case of failure to the main line anchor point <p>II. COMPONENTS</p> <p>A. With a separate anchor point unless an absolute bomb proof anchor is being used</p> <p>B. A mariner's hitch is attached to the anchor sling with a prusik minding pulley and the brake prusiks on the opposite end</p> <p>C. With two prusik loops of unequal length, 57 and 70 inches are suggested, attached to the belay line with three wrap hitches to form a tandem prusik brake</p>	<p>What is a belay system?</p> <p>How many lines in a belay system?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>D. A prusik minding pulley is placed on the belay line behind the tandem prusik brake during a raising belay only</p> <p>E. A single, separate belay line that backs up the main line in case there is a failure to the main line or the rescuer falls</p> <p>F. With a separate person managing the brake on the belay system</p>	<p>Who manages the brake on the belay system?</p>
<p>III. OPERATION</p> <p>A. Coordination between belayer and rescuer</p> <ol style="list-style-type: none"> 1. Rescuer must be attached to the belay system prior to being attached to the main line 2. Communicate with the belayer <ol style="list-style-type: none"> a) "BELAY ON?" <ol style="list-style-type: none"> 1) Questions the readiness of the belayer 3. The belayer responds <ol style="list-style-type: none"> a) "ON BELAY" <ol style="list-style-type: none"> 1) When ready to belay the rescuer <p>B. When the rescuer begins the descent or ascent, the belayer begins paying out or taking up line by pulling the rope in one direction or the other through the brake prusiks</p>	<p>Which system should the rescuer attach to first?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ol style="list-style-type: none">1. The belayer maintains a small amount of slack until a failure or fall occurs and the braking cam catches the load2. Remember the greater the amount of slack, the longer the fall and the more severe the shock load on the system <p>C. The operation is continued until the rescuer reaches their destination</p>	<p>Should the belayer limit the amount of slack in the belay line?</p>



FIRE FIGHTER II

SUMMARY:

The use of a belay line in any lowering or raising system is crucial in providing safety for the rescuer or the victim. Belay systems must be built separate from the hauling system and several pieces of rescue equipment are needed. The effectiveness of any belay system relies on good communication between the rescuers.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 15 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: HOW TO CONSTRUCT AND OPERATE A BELAY SYSTEM

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: An anchor sling, mariner's hitch, prusik minding pulley, short prusik loop, long prusik loop, rescue rope, anchor point, and appropriate personal protective equipment

Behavior: The student will construct and operate a belay system

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- 1 anchor sling
- 1 mariner's hitch
- 1 prusik minding pulley
- 1 short prusik loop
- 1 long prusik loop
- 1 rescue rope
- 1 anchor point
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 15

PREPARATION:

To complete most rescue operations, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Attach the second carabiner	1a. On the mariner's hitch b. To the anchor point
2. Lock the carabiner	
3. Place the belay line	3a. Near the anchor point
4. Tie a figure eight	4a. On a bight b. Forming a 10-inch bight c. Leaving a 6-inch tail
5. Attach short prusik loop	5a. To the running end of the belay line b. 3-wrap prusik hitch
6. Attach long prusik loop	6a. In front of the short prusik loop b. On the belay line c. 3-wrap prusik d. Between short prusik and the load
7. Attach tandem prusiks	7a. To first carabiners on mariner's hitch b. Long prusik loop first c. Short prusik loop second
8. Lock the carabiner	
9. Attach figure eight on a bight	9a. To the rescuer's pelvic and chest harnesses
10. Lower belay	
11. Grasp prusik hitches	11a. Keeping hitches slightly loose on the line

FIRE FIGHTER II

OPERATIONS	KEY POINTS
12. Pay belay line out	12a. Between the prusik hitches and the load b. With other hand c. One full arms length at a time d. Bending belay line to 90° in the hand
13. Repeat Operation 10	13a. As needed b. When tension from the load begins to straighten the belay line in the hand
14. Maintain slight droop in belay line	14a. Throughout the lowering sequence
15. Maintain slight droop	15a. In mariner's hitch b. Helping to prevent prusik hitches from setting on the belay line
16. Raise belay	
17. Grasp prusik hitches	17a. Keeping hitches slightly loose on the line
18. Pull belay line	18a. Through prusik hitches b. With other hand c. Between the prusik hitches and the anchor
19. Remove slack	19a. As rescuer or victim ascends
20. Raise belay with prusik minding pulley	
21. Place prusik minding pulley	21a. On belay line b. Behind tandem prusiks
22. Attach prusik minding pulley	22a. To first carabiner on mariner's hitch b. On top of tandem prusiks
23. Lock the carabiner	

FIRE FIGHTER II

OPERATIONS	KEY POINTS
24. Pull belay line	24a. Through prusik minding pulley b. 180° change of direction c. Ensuring the prusik minding pulley tends prusik hitches on leading edge of pulley
25. Remove slack	25a. As rescuer or victim ascends



APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: INTRODUCTION TO THE RACK, PULLEY, AND MARINER'S HITCH (RPM)

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the rack, pulley, and mariner's hitch (RPM) by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 14

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition

PREPARATION: The key to performing successful rope rescue operations is the knowledge and skills necessary to operate rope rescue equipment in a safe and efficient manner. The rack, pulley, mariner's hitch (RPM) is a necessary part of this equipment and is used in many of the rope rescue systems taught in this course. You must understand the RPM in order to be an effective part of the rescue team.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. RPM DEFINED</p> <p>A. Rack, pulley, mariner's hitch</p> <p>B. The RPM is a device used to manage the main line at the anchor point on simple rope rescue lowering and raising systems</p> <ol style="list-style-type: none"> 1. Also used to make the changeover from lowering to raising and raising to lowering 2. Includes a package of all the equipment attached to the anchor point <p>II. COMPONENTS</p> <p>A. Anchor plate</p> <ol style="list-style-type: none"> 1. One large hole 2. Four small holes <p>B. Brake bar rack or figure eight descender</p> <ol style="list-style-type: none"> 1. Used as a lowering device 2. Attached to the left-hand small hole in the anchor plate with a carabiner <p>C. Mariner's hitch</p> <ol style="list-style-type: none"> 1. Load releasing device 2. Attached to the right-hand small hole in the anchor plate 3. Includes three carabiners as part of the hitch to attach the <ol style="list-style-type: none"> a) Anchor plate b) Directional change pulley c) Ratchet prusik 	<p>What does RPM stand for?</p> <p>What does the RPM do?</p>



FIRE FIGHTER II

SUMMARY:

The RPM is a key component of a basic rope rescue system. It provides most of the equipment necessary to build and operate a lowering and raising system (Z-rig). This package of equipment, when utilized in an efficient manner can make these systems simpler and safer to build and operate.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 14 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: HOW TO ATTACH A PRUSIK LOOP TO A RPM FOR USE AS A RATCHET DEVICE IN A HAUL SYSTEM

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: An anchor sling, rescue rope, anchor plate, mariner's hitch with carabiners, short prusik loop, prusik minding pulley, carabiners, anchor point, and appropriate personal protective equipment

Behavior: The student will attach a prusik loop to a RPM for use as a ratchet device in a haul system

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- 1 anchor sling
- 1 rescue rope
- 1 anchor plate
- 1 mariner's hitch
- 1 short prusik loop
- 1 prusik minding pulley
- 2 carabiners
- 1 anchor point
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 14

PREPARATION: To complete most rescue operations, a few basic skills must be mastered. The use of the RPM provides a greater margin of safety for the rescuers and victims and saves precious time when building rescue systems.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Attach a carabiner	1a. To anchor sling b. Biting down c. Flipping up
2. Attach anchor plate	2a. To carabiner b. Large hole in anchor plate
3. Lock carabiner	
4. Attach mariner's hitch	4a. To anchor plate b. Second carabiner
5. Attach short prusik loop	5a. To rescue rope b. 3-wrap prusik hitch
6. Attach short prusik loop	6a. To first carabiner b. On mariner's hitch
7. Attach prusik minding pulley	7a. To working end of rescue rope b. Twisting side plates to open pulley
8. Attach first carabiner on mariner's hitch	8a. To prusik minding pulley
9. Lock carabiner	
<p>NOTE: Have a student pull on the end of the rescue rope to create tension on the system.</p>	



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

- TOPIC:** HOW TO ATTACH A THREE-WRAP PRUSIK HITCH TO A RESCUE ROPE
- TIME FRAME:** 0:15
- LEVEL OF INSTRUCTION:** Level II
- AUTHORITY:** SBFS
- BEHAVIORAL OBJECTIVE:**
- Condition:** A prusik loop, tie rope, and appropriate personal protective equipment
- Behavior:** The student will attach a three-wrap prusik hitch to a rescue rope
- Standard:** Completing all operations within _____ according to the job breakdown
- MATERIALS NEEDED:**
- Job breakdown
 - Prusik loop
 - Length of ½-inch tie rope
 - Appropriate personal protective equipment
- REFERENCES:**
- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 10
- PREPARATION:** To complete most rescue systems, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Position the prusik	1a. In the dominant hand b. Double overhand bend in hand c. Next to the rescue rope
2. Wrap prusik loop	2a. Around the rescue rope b. Three times c. Using double overhand bend d. Insert through bight
3. Dress the hitch	3a. Pulling from one side of the double overhand bend b. Until all wraps are uniform around the rescue rope c. First wrap on the exterior d. Last wrap on the interior e. Double overhand bend is between the wraps on rescue rope f. Bight in prusik loop



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO ATTACH AND OPERATE A FIGURE EIGHT DESCENDER AS PART OF A RPM

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A figure eight descender, anchor plate, anchor sling, rescue rope, carabiners, anchor point, and appropriate personal protective equipment

Behavior: The student will attach and operate a figure eight descender as part of a RPM

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- 1 figure eight descender
- 1 anchor plate
- 1 anchor sling
- 1 rescue rope
- 2 carabiners
- 1 anchor point
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 14

PREPARATION:

To complete most rescue operations, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Attach carabiner	1a. To anchor sling b. Biting down c. Flipping up
2. Attach anchor plate	2a. To carabiner b. Large hole in anchor plate
3. Lock carabiner	
4. Attach carabiner	4a. To anchor plate b. Small hole on left c. Biting down d. Flipping up
5. Form a bight	5a. In running end of lowering line
6. Pass bight	6a. Through large hole in figure eight descender b. From underneath figure eight descender
7. Pull bight	7a. Over small end of figure eight descender
8. Attach figure eight descender	8a. To carabiner b. Small hole in figure eight descender
9. Lock carabiner	
10. Hold running end of lowering line	10a. With both hands
11. Pull running end of lowering line	11a. Towards anchor b. Brake position c. Greatest friction

FIRE FIGHTER II

OPERATIONS		KEY POINTS	
12.	Move running end of lowering line	12a.	Towards load
		b.	Until reaching desired resistance
		c.	Gradually
		d.	To begin descent
13.	Bring running end of lowering line up	13a.	To standing part
		b.	In front of figure eight descender
		c.	Using one hand
14.	Hold junction of figure eight descender and carabiner	14a.	Using other hand
		b.	Prevents twisting
15.	Wrap running end of lowering line	15a.	Between figure eight descender and standing part
16.	Wrap running end of lowering line	16a.	Around two ears on figure eight descender
17.	Repeat Operations 15 and 16	17a.	Twice
18.	Bring running end of lowering line up	18a.	To standing part
19.	Tie overhand on bight	19a.	Around standing part
		b.	To lock off



APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO ATTACH A GIBBS ASCENDER TO A RPM FOR USE AS A RATCHET DEVICE IN A HAUL SYSTEM

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: An anchor sling, rescue rope, anchor plate, mariner's hitch with carabiners, Gibbs ascender, prusik minding pulley, carabiners, anchor point, and appropriate personal protective equipment

Behavior: The student will attach a Gibbs ascender to a RPM for use as a ratchet device in a haul system

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- 1 anchor sling
- 1 rescue rope
- 1 anchor plate
- 1 mariner's hitch
- 1 5-foot length of 1-inch webbing
- 1 Gibbs ascender
- 1 prusik minding pulley
- 2 carabiners
- 1 anchor point
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 14

PREPARATION:

To complete most rescue operations, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Attach carabiner	1a. To anchor sling b. Biting down c. Flipping up
2. Attach anchor plate	2a. To carabiner b. Large hole in anchor plate
3. Lock carabiner	
4. Attach mariner's hitch	4a. To anchor plate b. Second carabiner
5. Tie a sling	5a. In 5-foot length of webbing
6. Thread bight	6a. In web sling b. Through eye of ascender
7. Attach two bights	7a. In web sling b. To carabiner on end of mariner's hitch
8. Lock carabiner	
9. Remove pin and cam	9a. From shell of Gibbs ascender
10. Place working end of rescue rope	10a. In shell of Gibbs ascender b. Arrow on shell towards load
11. Replace pin and cam	
12. Attach prusik minding pulley	12a. To working end of rescue rope b. Twisting side plates to open pulley
13. Attach first carabiner on mariner's hitch	13a. To prusik minding pulley
14. Lock carabiner	
NOTE: Have a student pull on the end of the rescue rope to create tension on the system.	



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO ATTACH AND OPERATE A BRAKE BAR RACK AS PART OF A RPM

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A brake bar rack, anchor plate, anchor sling, rescue rope, carabiners, anchor point, and appropriate personal protective equipment

Behavior: The student will attach and operate a brake bar rack as part of a RPM

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- 1 brake bar rack
- 1 anchor plate
- 1 anchor sling
- 1 rescue rope
- 2 carabiners
- 1 anchor point
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 14
- Rope Rescue Manual, California Mountain Company, Third Edition, Pages 128-130

PREPARATION:

To complete most rescue operations, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Attach carabiner	1a. To anchor sling b. Biting down c. Flipping up
2. Attach anchor plate	2a. To carabiner b. Large hole in anchor plate
3. Lock carabiner	
4. Attach carabiner	4a. To anchor plate b. Small hole on left c. Biting down d. Flipping up
5. Attach brake bar rack	5a. To carabiner b. Training groove up c. ¾-inch bars released
6. Lock carabiner	
7. Pass running end of lowering line	7a. Over training groove
8. Position second bar	8a. With straight slot against the rack
9. Pass running end of lowering line	9a. Under second bar
10. Position third bar	10a. Against rack
11. Pass running end of lowering line	11a. Over third bar
12. Position fourth bar	12a. Against rack
13. Pass running end of lowering line	13a. Under fourth bar
NOTE: Start with four bars minimum for single person load	
14. Cradle bars	14a. In control hand
15. Hold running end of lowering	15a. Line in braking hand

FIRE FIGHTER II

OPERATIONS		KEY POINTS	
16.	Bring running end of lowering line up	16a.	To standing part
		b.	In front of brake bar rack
		c.	With braking hand
17.	Move braking hand	17a.	Away from standing part
		b.	To begin the descent
18.	Spread bars apart	18a.	With control hand
		b.	To increase speed of descent
19.	Move bars together	19a.	Towards front of rack
		b.	With control hand
		c.	To decrease speed of descent
20.	Bring running end of lowering line up	20a.	To standing part
		b.	In front of brake bar rack
		c.	With braking hand
		d.	To stop descent
21.	Position fifth bar	21a.	Against rack
		b.	With control hand
22.	Cradle bars	22a.	In control hand
23.	Pass running end of lowering line	23a.	Over fifth bar
		b.	For heavier loads requiring more friction
24.	Raise lowering line	24a.	Off fifth bar
25.	Bring running end of lowering line up	25a.	To standing part
		b.	In front of brake bar rack
		c.	With braking hand
		d.	To stop descent

FIRE FIGHTER II

OPERATIONS	KEY POINTS
26. Release fifth bar	26a. From rack b. With control hand
27. Cradle bars	27a. In control hand
28. Move braking hand	28a. Away from standing part b. To begin the descent
29. Bring running end of lowering line up	29a. To standing part b. In front of brake bar rack c. With braking hand d. To stop descent
30. Wrap running end of lowering line	30a. Between front of rack and standing part b. With braking hand
31. Wrap running end of lowering line	31a. Between two legs of rack b. Capturing fourth bar
32. Repeat Operations 30 and 31	
33. Bring running end of lowering line up	33a. To standing part
34. Tie overhand on a bight	34a. Around standing part b. To lock off



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO CONSTRUCT AND OPERATE A MARINER'S HITCH AS PART OF A RPM

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: An anchor sling, webbing, rescue rope, prusik loop, carabiners, anchor point, and appropriate personal protective equipment

Behavior: The student will construct and operate a mariner's hitch as part of a RPM

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- 1 anchor sling
- 1 12-foot length of 1-inch webbing
- 1 20-foot length of 1-inch webbing
- 1 rescue rope
- 1 prusik loop
- 4 carabiners
- 1 anchor point
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 14

PREPARATION:

To complete most rescue operations, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Attach carabiner	1a. To anchor sling b. Biting down c. Flipping up
2. Attach anchor plate	2a. To carabiner b. Large hole in anchor plate
3. Lock carabiner	
4. Fold a 12-foot piece of webbing	4a. In half b. Ends aligned c. No twists
5. Tie an overhand bend	5a. In ends of webbing b. Leaving a 2-inch tails
6. Attach carabiner	6a. To bight opposite knot b. Biting down c. Flipping up
7. Attach carabiner	7a. Over both strands of webbing b. 12 inches from first carabiner
8. Pass overhand bend	8a. Through first carabiner at bight
9. Wrap working end of webbing	9a. Around strands between carabiners b. Wraps touching c. 5 wraps
10. Form a bight	10a. In working end of webbing b. Using both strands
11. Pass bight	11a. Between pairs of strands just above second carabiner

FIRE FIGHTER II

OPERATIONS	KEY POINTS
12. Attach carabiner	12a. To bight b. Between strands of webbing at overhand bend
13. Lock carabiner	
14. Attach second carabiner on mariner's hitch	14a. To anchor plate b. Small hole on right
15. Lock carabiner	
16. Attach prusik loop	16a. To rescue rope b. Three wrap prusik hitch
17. Attach prusik loop	17a. To mariner's hitch b. At first carabiner
18. Lock the carabiner	
NOTE: To simulate the load, have a student pull on the end of the rescue rope to create tension on the system while the mariner's hitch is released.	
19. Release third carabiner	19a. From webbing on mariner's hitch
20. Pull on overhand	20a. Bend to release bight from mariner's hitch
21. Begin to unwrap webbing	21a. Slowly
22. Release tension	22a. On system b. Slowly c. Until load is transferred to newly secured place on rope



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: INTRODUCTION TO ROPE RESCUE LOWERING AND RAISING SYSTEMS

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the construction and operation of basic rope rescue lowering and raising systems by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 17

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition

PREPARATION: During disaster rescue operations, there will be victims who must be raised and lowered from areas of entrapment to the level of rescuers. One option available to rescuers is the rope rescue raising system. With the proper equipment, raising and lowering can be accomplished in a short period of time.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. ROPE RESCUE SYSTEMS DEFINED</p> <p>A. Lowering system</p> <ol style="list-style-type: none"> 1. Lowers victims and rescuers from a higher place to a lower level in order to accomplish removal <p>B. Raising system</p> <ol style="list-style-type: none"> 1. A rope rescue system is used to raise victims and rescuers from a lower level to a higher level in order to accomplish removal 	<p>What is a rope rescue lowering system used for?</p> <p>What is a rope rescue raising system used for?</p>
<p>II. LOWERING SYSTEM</p> <p>A. Components</p> <ol style="list-style-type: none"> 1. Anchor system <ol style="list-style-type: none"> a) One anchor for the main line b) Selected for its strength and location <ol style="list-style-type: none"> 1) Strong enough to support the load and any additional dynamic forces created by a system failure 2) Main line anchor should be adjacent to the belay anchor to keep the main and belay lines parallel and close together <ul style="list-style-type: none"> • Makes communications easier 3) Close access to the load and room to haul on the system 	<p>What are the components of a rope rescue lowering system?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>c) An anchor sling is attached to the main line anchor</p> <p>2. Main line</p> <p>a) A rack, pulley mariners hitch (RPM) is attached to the anchor sling with a carabiner</p> <p>b) Main line is attached to a brake bar rack or figure eight descender</p> <p>c) A directional change pulley is attached to the main line near the edge</p> <p>1) This pulley should be attached to an anchor that is high enough to facilitate raising the rescuer/victim over the edge without difficulty in clearing the edge</p> <p>d) A figure eight on a bight is tied in the working end of the main line</p> <p>e) The rescuer/victim's harness is attached to the figure eight on a bight</p> <p>f) Slack is removed from the main line between the brake bar rack/figure eight descender and the rescuer/victim</p> <p>1) Rescuer/victim is ready to lower</p>	<p>How is the main line attached?</p> <p>Why is it desirable to have a high directional change in the main line at a location near the edge?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>B. Operation</p> <ol style="list-style-type: none"> 1. Crew assignments <ol style="list-style-type: none"> a) Edge person <ol style="list-style-type: none"> 1) Coordinates the operation 2) Gives orders <ul style="list-style-type: none"> • Lowering line tender • Belay • Rescuer/victim b) Lowering line tender <ol style="list-style-type: none"> 1) Manages the main line to lower the rescuer/victim c) Belay <ol style="list-style-type: none"> 1) Manages the belay system 2. Safety checks <ol style="list-style-type: none"> a) Prior to operation of the system <ol style="list-style-type: none"> 1) All anchor components 2) All belay systems components 3) All main line components 4) Rescuer/victim packaging b) Ensures that all parts of the system are properly assembled, tied, and secured 	<p>What crew assignments would you make for a rope rescue system?</p> <p>What task/s would a lowering line tender perform?</p> <p>What safety checks need to be performed?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>c) Performed by a member of the crew who has not constructed that component</p> <p>3. Commands</p> <p>a) Designed to</p> <ol style="list-style-type: none"> 1) Coordinate the operation 2) Ensure consistent communications 3) Ensure instant response in the event of an emergency <p>b) Readiness check commands</p> <ol style="list-style-type: none"> 1) Edge person to the belayer <ul style="list-style-type: none"> • "ON BELAY?" 2) When ready, belayer to edge person <ul style="list-style-type: none"> • "BELAY ON!" 3) Edge person to lowering line tender <ul style="list-style-type: none"> • "READY ON MAIN LINE?" 4) When ready, lowering line tender to edge person <ul style="list-style-type: none"> • "MAIN LINE READY!" 5) Edge person to the rescuer/victim <ul style="list-style-type: none"> • "RESCUER/VICTIM READY?" 6) When ready, rescuer/victim to edge person <ul style="list-style-type: none"> • "READY!" <p>c) Operation commands</p> <ol style="list-style-type: none"> 1) Edge person to lowering line tender <ul style="list-style-type: none"> • "DOWN!" 	<p>Why are specific commands necessary to the operation of a lowering system?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> • To increase the lowering speed, the edge person calls out, "DOWN, DOWN!" • To stop the operation, the edge person calls out, "STOP!" <ol style="list-style-type: none"> 2) Any member of the crew who needs to stop the operation may call out, "STOP!" <ol style="list-style-type: none"> 4. To disconnect rescuer/victim <ol style="list-style-type: none"> a) Provide slack <ol style="list-style-type: none"> 1) Main line 2) Belay line 5. When lowering is complete the brake bar rack/figure eight descender is locked off and the main line is prepared for raising <p>III. CHANGEOVER FROM LOWERING TO RAISING</p> <p>A. Components for a Z-rig</p> <ol style="list-style-type: none"> 1. Ratchet prusik <ol style="list-style-type: none"> a) Holds the load while the raising system is reset 2. Directional change pulley <ol style="list-style-type: none"> a) Stationary pulley that changes the direction of haul 3. Mechanical advantage pulley <ol style="list-style-type: none"> a) Moving pulley that creates mechanical advantage in the raising system 	<p>Can anyone identify the components of a Z-rig?</p> <p>What is a mechanical advantage pulley?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ol style="list-style-type: none"> 2) Gives orders <ul style="list-style-type: none"> • Haul team leader • Belayer • Rescuer/victim b) Haul team leader <ol style="list-style-type: none"> 1) Directs the haul team on the main line to raise the rescuer/victim c) Belayer <ol style="list-style-type: none"> 1) Manages the belay system 2. Safety checks <ol style="list-style-type: none"> a) Prior to operation of the system <ol style="list-style-type: none"> 1) All anchor components 2) All belay systems components 3) All main line components 4) Rescuer/victim packaging b) Ensures that all parts of the system are properly assembled, tied, and secured c) Performed by a member of the crew who has not constructed that component 3. Commands <ol style="list-style-type: none"> a) Designed to <ol style="list-style-type: none"> 1) Coordinate the operation 2) Ensure consistent communications 3) Ensure instant response in the event of an emergency 	<p>Who performs the safety checks?</p> <p>Why are specific commands necessary to the operation of a raising system?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> • To stop the operation, the edge person calls out, "STOP!" <ol style="list-style-type: none"> 2) When the haul team has raised the system to the point where the mechanical advantage pulley (moving pulley) on the main line is close to the RPM, haul team leader calls out, "SET!" 3) After the haul team has set the ratchet prusik, haul team leader calls out "RESET!" <ul style="list-style-type: none"> • A haul team member resets the mechanical advantage pulley • Process repeated as necessary 4) Any member of the crew who needs to stop the operation may call out, "STOP!" <ol style="list-style-type: none"> 4. To disconnect rescuer/victim <ol style="list-style-type: none"> a) Provide slack <ol style="list-style-type: none"> 1) Main line <ul style="list-style-type: none"> • Release ratchet prusik 2) Belay line 	<p>What command will stop the entire operation?</p> <p>Who can give the "STOP!" command?</p>



FIRE FIGHTER II

SUMMARY:

The rope rescue raising system is one of the building blocks of rope rescue. A fundamental technique must be mastered in order to operate proficiently and minimize the risk of injury to rescuers and victims. The keys to success are the use of consistent commands, communications, teamwork, and a comprehensive safety check before operation of the system.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 17 in order to prepare for the upcoming test. Study for the next session.

TOPIC: HOW TO CONSTRUCT AND OPERATE A LOWERING SYSTEM

TIME FRAME: 0:45

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A belay system, RPM, commercial rescue harness, webbing, rescue rope, anchor slings, pulley, carabiners, edge protection, suitable facility with a high anchor point, and appropriate personal protective equipment

Behavior: The student will construct and operate a lowering system

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- Belay system
- RPM
- Commercial rescue harness
- 12-foot length of 1-inch webbing
- Rescue rope
- 2 anchor slings
- Pulley
- 3 carabiners
- Edge protection
- Suitable facility with a high anchor point
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 17

PREPARATION:

To complete most rescue operations, a few basic skills must be mastered. A lowering system provides the rescuer with a "hands-free" method of getting down otherwise difficult terrain.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Form a multi-loop anchor sling	1a. Around anchor point
2. Attach RPM	2a. To anchor sling
3. Lock carabiner	
4. Tie a figure eight on a bight	4a. In working end of rescue rope
	b. Forming a 4-6 inch bight
5. Position working end of rescue rope	5a. Near point of departure
6. Form multi-loop anchor sling	6a. Around high anchor point
	b. Near point of departure
7. Attach carabiner	7a. To anchor sling
	b. Biting down
	c. Flipping up
8. Attach directional change pulley	8a. To main line
	b. Near working end
9. Attach pulley	9a. To carabiner on anchor sling
10. Lock carabiner	
11. Reeve the running end of rescue rope	11a. Through brake bar rack
	b. Minimum 4 bars
12. Remove any slack	12a. In rescue rope
	b. Between rack and working end of line
13. Lock off rescue rope	13a. On brake bar rack
14. Assemble belay system	
15. Package rescuer/victim	15a. Chest harness
	b. Pelvic harness
16. Attach the working end of belay line	16a. To chest and pelvic harnesses

FIRE FIGHTER II

OPERATIONS	KEY POINTS
17. Attach working end of main line	17a. To pelvic harness
18. Lock carabiners	
19. Place edge protection	19a. Under main line b. Under belay line
20. Perform safety checks	20a. All anchor components b. All belay systems components c. All main line components d. Rescuer/victim packaging
21. Give command	21a. "ON BELAY?" b. To ensure belayer is ready
22. Wait for response	22A. "BELAY ON!"
23. Position rescuer/victim	23a. At edge b. Facing anchor point
24. Give command	24a. "READY ON MAIN LINE?"
25. Wait for response	25a. "MAIN LINE READY!"
26. Give command	26a. "RESCUER/VICTIM READY?"
27. Wait for response	27a. "READY!"
28. Give command	28a. "DOWN!"
29. Lower rescuer/victim	29a. In a controlled manner b. By lowering line tender
30. Belayer manages belay line	
31. Give command	31a. "STOP!" b. When rescuer/victim has reached desired location c. By edge person

FIRE FIGHTER II

OPERATIONS	KEY POINTS
32. Provide slack	32a. Main line b. Belay line
33. Give command	33a. "OFF BELAY!"



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: MECHANICAL ADVANTAGE SYSTEMS USING THE 3:1 PIGGY BACK AND 3:1 Z-RIG, INCLUDING DIRECTIONAL CHANGES

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level I

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the types of rope rescue pulley systems, how to select the appropriate system for use, and how to determine the mechanical advantage of the system selected by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 17

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual material

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition

PREPARATION: During rope rescue operations, pulley systems are used to gain the mechanical advantage necessary to move rescuers and victims and accomplish the rescue. Rescuers need to understand the technical aspects of pulley systems in order to select the most efficient and appropriate system when performing a rope rescue.

PRESENTATION	APPLICATION
<p>I. TYPES OF PULLEY SYSTEMS</p> <p>A. There are two types of pulley systems used in fire service rope rescue</p> <ol style="list-style-type: none"> 1. Simple systems 2. Compound systems <p>B. Simple pulley systems follow a few basic rules</p> <ol style="list-style-type: none"> 1. All the pulleys are attached to either the anchor or the load <ol style="list-style-type: none"> a) This may not be obvious because a rope may extend from a pulley to the anchor or load as in a Z-rig 2. The pulleys that are attached to the anchor remain stationary and only change the direction of the rope <ol style="list-style-type: none"> a) Referred to as "directional change pulleys" b) Referred to as "mechanical advantage pulleys" <p>C. Compound pulley systems are created by pulling on one simple pulley system with another simple pulley system</p>	<p>How many types of pulley systems are used in rope rescue?</p> <p>How can you identify a simple pulley system?</p> <p>How can you identify a compound pulley system?</p>

PRESENTATION	APPLICATION
<p>II. MECHANICAL ADVANTAGE</p> <p>A. Mechanical advantage is gained by spreading the work over a greater length</p> <ol style="list-style-type: none">1. When mechanical advantage exists, the length of rope that is moved by the rescuers pulling on the system is greater than the distance the system moves the load2. This is expressed as a ratio, 2:1, 3:1, etc. <p>B. Can be determined by measuring the difference between the amount of rope that is moved at the running end versus the distance the load moves</p> <ol style="list-style-type: none">1. This is an impractical method of determining mechanical advantage in the field <p>C. Actual mechanical advantage versus theoretical mechanical advantage</p> <ol style="list-style-type: none">1. Actual mechanical advantage is the mechanical advantage gained by the difference in rope movement versus load movement less any inefficiency in the system<ol style="list-style-type: none">a) Inefficiency in a pulley<ol style="list-style-type: none">1) A result of friction between the sheave and the axle and the tightness of bend in the rope created by sheave diameter	<p>What is meant by mechanical advantage in a pulley system?</p> <p>What are the two types of mechanical advantage in a pulley system?</p> <p>What is the difference between the two?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p style="text-align: center;">2) Friction caused by sections of the rope rubbing together between the pulleys</p> <p>2. Theoretical mechanical advantage is the mechanical advantage gained by the difference in rope movement versus load movement</p> <p>NOTE: In this class, mechanical advantage will be expressed in ideal terms.</p> <p>D. Theoretical method of determining mechanical advantage in a simple pulley system</p> <ol style="list-style-type: none"> 1. All the pulleys must be attached to either the anchor or the load 2. Count the number of lines, between the pulleys, supporting the load <ol style="list-style-type: none"> a) If the running end of the rope goes through a directional change pulley, do not count the running end of the rope as a line b) If the running end of the rope goes through a mechanical advantage pulley, count the running end of the rope as a line 3. The sum of the lines supporting the load equals the mechanical advantage 4. If the working end of the rope is attached to the anchor, the mechanical advantage is always an even number: 2:1, 4:1, etc. 5. If the working end of the rope is attached to the load, the mechanical advantage is always an odd number: 3:1, 5:1, etc. 	<p>How can you determine the mechanical advantage in a simple pulley system?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>a) There may be a rope extension between the mechanical advantage pulley(s) and the load</p> <p>E. Determining the mechanical advantage of a compound pulley system</p> <ol style="list-style-type: none"> 1. Separate the compound system into two or more simple systems 2. Determine the mechanical advantage in each of the simple systems 3. Multiply the mechanical advantage of the simple systems to determine the mechanical advantage of the compound system 	<p>How can you determine the mechanical advantage in a compound pulley system?</p>
<p>III. PULLEY SYSTEMS</p> <p>A. 3:1 piggy back</p> <ol style="list-style-type: none"> 1. Ladder rig turned upside down 2. Same equipment with the addition of a prusik loop to attach pulley system to a haul line <p>B. 3:1 Z-rig</p> <ol style="list-style-type: none"> 1. Simple in-line pulley system <ol style="list-style-type: none"> a) One pulley b) One prusik minding pulley c) Two carabiners d) One short prusik loop e) One long prusik loop 	<p>What kinds of pulley system will you use as a fire fighter?</p>



FIRE FIGHTER II

SUMMARY:

Pulley systems provide the mechanical advantage necessary to assist rescuers in the process of raising a load with a rope rescue system. Understanding the principles of pulley systems and mechanical advantage will help rescuers who are rigging and operating rope systems to provide the most efficient system to accomplish their objective.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 17 in order to prepare for the upcoming test. Study for the next session.

TOPIC: HOW TO CONSTRUCT A Z-RIG RAISING SYSTEM

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A belay system, RPM, commercial rescue harness, webbing, rescue rope, anchor slings, pulley, carabiners, edge protection, simulated load, suitable facility with a high anchor point, and appropriate personal protective equipment

Behavior: The student will construct and operate a z-rig raising system to raise an ambulatory victim

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- Belay system
- RPM
- Commercial rescue harness
- 12-inch length of 1-inch webbing
- Rescue rope
- 2 anchor slings
- Pulley
- 2 carabiners
- Edge protection
- Simulated load
- Suitable facility with a high anchor point
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000 Edition, Chapter 17

PREPARATION:

To complete most rescue operations, a few basic skills must be mastered. Using a Z-rig raising system allows fewer rescuers to perform more work.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Form a multi-loop anchor sling	1a. Around anchor point
2. Attach RPM	2a. To anchor sling
3. Lock carabiner	
4. Tie figure eight on a bight	4a. In working end of the rope
	b. Forming a 4-6 inch bight
5. Position the working end of the rescue rope	5a. Near point of departure
6. Form multi-loop anchor sling	6a. Around high anchor point
	b. Near point of departure
7. Attach carabiner	7a. To anchor sling
	b. Biting down
	c. Flipping up
8. Attach directional change pulley	8a. To main line
	b. Near working end
9. Attach pulley	9a. To carabiner on anchor sling
10. Lock the carabiner	
11. Attach the short prusik loop	11a. 3-wrap hitch
	b. To running end of main line
12. Attach short prusik loop	12a. To carabiner at end of mariner's hitch
13. Attach prusik-minding pulley	13a. To carabiner at end of mariner's hitch
14. Slide pulley with prusik under it	14a. Against spine of carabiner
15. Lock carabiner	

FIRE FIGHTER II

OPERATIONS	KEY POINTS
16. Attach long prusik loop	16a. To main line b. Near directional change pulley c. Between short prusik loop and directional change pulley
17. Form a bight	17a. In running end of main line
18. Attach pulley	18a. To bight in main line
19. Attach carabiner	19a. To pulley b. Biting down c. Flipping up
20. Attach carabiner	20a. To long prusik loop
21. Lock carabiner	
22. Perform safety checks	22a. All anchor components b. All main line components



APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: HOW TO CONSTRUCT A 3:1 PIGGY BACK RAISING SYSTEM

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A belay system, RPM, commercial rescue harnesses, rescue litter, pre-rig, webbing, rescue ropes, pulley, anchor slings, carabiners, edge protection, a simulated load, and appropriate personal protective equipment

Behavior: The student will construct and operate a 3:1 piggy back raising system

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- Belay system
- RPM
- 4 commercial rescue harnesses
- Rescue litter
- Pre-rig
- 3 20-foot lengths of 1-inch webbing
- 2 rescue ropes
- Pulley
- 2 anchor slings
- 5 carabiners
- Edge protection
- Simulated load
- Appropriate personal protective equipment

REFERENCES:

- Rescue Systems 1 Student Manual, SFT, 2000, Chapter 17



FIRE FIGHTER II

PREPARATION:

To complete most rescue operations, a few basic skills must be mastered. The accuracy with which these basic skills are learned will increase the speed and safety of the entire rescue operation.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
CONSTRUCT MAIN LINE	
1. Form a multi-loop anchor sling	1a. Around anchor point
2. Attach RPM	2a. To anchor sling
3. Lock carabiner	
4. Tie figure eight on a bight	4a. In working end of rescue rope
	b. Forming a 4-6 inch bight
5. Place working end of rescue rope	5a. Near point of departure
6. Attach short prusik loop	6a. To running end of main line
	b. Three-wrap prusik hitch
7. Attach short prusik loop	7a. To carabiner at end of mariner's hitch
8. Lock carabiner	
9. Attach change of direction pulley	9a. To main line
	b. Behind the short prusik loop
10. Attach change of direction pulley	10a. To carabiner on RPM
	b. Second hole from right
11. Lock carabiner	
CONSTRUCT 3:1 PIGGYBACK SYSTEM	
12. Tie figure eight on a bight	12a. In working end of other rope
13. Form coil in the running end of rope	13a. Around figure eight on a bight
	b. 2-3 inches in diameter
14. Attach mechanical advantage pulley	14a. To standing part of rope
	b. Near figure eight on a bight

FIRE FIGHTER II

OPERATIONS	KEY POINTS
15. Attach mechanical advantage pulley	15a. To figure eight on a bight b. With a carabiner
16. Attach change of direction pulley	16a. To standing part of rope b. Opposite end of coil from mechanical advantage pulley
17. Attach carabiner	17a. To change of direction pulley b. Biting down c. Flipping up
18. Attach long prusik loop	18a. To main line b. Behind change of direction pulley c. Three-wrap prusik hitch
19. Attach mechanical advantage pulley	19a. To long prusik loop b. With a carabiner c. Running end outside of 90° angle formed in main line by first change of direction pulley
20. Lock carabiner	
21. Assemble belay system	
22. Position edge protection	22a. Under main line b. Belay line
23. Perform safety checks	23a. All anchor components b. All belay systems components c. All main line components



APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC:	HOW TO CHANGE A LOWERING SYSTEM TO A RAISING SYSTEM (Z-RIG)
TIME FRAME:	0:15
LEVEL OF INSTRUCTION:	Level II
AUTHORITY:	SBFS
BEHAVIORAL OBJECTIVE:	
Condition:	A belay system, RPM, rescue rope, anchor slings, pulley, carabiner, simulated load, suitable facility with a high anchor point, and appropriate personal protective equipment
Behavior:	The student will change a lowering system to a raising system (z-rig)
Standard:	Completing all operations within _____ according to the job breakdown
MATERIALS NEEDED:	<ul style="list-style-type: none">• Job breakdown• Belay system• RPM• Rescue rope• Anchor slings• Pulley• Carabiner• Simulated load• Suitable facility with a high anchor point• Appropriate personal protective equipment
REFERENCES:	<ul style="list-style-type: none">• <u>Rescue Systems 1 Student Manual</u>, SFT, 2000 Edition, Chapter 17
PREPARATION:	To complete most rescue operations, a few basic skills must be mastered. Changing a lowering system to a raising system prevents the rescuer from having to build an additional system and frees rescue equipment for other tasks.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Lock off lowering line	1a. On brake bar rack or other friction device
2. Attach short prusik loop	b. Simulated load on line
3. Attach change of direction pulley	2a. To standing part of lowering line
4. Attach short prusik loop	b. Near brake bar rack
5. Attach change of direction pulley	c. Three-wrap prusik hitch
6. Lock carabiner	3a. On lowering line
7. Set short prusik loop	b. Between brake bar rack and prusik hitch
8. Unlock and release main line	4a. To carabiner at end of mariner's hitch
9. Attach long prusik loop	5a. To carabiner at end of mariner's hitch
10. Form bight	b. Sliding pulley with prusik under it against spine of carabiner
11. Attach mechanical advantage pulley	7a. On main line by pushing it towards load
12. Attach carabiner	8a. At brake bar rack
	b. Transferring load to short (ratchet) prusik loop
	9a. To main line near edge
	10a. In running end of main line
	11a. To bight in main line
	12a. To pulley
	b. Biting down
	c. Flipping up



OPERATIONS	KEY POINTS
13. Attach carabiner	13a. To long prusik loop
14. Lock the carabiner	
15. Perform safety checks	15a. All anchor components
	b. All belay systems components
	c. All main line components



APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: PERSONAL PROTECTIVE EQUIPMENT FOR RESCUE SCENARIOS

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 3-1.1.2 and SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of selecting personal protective equipment for rescue scenarios by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Firefighter's Handbook, Delmar, 2000 Edition, Chapter 16

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Firefighter's Handbook, Delmar, 2000 Edition

PREPARATION: The many different emergency situations faced by fire fighters require that appropriate personal protective equipment be selected for the situation at hand. Knowledge of the appropriate PPE will reduce possible injuries to fire fighters and ensure a successful incident termination.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. APPROPRIATE PPE SELECTION</p> <p>A. Collapse, low angle, trench, and cave/mine rescues</p> <ol style="list-style-type: none"> 1. Helmet <ol style="list-style-type: none"> a) Wildland or approved climbing helmet b) Mounted light 2. Gloves <ol style="list-style-type: none"> a) Preferably rappel type 3. Clothing <ol style="list-style-type: none"> a) Wildland coat and trousers or jumpsuit b) Preferably Nomex (or equivalent) 4. Boots <ol style="list-style-type: none"> a) Leather b) Steel toes c) Steel shank 5. Thermal protection <ol style="list-style-type: none"> a) Cotton sweatshirt b) Fleece liner c) Long underwear 6. Respiratory protection <ol style="list-style-type: none"> a) SCBA b) Dust mask c) Air purifying respirator 7. Eye protection <ol style="list-style-type: none"> a) Goggles b) Safety glasses 8. Knee and elbow pads 	<p>What is appropriate PPE for these situations?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>B. Structure fire rescues</p> <ol style="list-style-type: none"> 1. Helmet <ol style="list-style-type: none"> a) Structure helmet with shield and/or goggles b) Nomex hood (or equivalent) 2. Gloves 3. Clothing <ol style="list-style-type: none"> a) Turnout coat and trousers with liners and/or suspenders 4. Boots <ol style="list-style-type: none"> a) Approved entry boots 5. Respiratory protection <ol style="list-style-type: none"> a) SCBA <p>C. Water and ice rescues</p> <ol style="list-style-type: none"> 1. Water rescue helmet <ol style="list-style-type: none"> a) Head lamp 2. Swim fins 3. Thermal protection <ol style="list-style-type: none"> a) Dry suit b) Wet suit 4. Eye/respiratory protection <ol style="list-style-type: none"> a) Mask b) Snorkel 5. Whistle 6. Knife 7. Personal floatation device (PFD) 	<p>What specialized PPE is needed for a water and ice rescue?</p>



FIRE FIGHTER II

SUMMARY:

Different rescue scenarios require a variety of PPE. Nearly all rescues require respiratory protection, thermal protection, and protection from blunt trauma. The type of rescue situation you are dealing with will dictate the level of protection, and the design and characteristics of the PPE.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Firefighter's Handbook, Delmar, 2000 Edition, Chapter 16 in order to prepare yourself for the upcoming test. Study for our next session.

FIRE FIGHTER II

TOPIC: STRATEGY AND TACTICS AT EMERGENCIES

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-3.2

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the priorities at an emergency scene by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Fire Fighting Tactics, Lloyd Layman, 1953 Edition, Chapter 1

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Fire Command, Alan V. Brunacini, 1985 Edition
- Fire Fighting Tactics, Lloyd Layman, 1953 Edition

PREPARATION:

An Incident Commander must decide what tactical objectives must be achieved and in what order of priority they should be completed. All fire fighters should be able to identify these tactical priorities developed by the Incident Commander to facilitate communications. Tactical priorities have been recognized as essential to controlling emergency scenes.

PRESENTATION	APPLICATION
<p>I. FIREGROUND OPERATIONS SAFETY</p> <ul style="list-style-type: none"> A. Safety of participant is the first priority B. Command <ul style="list-style-type: none"> 1. Safety is a primary responsibility of the Incident Commander C. Fire fighter attitude <ul style="list-style-type: none"> 1. Everyone involved in the operation is concerned with safety and accepts personal responsibility D. Standard operating procedures <ul style="list-style-type: none"> 1. Safety is built into every operation as a standard approach E. Division/Group Supervisors <ul style="list-style-type: none"> 1. All fireground operations are directed and coordinated by Division/Group Supervisors with standard responsibility for managing safety F. Safety training <ul style="list-style-type: none"> 1. All personnel are trained in safety practices, procedures, and approaches G. Health and fitness <ul style="list-style-type: none"> 1. Fire fighters are in the physical and emotional condition to perform safely H. Self-contained breathing apparatus (SCBA) <ul style="list-style-type: none"> 1. No one operates in a contaminated atmosphere or one that may become contaminated without full respiratory protection 	<p>Can you identify the safety factors essential to fireground operations?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. PPE</p> <ol style="list-style-type: none"> 1. Everyone wears appropriate personal protective equipment whenever subject to physical hazards <p>J. Maintenance</p> <ol style="list-style-type: none"> 1. Equipment and apparatus are well maintained, properly designed, and up-to-date <p>K. Risk management</p> <ol style="list-style-type: none"> 1. A limited amount of risk is accepted but no effort is spared to avoid or control unmanaged risks <p>II. SIZE-UP</p> <p>A. The standard decision making process must be used to analyze the rescue situation</p> <ol style="list-style-type: none"> 1. What are the facts? 2. What are the probabilities? 3. What is your own situation? 4. What is the best decision? 5. What is the most effective plan of action? <p>B. Choose a strategy</p> <ol style="list-style-type: none"> 1. Offensive 2. Defensive 3. It is always bad to try both at the same time <ol style="list-style-type: none"> a) IC must pick one or the other 	<p>What five questions are asked in the standard decision making process?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>III. RESCUE</p> <ul style="list-style-type: none"> A. Those operations required to remove people (or valued livestock) from an involved building or other hazardous situation and move them to a place of safety B. Rescue is always given first tactical priority at an emergency scene <p>IV. EXPOSURE PROTECTION</p> <ul style="list-style-type: none"> A. Those operations required to prevent fire from extending to uninvolved buildings or separate units within a building B. Other than rescue, exposure protection is the immediate mission of first arriving companies C. Five factors contribute to fire spread <ul style="list-style-type: none"> 1. Heat transfer 2. Vertical spread 3. Distance of exposed buildings 4. Building construction 5. Weather conditions <p>V. CONFINEMENT OF FIRE</p> <ul style="list-style-type: none"> A. Consists of those operations which isolate fire from adjoining areas and structures B. Can be an involved operation when smoke condition is heavy, structure is large, etc. 	<p>What does the term "rescue" mean in the fire service?</p> <p>What is meant by exposure protection?</p> <p>What is confinement?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>VI. EXTINGUISHMENT</p> <ul style="list-style-type: none"> A. Putting out flames and completely controlling the fire so that no abnormal heat or smoke remain B. Direct attack and extinguishments of the fire may accomplish both confinement and exposure protection <p>VII. VENTILATION</p> <ul style="list-style-type: none"> A. The controlled movement of air from one area to another B. In fire fighting, ventilation consists of those operations required to displace a heated and contaminated atmosphere within an involved building with air from an uninvolved area or outside <ul style="list-style-type: none"> 1. Ventilation is done to <ul style="list-style-type: none"> a) Enhance rescue by improving visibility b) Confine the fire by decreasing heat spread c) Extinguish the fire d) Assist salvage operations e) Speed up overhaul operations f) Increase fire fighter safety by reducing flashover potential 2. A number of ventilation operations can be used at any particular fire 	<p>What does extinguishments mean?</p> <p>What does "ventilation" mean in general terms?</p> <p>What does the term "ventilation" mean during fire fighting operations?</p>

PRESENTATION	APPLICATION
<p>C. Ventilation can come at any time after size-up, and must be if backdraft conditions exist</p>	<p>What do salvage operations consist of?</p>
<p>VIII. SALVAGE OPERATIONS</p> <p>A. Those operations required to protect buildings and contents from preventable damage from</p> <ol style="list-style-type: none"> 1. Smoke damage 2. Fire damage 3. Water damage <p>B. New terminology for salvage is property conservation</p> <p>C. Salvage is considered after rescue and size-up, and can be come a higher consideration depending on the fire</p> <p>D. Can involve major allocation of personnel resources</p>	<p>What do overhaul operations provide?</p>
<p>IX. OVERHAUL OPERATIONS</p> <p>A. Those operations required to complete extinguishments after knockdown</p> <ol style="list-style-type: none"> 1. Prevents rekindles 2. Uncovers hidden fires 3. Helps place building in a safe condition by ensuring utilities are shutdown <p>B. Overhaul requires attention to</p> <ol style="list-style-type: none"> 1. Salvage 2. Safety, alertness/fatigue of personnel 3. Building or structural condition 	<p>What other areas does overhaul require knowledge of?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>4. Avenues of fire spread</p> <p>X. THE TACTICAL PLAN</p> <p>A. Based upon</p> <ol style="list-style-type: none"><li>1. Strategy<li>2. Tactical priorities <p>B. Basic, simple</p> <ol style="list-style-type: none"><li>1. Examples<ol style="list-style-type: none"><li>a) Aggressive interior attack with handlines in support of search and rescue<li>b) Ventilate and check for attic extension	<p>What is a tactical plan?</p>



SUMMARY:

The tactical priorities at an emergency scene: size-up, rescue, safety factors, exposures, confinement, extinguishments, ventilation, salvage, and overhaul.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Fighting Tactics, Lloyd Layman, 1953 Edition, Chapter 1 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: FACTORS THAT DETERMINE THE SIZE AND TYPE OF FIRE STREAM NEEDED

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-3.2

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the factors which determine the size and type of fire stream to be used by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Fire Stream Practices, IFSTA, Seventh Edition, Chapter 2

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Fire Stream Practices, IFSTA, Seventh Edition

PREPARATION: Various kinds of fire streams are required for the control of structural fires, flammable liquid fires, and fires in which energized electrical equipment is involved. The coordination and use of available water, fire equipment, fire apparatus, and proper training are essential for the production of effective fire streams.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. FIRE STREAM SIZE</p> <p>A. To achieve tactical success through the correct selection and use of fire stream type, size, placement, timing, and supply</p> <p>B. Critical fireground operation decision concerns how much water should be applied to the fire</p> <ol style="list-style-type: none"> 1. Volume below this rate will not extinguish the fire 2. Volume above it tends to do excessive damage <p>C. Water must be applied at a rate sufficient to overpower the fire</p> <p>D. The rate of flow is a result of the decisions made when selecting the size and number of hoselines to be used and the nozzle type</p> <p>E. Choosing hoselines for fire fighting is similar to choosing artillery for battle</p> <ol style="list-style-type: none"> 1. The weapon must match the target <p>F. Select and use, from the very beginning, the line size that eventually may be required</p> <ol style="list-style-type: none"> 1. Avoid playing catch-up 	<p>What are the objectives in determining effective fire streams?</p> <p>How is the rate of flow determined?</p> <p>Why is it important to choose the correct line and nozzle initially?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>G. Each has its unique set of strengths and weaknesses with a consistent trade off between speed, mobility, volume, and effort</p> <p>II. COMMON HANDLINES</p> <p>A. Small (booster line)</p> <ol style="list-style-type: none"> 1. Fast, mobile, and very low volume 2. Incipient fires only <ol style="list-style-type: none"> a) Shall not be used on initial attack on structural fires <p>B. Medium (1½", 1¾", 2" lines)</p> <ol style="list-style-type: none"> 1. Fast, mobile, and medium volume 2. Aggressive, offensive fire fighting for small to medium fires <p>C. Large (2½" line)</p> <ol style="list-style-type: none"> 1. Slower, less mobile 2. Large volume with heavy knockdown, reach, and penetration <p>III. STRUCTURAL FIRE STREAM PLACEMENT</p> <p>A. Hoselines should be advanced inside fire buildings to</p> <ol style="list-style-type: none"> 1. Control interior access to halls, stairways, vertical and horizontal channels 	<p>What are the characteristics of the different size handlines?</p> <p>What are some common handlines available for use by fire fighters?</p>

PRESENTATION	APPLICATION
<p>B. Between the fire and any persons endangered by it</p> <ol style="list-style-type: none"> 1. Protect the victims first and then protect their means of escape <p>C. Between the fire and the most severe exposure</p> <ol style="list-style-type: none"> 1. If no life hazard <p>D. Second line to</p> <ol style="list-style-type: none"> 1. Backup the first 2. Protect the secondary means of egress <p>E. Additional lines</p> <ol style="list-style-type: none"> 1. Support and reinforce attack positions 2. Assist rescue 3. Support confinement 4. Check for extension 5. Protect exposures 	<p>Where should the first hoselines be placed?</p> <p>Where should the second hoseline be placed?</p> <p>What are the reasons for putting additional hoselines in operation?</p>
<p>IV. MASTER STREAMS</p> <p>A. Used on large fires from the outside in defensive mode</p> <ol style="list-style-type: none"> 1. Cut off extension 2. Confine the flames 3. Protect exposures 	<p>What is an example of when to use master streams?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>4. Darken down the fire</p> <p>B. When master streams are used no interior personnel or lines should be in use</p> <p>V. WILDLAND HOSE STREAM PLACEMENT</p> <p>A. Structural protection keep the structure between you and the fire</p> <p>B. On the fire line keep hoseline in the black, wetting the area as hoseline is advanced</p> <p>C. Use minimum of 1½" hoseline on active fire front</p> <p>1. Smaller hoselines can be used on laterals for mop up</p> <p>D. Use the structure to block the heat from the approaching fire</p> <p>E. Remember LCES</p> <p>1. Lookouts</p> <p>2. Communication</p> <p>3. Escape route</p> <p>4. Safety zones</p>	<p>Where should the hoseline be placed on wildland fires?</p>



FIRE FIGHTER II

SUMMARY:

Skillful fire control requires fast, well-placed streams with an adequate water supply which is coordinated, timed, and managed through the collective efforts of everyone on the fireground.

There are important points in this lesson that can prevent fire fighter injury and death on the fireground such as, not using master streams and handlines inside a structure simultaneously. Understanding and application of fire streams will give you effective and safe decisions on the fireground.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Stream Practices, IFSTA, Seventh Edition, Chapter 2 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: SAFETY PRECAUTIONS WHEN ADVANCING HOSELINES INTO FIRE AREAS

TIME FRAME: 0:15

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 3-3.9 and SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the safety precautions to be used when advancing hoselines into fire areas by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Hose Practices, IFSTA, Seventh Edition, Chapter 4

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Essentials of Fire Fighting, IFSTA, Fourth Edition
- Hose Practices, IFSTA, Seventh Edition

PREPARATION: The citizens in your community have the right to expect a certain level of proficiency when you arrive at the scene of a fire. In order for you to perform effectively, your personal safety becomes a priority. With this in mind, we will look at some precautions to be taken when advancing hoselines into fire areas.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ol style="list-style-type: none"> 2. Check-in with the Accountability Officer and/or IC 3. Have a forcible entry tool and a hoseline <ol style="list-style-type: none"> a) No less than 1½" hoseline, 100 gpm 4. Ensure your Rapid Intervention Crew is set-up 5. Ensure utilities are being addressed <p>C. Upon entry at the door</p> <ol style="list-style-type: none"> 1. Work as a team <ol style="list-style-type: none"> a) Two fire fighters minimum <ol style="list-style-type: none"> 1) 2-in/2-out 2. Communicate with your partner 3. Bleed air from the nozzle and set your pattern <ol style="list-style-type: none"> a) Pattern should be straight stream up to a 30° fog stream <ol style="list-style-type: none"> 1) Nothing wider is recommended 4. Check the door with the back of your ungloved hand, or unprotected wrist, starting at the bottom of the door 	<p>Who does the fire fighting crew check-in with before entry?</p> <p>What is the smallest hoseline you would take into a structure fire?</p> <p>What types of things will enhance your personal safety inside the building?</p> <p>What setting should the nozzle be set at?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ol style="list-style-type: none"> 5. The door may simply be on fire 6. If the door is hot, look to see that backdraft conditions do or do not exist <ol style="list-style-type: none"> a) Check for smoke sucking in and out of the bottom of the door b) Look to see if the fire has been ventilated horizontally or vertically <ol style="list-style-type: none"> 1) This will rule out a backdraft condition 2) If the building is not vented, look at the color of the smoke coming out of the building 7. If you believe backdraft conditions exist, notify your Company Officer that vertical ventilation is needed before entry is made 8. If backdraft conditions do not exist, have the nozzle person protect the forcible entry partner from the side of the door as it is opened or forced 9. Hook up to your SCBA and begin breathing air 10. Activate your personal alarm device <p>D. Upon entering the structure</p> <ol style="list-style-type: none"> 1. Once entry is made stay low and feel for heat through your hood 	<p>If a door is hot to the touch at the bottom of the door, what can this indicate?</p> <p>Why is it important that you at the door look for backdraft conditions?</p>



FIRE FIGHTER II

SUMMARY:

Personal safety must be a priority if we are to do jobs effectively. This lesson covers many of the steps to be considered when making entry and fighting a fire. All fire scenes will have varied circumstances, but by knowing the basic steps presented in this lesson you should be able to adapt to many fire situations commonly encountered.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Hose Practices, IFSTA, Seventh Edition, Chapter 4 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: CAUSES OF POOR FOAM GENERATION

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-3.1

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the causes of poor foam generation by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Fire Stream Practices, IFSTA, Seventh Edition, Chapter 3

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Essentials of Fire Fighting, IFSTA, Fourth Edition
- Fire Stream Practices, IFSTA, Seventh Edition
- Firefighter's Handbook, Delmar, 2000 Edition

PREPARATION:

Fire fighters need to understand how to apply foam. More important than just the application of foam, is the ability to troubleshoot problems as they occur and quickly restore foam production to a fire scene. Many tank farm fires can be kept small with quick effective use of foam. If the fire gets an upper hand, you may be on scene for days or weeks.

PRESENTATION	APPLICATION
<p>I. FOAM GENERATION DEVICES</p> <p>A. Attached to the pump</p> <ol style="list-style-type: none"> 1. Balanced pressure proportioner 2. Around the pump proportioner <p>B. Foam aspirating devices</p> <ol style="list-style-type: none"> 1. In-line eductor 2. Self-educing nozzle 3. High-expansion foam generators <p>II. TROUBLESHOOTING POOR FOAM PRODUCTION</p> <p>A. General</p> <ol style="list-style-type: none"> 1. Failure to match eductor and nozzle flow <ol style="list-style-type: none"> a) Results in no pickup of foam concentrate 2. Check for air leaks and that all fittings are tight <ol style="list-style-type: none"> a) Can cause loss of suction 3. Improper cleaning of proportioning equipment <ol style="list-style-type: none"> a) Results in clogged foam passages 4. Partially closed nozzle control <ol style="list-style-type: none"> a) Results in a higher nozzle pressure 5. Too long hose lay on discharge side of eductor 	<p>What type of apparatus mounted systems have you seen?</p> <p>What types of external foam producing devices have you seen?</p> <p>What is the most common pre-incident problem with foam devices?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 6. Kinked hose 7. Nozzle too far above eductor <ul style="list-style-type: none"> a) Results in excessive elevation pressure B. Incompatible foam mixture <ul style="list-style-type: none"> 1. Never mix Class A and B foams or different manufactures of the same class of foam 2. Use the foam recommended by the manufacturer C. Check proportioner for adequate discharge of foam and accuracy of percentage settings <p>III. IN-LINE PROPORTIONER PROBLEMS</p> <ul style="list-style-type: none"> A. Ensure proportioner gpm matches the nozzle gpm for adequate pressure for aspiration B. Pump 200 psi to the eductor compensating for any friction loss or elevation between the pump and the eductor C. Make sure the hose between the eductor and nozzle does not exceed 70% of the inlet pressure or the eductor will not aspirate the proper percentage of foam <ul style="list-style-type: none"> 1. Most departments limit to 100-150 feet of 1½" hose between the eductor and nozzle 2. A 95 gpm eductor with 95 gpm nozzle will use 100 psi of nozzle pressure (50% of inlet pressure), and the friction loss for 100 feet of 1½" hose needs to be calculated into the formula <ul style="list-style-type: none"> a) IFSTA calculates 22 psi of friction loss b) 122 psi is 61% with room to elevate the nozzle 	<p>How much hose does your department allow between educator and nozzle?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>D. Make sure no kinks in the hose exist and nozzles are used in the fully open position</p> <p>E. Make sure the correct foam and percentage are used for desired application</p> <p>IV. PROPORTION ACCURACY TESTING</p> <p>A. Just getting foam is does not necessarily mean the device is functioning appropriately</p> <p>B. A periodic test should be conducted on devices</p> <p>1. There is a viscosity difference between the foam and water</p> <p>a) 3% picks up 103% of AFFF, but picks up 110% of protein and fluroprotein foams</p> <p>b) Water will be picked up faster</p> <p>1) 1.9 gallons a minute in a 60 gpm nozzle at 3%</p> <p>2) This same rate will pick up 1.8 gallons a minute of AFFF</p> <p>c) This can be timed in increments</p> <p>1) At 60 gpm you should draw up 1 gallon every 31 seconds</p>	<p>Why should we check the accuracy if foam is produced from a nozzle?</p> <p>What will pick up faster in an educator, water, or AFFF?</p>



FIRE FIGHTER II

SUMMARY:

It is important that the fire fighter understands and can troubleshoot problems related to foam use. At large fires this can mean the difference between keeping the incident small or taking days to extinguish a tank farm fire.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Stream Practices, IFSTA, Seventh Edition, Chapter 3 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: TYPES OF APPARATUS AND EQUIPMENT NEEDED FOR PROVIDING WATER AT RURAL LOCATIONS

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level I

AUTHORITY: 1997 NFPA 1001 3-3.14 and SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of types of apparatus and equipment needed for providing water at rural locations by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Pumping Apparatus Driver/Operator Handbook, IFSTA, First Edition, Chapters 2 and 14

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Pumping Apparatus Driver/Operator Handbook, IFSTA, First Edition
- NFPA Standard #1901, NFPA, 1999 Edition

PREPARATION: While a pump operator normally obtains water from a hydrant system, many situations can require the use of alternate sources. Earthquakes, floods, power failure, freezing weather, explosions, vandalism, and sabotage can render normal water supply systems inoperative. In rural areas, it is often necessary to depend upon portable or static water sources for fire fighting. In those areas, portable and static water sources can be considered as the primary sources of water supply. The pump operator must be familiar with these sources of water to effectively provide the needed water to extinguish the fire.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> b) Adequate venting c) Stay within manufacturer's gross vehicle weight rating d) Good road ability <p>II. PORTABLE PUMPS</p> <ul style="list-style-type: none"> A. Often standard and necessary equipment for rural areas B. Can draft from inaccessible locations C. Floatable pumps D. Supply 250-300 gpm <ul style="list-style-type: none"> 1. Not effective on structure fires 2. Used to fill tenders or portable tanks <p>III. PORTABLE TANKS</p> <ul style="list-style-type: none"> A. Commercially available to 3,000 gallons B. Locally built up to 6,000 gallons C. Most common is folding or collapsible <ul style="list-style-type: none"> 1. Can be carried on fire apparatus 2. Set up in seconds 3. Need flat area D. Used as reservoir for attack pumper <ul style="list-style-type: none"> 1. Located so many tenders can dump at once 2. Close to traffic-way 3. Water must be drafted out of tanks 4. May need special equipment <ul style="list-style-type: none"> a) Suction devices b) Siphons, etc. 	<p>When would you need a portable tank?</p>



FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>E. Other functions</p> <ol style="list-style-type: none">1. Safety valve in relay operation2. Different or damaged hose threads3. Damaged or low-flowing hydrant	<p>What are some other functions?</p>



FIRE FIGHTER II

SUMMARY:

There may be times when a fire pumper may have to rely on sources other than the usual water systems found in most communities. In rural areas, these sources may be water tenders or drafting from static sources, such as portable tanks and reservoirs.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Pumping Apparatus Driver/Operator Handbook, IFSTA, First Edition, Chapters 2 and 14 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: PROCEDURES FOR WATER SHUTTLE OPERATIONS

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 3-3.14 and SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the procedures for water shuttle operations by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Pumping Apparatus Driver/Operator Handbook, IFSTA, First Edition, Chapters 13 and 14

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Pumping Apparatus Driver/Operator Handbook, IFSTA, First Edition

PREPARATION:

Use of a water shuttle for emergency operations is not limited to the use in wildland or rural operations. The shuttle may be used in urban areas because of poor accessibility, excessively long hose lays, and/or interruption of normal water supply. In any event, you should have a thorough knowledge of the process and procedure involved in the water shuttle. The water shuttle is designed to supplement a less than desirable water supply.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> c) Less maneuverable 5. Three ICS classifications <ul style="list-style-type: none"> a) Type I <ul style="list-style-type: none"> 1) 2,000 gallons/300 gpm b) Type II <ul style="list-style-type: none"> 1) 1,000 gallons/120 gpm c) Type III <ul style="list-style-type: none"> 1) 1,000 gallons/120 gpm C. Private and commercial resources <ul style="list-style-type: none"> 1. Railroad tank cars 2. Public works vehicles 3. Cement trucks 4. Milk trucks 5. Other tank vehicles D. Portable pumps <ul style="list-style-type: none"> 1. Often standard and necessary equipment for rural areas 2. Can draft from inaccessible locations 3. Floatable pumps 4. Supply 250-300 gpm <ul style="list-style-type: none"> a) Not effective on structure fires b) Used to fill tenders or portable tanks E. Portable tanks <ul style="list-style-type: none"> 1. Commercially available to 3,000 gallons 2. Locally built up to 6,000 gallons 3. Most common is folding or collapsible <ul style="list-style-type: none"> a) Can be carried on fire apparatus b) Set-up in seconds c) Need flat area 	

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>4. Used as reservoir for attack pumper</p> <ol style="list-style-type: none"> a) Located so many tenders can dump at once b) Close to traffic-way c) Water must be drafted out of tanks d) May need special equipment <ol style="list-style-type: none"> 1) Suction devices 2) Siphons, etc. <p>III. COMPONENTS</p> <ol style="list-style-type: none"> A. Dump site B. Fill site C. Shuttle route <p>IV. SET-UP</p> <ol style="list-style-type: none"> A. Need to determine the following <ol style="list-style-type: none"> 1. Location of dump site 2. Location of fill site 3. Route of travel between dump and fill sites B. Success or failure of the operation often hinges on the location of dump and fill sites as well as route of travel C. Pre-incident planning should be used to target hazards and geographical areas within each jurisdiction D. Selecting dump site <ol style="list-style-type: none"> 1. Location should be in close proximity to the incident scene <ol style="list-style-type: none"> a) Front and center of incident may no be best location b) Example <ol style="list-style-type: none"> 1) Incident located down a narrow lane, drive way, or dead-end street 	

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> • Should locate dump site at the intersection where the lane, driveway, or dead-end street meets a thorough-fare <p>E. Selecting fill site</p> <ol style="list-style-type: none"> 1. Appropriate fill sites should be identified through pre-incident planning 2. Location should be the closest suitable water supply source to the incident <ol style="list-style-type: none"> a) The closest suitable water supply source may not be the closest source to the incident <p>F. Selecting route of travel</p> <ol style="list-style-type: none"> 1. A circular route of travel is considered to be the optimum method <ol style="list-style-type: none"> a) The full tankers leave the fill site following one route to the dump site b) The empty tenders leave the dump site and proceed to the fill site using a different route 2. Roadways used during shuttle operations should be closed to all traffic other than emergency vehicles, if possible 3. Safety considerations <ol style="list-style-type: none"> a) Driving the shuttle route is one of the most hazardous tasks for tender drivers/operators b) Narrow roads c) Long driveways d) Blind curves and intersections e) Winding roads f) Steep roads g) Inclement weather conditions 	



FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>V. AUXILIARY CARRIERS</p> <ul style="list-style-type: none">A. TankersB. Food carriersC. Cement trucksD. Auxiliary equipment	

**SUMMARY:**

Determining the need for a water shuttle is based on the distance, length of lay, and amount of water needed for the incident. This also determines the best type of apparatus to handle the shuttle. In times of need, alternative vehicles can be used as water tenders. Examples include cement truck, milk tankers, etc.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Pumping Apparatus Driver/Operator Handbook, IFSTA, First Edition, Chapters 13 and 14 in order to prepare yourself for the upcoming test. Study for our next session.

FIRE FIGHTER II

TOPIC: METHODS USED TO DETERMINE WATER SYSTEM FLOW PRESSURE

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 3-3.14 and SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the methods used to determine water system flow pressure by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Pumping Apparatus Driver/Operator Handbook, IFSTA, First Edition, Chapters 13 and 14

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Pumping Apparatus Driver/Operator Handbook, IFSTA, First Edition

PREPARATION: Determining flow pressure is the first step in assessing the ability of a water system to provide the required fire flow. Without knowing the flow pressure, we cannot determine the actual gallons flowing.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. FLOW PRESSURE DEFINED</p> <ul style="list-style-type: none"> A. The forward velocity pressure at a discharge opening while water is flowing B. A stream of water emerging from a discharge opening is not encased within a tube, it exerts forward pressure not sideways pressure C. Can be measured by using a pitot tube and gauge <p>II. DETERMINING FLOW PRESSURE</p> <ul style="list-style-type: none"> A. Use pitot tube with gauge <ul style="list-style-type: none"> 1. Placed in front of orifice <ul style="list-style-type: none"> a) Nozzle b) Hydrant c) Hose d) Pipe 2. Hold steady <ul style="list-style-type: none"> a) More accurate reading 3. Electronic visual pressure and flow meters <ul style="list-style-type: none"> a) Can be at each discharge port b) Can be used in hoseline c) Can be used on a hydrant B. Read setting on gauge <p>III. USE</p> <ul style="list-style-type: none"> A. Used with formula for determining gpm 	<p>What is flow pressure?</p>



FIRE FIGHTER II

SUMMARY:

Determining flow pressure is a very simple yet critical first step toward determining fire flow. While water is flowing, steadily hold the pitot tube in front of the discharge opening. Reading the gauge, we are able to obtain information that is converted into a formula. That will give us our gallons per minute for that discharge. The proper use of this technique is critical for accurate computation of gallons per minute.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Pumping Apparatus Driver/Operator Handbook, IFSTA, First Edition, Chapters 13 and 14 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: HOW TO USE A PITOT TUBE

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 3-3.14 and SBFS

BEHAVIORAL OBJECTIVE:

Condition: A fire hydrant with 2½" outlet, hydrant wrench, pitot tube with gauge, record sheet, and appropriate personal protective equipment

Behavior: The student will obtain a flow pressure using a pitot tube

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- Fire hydrant with 2½" outlet
- Hydrant wrench
- Pitot tube with gauge
- Record sheet
- Appropriate personal protective equipment

REFERENCES:

- Water Supplies for Fire Protection, IFSTA, Fourth Edition, Chapter 4

PREPARATION:

It is important for every fire fighter to know the ultimate capacity of the water system. Fire fighting defenses cannot be planned without all the known facts. A hydrant flow test for an area is a means for establishing certain facts. Flow tests are the only positive means to determine the quantity of water available for fire fighting.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Open petcock	1a. On pitot tube
2. Close petcock	2a. On pitot tube
3. Remove hydrant cap	3a. From 2½" outlet b. Counterclockwise
4. Open hydrant	4a. With hydrant wrench b. Counterclockwise c. Slowly
5. Pick up pitot tube	5a. Gauge face up b. Sharp edge of blade toward you
6. Grasp pitot tube	6a. At air chamber b. With right hand
7. Grasp pitot tube	7a. Left hand fingers b. Split around the gauge outlet
8. Place left wrist	8a. On the edge of the hydrant outlet
9. Edge pitot tube	9a. Into water stream b. Counterclockwise c. With small opening or point centered in the stream
10. Hold pitot tube	10a. Away from the butt or nozzle b. Approximately one-half the diameter of the opening (2½" = 1¼") c. 90° angle to stream
11. Read and record velocity pressure	

FIRE FIGHTER II

OPERATIONS	KEY POINTS
<i>AFTER TEST IS COMPLETED</i>	
12. Open petcock	12a. Draining all water b. From the assembly c. Before storing
13. Close hydrant	13a. With hydrant wrench
14. Replace hydrant cap	b. Clockwise



APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC:	METHODS FOR DETERMINING FIRE HYDRANT DISCHARGE CAPACITY
TIME FRAME:	1:00
LEVEL OF INSTRUCTION:	Level II
AUTHORITY:	1997 NFPA 1001 3-3.14 and SBFS
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of the methods for determining fire hydrant discharge capacity by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Water Supplies for Fire Protection</u> , IFSTA, Fourth Edition, Chapter 4
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials
REFERENCES:	<ul style="list-style-type: none">• <u>Water Supplies for Fire Protection</u>, IFSTA, Fourth Edition
PREPARATION:	When connecting a fire engine to a hydrant at a fire scene, it is vital to know if that hydrant is going to be capable of supplying enough water for the fire flow. The amount of water available must be determined before the emergency. This lesson will familiarize the student with the methods used to determine the available fire flow and how the hydrants are marked to display the flow available.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. TYPES OF PRESSURE</p> <p>A. Static pressure</p> <ol style="list-style-type: none"> 1. Stored or potential energy that is available to force water through pipes and fittings, fire hose, and adapters <p>B. Residual pressure</p> <ol style="list-style-type: none"> 1. That part of total pressure that is not used to overcome friction or gravity while forcing water through fire hose, pipe, fittings, and adapters <p>C. Flow pressure</p> <ol style="list-style-type: none"> 1. The forward velocity pressure at a discharge opening while water is flowing <p>D. Normal operating pressure</p> <ol style="list-style-type: none"> 1. That pressure found a water distribution system during normal consumption demands <p>II. FLOW TEST PROCEDURES</p> <p>A. Items to be tested</p> <ol style="list-style-type: none"> 1. Static pressure in the main 2. Residual pressure in the main 3. Flow pressure from the hydrants being tested 4. Normal operation pressure in the main <p>III. COMPUTING HYDRANT FLOWS</p> <p>NOTE: Demonstrate how to use the three methods of computing hydrant flows.</p> <p>A. Three methods</p> <ol style="list-style-type: none"> 1. Simplified Hazen-Williams formula <ol style="list-style-type: none"> a) Available water = $\frac{Q}{D_2} \sqrt{\frac{D_1}{D_2}}$ b) Q = Total gpm during the flow c) D₂ = Normal operating pressure minus 20 psi 	

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>d) $D_1 = \text{Normal operation pressure minus residual during flow}$</p> <p>2. Logarithmic scale methods</p> <p>a) Valves are entered into the logarithmic scale</p> <p>b) Information is interpreted on logarithmic scale</p> <p>3. Hazen-Williams method</p> <p>a) $Q_r = Q_f \times \left(\frac{h_r}{h_f} \right)^{0.54}$</p> <p>b) $Q_r = \text{Flow available at desired residual pressure}$</p> <p>c) $Q_f = \text{Flow during test}$</p> <p>d) $h_r = \text{Pressure drop to desired residual pressure}$</p> <p>e) $h_f = \text{Pressure drop during test}$</p>	
<p>IV. COLOR CODING OF FIRE HYDRANTS</p> <p>A. Color codes allow the driver/operator to identify the available flow from a hydrant</p> <p>B. Four classes</p> <p>1. Class AA</p> <p>a) Light blue</p> <p>b) 1,500 gpm or greater</p> <p>2. Class A</p> <p>a) Green</p> <p>b) 1,000-1,499 gpm</p> <p>3. Class B</p> <p>a) Orange</p> <p>b) 500-999 gpm</p>	



FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none">4. Class D<ul style="list-style-type: none">a) Redb) Less than 500 gpmC. Color code should be painted on all tops and caps of hydrants	



FIRE FIGHTER II

SUMMARY:

To determine fire hydrant discharge capacity, we need to first get the static, residual flow, and normal operating pressure readings. Once we obtain those readings, we can use one of the three methods of computing hydrant flows to determine the discharge capacity. Having knowledge of how fire hydrant flows are obtained, it will give you a better understanding of the water available to the pump operation.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Water Supplies for Fire Protection, IFSTA, Fourth Edition, Chapter 4 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: CAUSES OF PRESSURE LOSS IN WATER SYSTEMS

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 3-3.14 and SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the causes of pressure loss in water systems by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Water Supplies for Fire Protection, IFSTA, Fourth Edition, Chapters 2 and 5

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Water Supplies for Fire Protection, IFSTA, Fourth Edition

PREPARATION:

Adequate water pressure to deliver an effective fire stream is imperative for successful fire fighting operations. Several causes exist that may reduce the available pressure. Familiarity with these causes may allow fire personnel to overcome pressure problems.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. DISTRIBUTION SYSTEMS</p> <p>A. System design factors</p> <ol style="list-style-type: none"> 1. Water piping too small <ol style="list-style-type: none"> a) In the past, 4" and 6" pipe was used b) Today 8" pipe is the minimum size installed c) Most cities use 8", 12", or 16" piping 2. Dead end hydrant <ol style="list-style-type: none"> a) Care should be exercised to use a pipe of adequate size to supply sufficient water for fire protection in addition to domestic needs <p>B. Natural occurrences</p> <ol style="list-style-type: none"> 1. Friction loss <ol style="list-style-type: none"> a) Water flowing through pipes is subject to friction loss b) Factors that effect the carrying capacity include <ol style="list-style-type: none"> 1) Size and length of pipe 2) Pressure at source 3) Resistance to flow <ul style="list-style-type: none"> • Caused by elevation, internal friction, bends/turns in pipe, joints and valves 	<p>What factors affect the carrying capacity of piping?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> b) Control valves may be gate valves or butterfly valves c) Control valves must be regularly maintained and kept fully opened d) High friction loss is caused by partially opened valves and may not be noticed during domestic flow of water <p>2. Hydrants</p> <ul style="list-style-type: none"> a) Proper maintenance of the hydrants valve makes opening and closing of the hydrant easier <p>F. Flow obstructions</p> <ul style="list-style-type: none"> 1. Incrustation is caused by nodules forming on the interior lining or by natural corrosion of unlined pipes <ul style="list-style-type: none"> a) Corrosion or rust modules – little can be done to prevent it except to line interior of pipe with cement b) Chemical build-up in the water c) Growth of biological organisms can be controlled by analysis of water and the use of chemical additives 2. Deposits <ul style="list-style-type: none"> a) Types of sedimentary deposits <ul style="list-style-type: none"> 1) Sand 2) Mud 3) Leaves b) Caused by the build up of sediments in the bottom interior of the pipe 	<p>Why must control valves be kept fully opened?</p> <p>What are the three types of incrustation?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>3. Incrustation and deposits which cause a gradual decrease in the main's carrying capacity will become evident during fire flow testing</p> <p>a) Decreased flow and higher pressure drop</p> <p>4. Foreign matter</p> <p>a) Waste</p> <p>1) Cans, bottles, paper, etc. can be placed in mains being installed or stuffed in open hydrant outlets</p> <p>b) Tools</p> <p>1) Boards, crowbars, stones, even 40 pound chunks of lead have been found in mains</p> <p>5. Malicious damage</p> <p>6. Valves</p> <p>II. OUTSIDE FACTORS</p> <p>A. Water system consumption</p> <p>1. Average daily consumption (ADC)</p> <p>a) Average used each day during a one year period</p> <p>2. Maximum daily consumption (MDC)</p> <p>a) Maximum total amount of water used during 24 hours in a three year period</p> <p>b) 1½ times the average daily consumption</p>	<p>What kinds of foreign matter may be found in water systems?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>3. Peak hourly consumption (PHC)</p> <ul style="list-style-type: none"> a) Maximum amount of water used in any given hour of a day b) Two to four times the normal hourly rate <p>4. Used to assure that the water supplies and pressures do not reach dangerously low levels during maximum and peak periods</p> <p>B. Flow pressure</p> <ul style="list-style-type: none"> 1. Use on the same main <ul style="list-style-type: none"> a) If another outlet or hydrant were opened a pressure drop at your hydrant to a lower level will be noticed b) If too many outlets are opened the water main may become useless <ul style="list-style-type: none"> 1) Not enough volume and pressure to operate 2) Automatic sprinkler systems, citizens with garden hoses will effect your flow pressure 	<p>Why are these consumption rates important to us as fire fighters?</p> <p>Why must we be concerned about flow pressure?</p> <p>What outside factors may affect flow pressure?</p>



FIRE FIGHTER II

SUMMARY:

There are many causes of pressure loss in water systems. Internal systems and outside influence are the two areas in the water system that could cause a pressure loss. Problems within distribution systems include system design factors, natural occurrences, such as friction loss, closed valves and flow obstructions. Outside factors that can affect pressure loss include water system consumption by the public. Inside and outside factors both influence pressure loss. While most of these items are beyond your control, being aware of the different causes may help identify a situation to the proper agencies.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Water Supplies for Fire Protection, IFSTA, Fourth Edition, Chapters 2 and 5 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: HOW TO MAINTAIN WET AND DRY BARREL HYDRANTS

TIME FRAME: 0:30

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 3-3.14 and SBFS

BEHAVIORAL OBJECTIVE:

Condition: A hydrant wrench, lubricant, wire brush, notebook, clean rag, and appropriate personal protective equipment

Behavior: The student will perform the maintenance cycle on wet and dry barrel hydrants

Standard: Completing all operations within _____ according to the job breakdown

MATERIALS NEEDED:

- Job breakdown
- Hydrant wrench
- Lubricant
- Wire brush
- Notebook
- Clean rag
- Appropriate personal protective equipment

REFERENCES:

- Water Supplies for Fire Protection, IFSTA, Fourth Edition, Chapter 3

PREPARATION:

It is necessary for fire hydrants to be inspected to determine the operating condition. Realize that lack of care and misuse of fire hydrants may result in a serious fire loss.

FIRE FIGHTER II

OPERATIONS	KEY POINTS
1. Inspect the hydrant	1a. Visually b. Obstructions c. Sufficient clearance d. Mechanical damage e. Condition of paint
2. Remove hydrant cap	2a. Counterclockwise b. For access to outlet
3. Inspect outlet	3a. Visually b. Foreign materials inside outlet
4. Open hydrant	4a. With hydrant wrench b. Counterclockwise c. Until fully opened
5. Check water stream	5a. For debris b. Until clear to flush the hydrant branch and hydrant
6. Close hydrant	6a. Clockwise b. Slowly c. To prevent water hammer d. Until completely closed
7. Tighten stuffing box nut	7a. If necessary b. With pipe wrench c. Clockwise d. Until water leakage stops

FIRE FIGHTER II

OPERATIONS	KEY POINTS
8. Clean threads	8a. On outlet and in caps b. With wire brush c. To remove rust and other deposits
9. Swab threads	9a. With oil/graphite mixture
10. Wipe threads clean	10a. With rag
11. Oil valve stem	11a. To prevent dry packing
12. Check gasket	12a. Inside cap b. For damage, cracks or missing
13. Check cap chain	13a. Free of paint b. Free running around groove in cap
14. Replace cap	14a. On outlet b. Clockwise c. Until hand tight



FIRE FIGHTER II

APPLICATION:

The student will practice performing the operations in the job breakdown while under supervision.

EVALUATION:

The student will complete a manipulative performance test at a time determined by the instructor.

ASSIGNMENT:

Practice this job in order to prepare yourself for the upcoming performance test. Study for our next session.

TOPIC: FEATURES OF A SUPERVISED FIRE ALARM SYSTEM

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-5.1

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the features of a supervised fire alarm system by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Private Fire Protection and Detection, IFSTA, Second Edition, Chapter 4

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Private Fire Protection and Detection, IFSTA, Second Edition

PREPARATION:

A supervised fire alarm system is a vital part of early fire alerting. To get the most out of the system, you must understand the features of the system, what they do, and how they can assist you. Early warning devices allow fire fighters to arrive on scene in a timely manner.

PRESENTATION	APPLICATION
<p>I. CONTROL PANEL</p> <p>A. Location</p> <ol style="list-style-type: none"> 1. Lobby 2. Equipment room 3. Exterior of building <p>B. Information</p> <ol style="list-style-type: none"> 1. Type of alarm <ol style="list-style-type: none"> a) Fire alarm b) Flow alarm c) Manual pull alarm d) Trouble alarm 2. Area of zone <p>C. Reset button</p> <p>D. Silence switch</p> <p>E. Power supply</p> <p>F. Special features (auxiliary)</p> <ol style="list-style-type: none"> 1. Auto dialers 2. Fire door releases 3. Shut down of HVAC 4. Closure of dampers 5. Operate smoke evacuation fans 6. Unlock doors 	<p>Where can the control panel be located?</p> <p>What type of information can the control panel display?</p> <p>What other features are available?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>7. Retransmit alarm to another building or property</p> <p>8. Ground fault detection</p> <p>9. Utilities (i.e., natural gas) shut down</p> <p>II. ALARM INITIATING DEVICES</p> <p>A. Fire alarm system design</p> <ol style="list-style-type: none"> 1. Initiating devices 2. Indicating devices connected by a control unit 3. Network wiring <p>B. In complex systems, initiating devices are wired into zones or identified as individual digital addressees</p> <ol style="list-style-type: none"> 1. Ease of installation 2. Clarity of identifying alarm signals 3. Clarity of identifying trouble signals <p>C. Locations of initiating zones or device addresses may be displayed on one or more annunciator panels or printers</p> <p>D. Types of alarm initiating devices</p> <ol style="list-style-type: none"> 1. Water flow (sprinkler and/or standpipe) 2. Detector <ol style="list-style-type: none"> a) Heat b) Smoke c) Combination heat and smoke d) Ultraviolet e) Infrared f) Catalytic 	<p>In complex systems, how are initiating devices wired?</p> <p>What are common initiating devices?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>2. Annunciator panels</p> <p>a) An electrical device used to indicate the source or location of a fire alarm initiating device</p> <p>b) Styles</p> <ol style="list-style-type: none"> 1) Lamp display 2) Target display <ul style="list-style-type: none"> • Old style • Has a flag that drops into a window indicating an activated zone 3) Graphic display <ul style="list-style-type: none"> • Scale map showing location of activated alarm zones 4) Digital <ul style="list-style-type: none"> • Indicates the zone and/or detector that activated by detector address and description on a digital display 5) Printer <ul style="list-style-type: none"> • Prints information given by the other styles <p>C. Location and design is vital</p> <ol style="list-style-type: none"> 1. Must be easily seen by responding fire units 	<p>What is an annunciator panel?</p> <p>What are the styles of annunciator panels?</p> <p>What are some factors that influence location and design of panels?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 2. May be located in a place of authority or security <ul style="list-style-type: none"> a) School office b) Office building command center 3. If numbers are used on a panel, an explanatory directory must be displayed 4. Panel may be equipped with an audible "call back" device 5. A call back switch may be provided <ul style="list-style-type: none"> a) When panel is in the "ready" mode, operation of switch rings the bell (for testing) b) When panel is in the "fire" (annunciated) mode, switch silences the bell D. Zones should cover an appropriate area <ul style="list-style-type: none"> 1. One zone per floor, or 2. One zone per 10,000 to 20,000 square feet, or 3. One zone per small building within a complex E. Panel must indicate the nature of the indicating device <ul style="list-style-type: none"> 1. Manual pull station 2. Detector 3. Water flow switch F. Access to annunciator panel face <ul style="list-style-type: none"> 1. If panel can be opened, fire department must have a key or other access means 2. Panel must be safeguarded from vandalism by intruders 	<p>What types of initiating devices are indicated on the panel?</p>

**FIRE FIGHTER II**

PRESENTATION	APPLICATION
<p>IV. POWER SUPPLY</p> <ul style="list-style-type: none">A. Primary power from grid<ul style="list-style-type: none">1. Public utility2. Municipal utilityB. Auxiliary power<ul style="list-style-type: none">1. Storage batteries<ul style="list-style-type: none">a) Dependent on systemb) Requires minimum of 24 hoursc) Can require as much as 60 hours2. Generator	



FIRE FIGHTER II

SUMMARY:

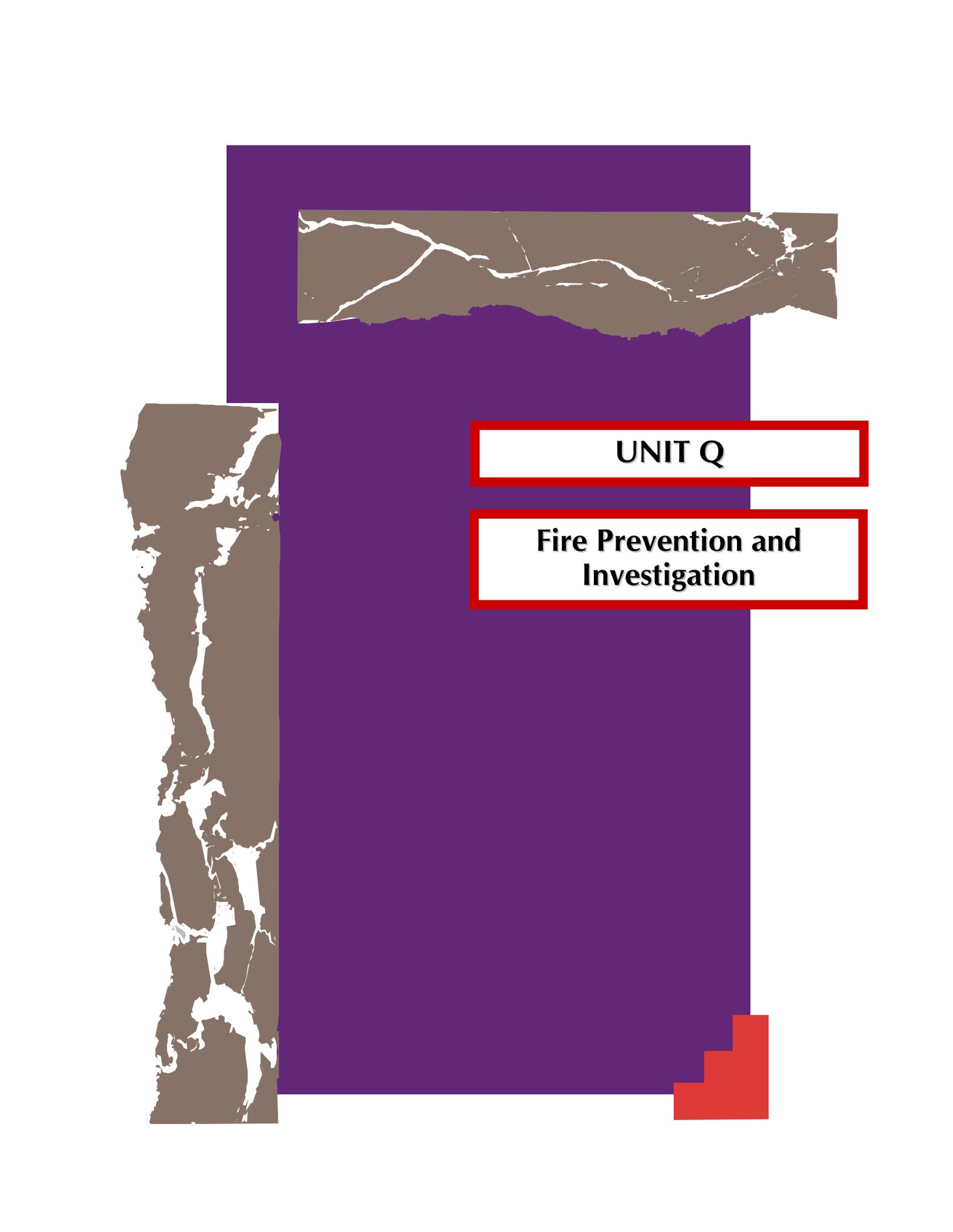
Alarm systems are the link between the fire suppression and detection systems, and fire fighters. All systems contain an alarm initiating device, a control panel, and an annunciator. An alarm-initiating device tells the system when there is a problem. The control panel makes the proper notifications, and then manages the building systems such as HVAC. The annunciator is a remote station that assists fire fighters in determining the location of a problem. All of this information is used collectively to improve property protection. Back-up devices include governors and batteries.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Private Fire Protection and Detection, IFSTA, Second Edition, Chapter 4 in order to prepare yourself for the upcoming test. Study for our next session.



UNIT Q

**Fire Prevention and
Investigation**

FIRE FIGHTER II

TOPIC:	FIRE INCIDENT REPORTS
TIME FRAME:	1:00
LEVEL OF INSTRUCTION:	Level I
AUTHORITY:	1997 NFPA 1001 4-2.1
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of the proper methods in writing accurate fire incident reports by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Firefighter's Handbook</u> , Delmar, 2000 Edition, Chapter 3
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials• Copies of locally completed forms
REFERENCES:	<ul style="list-style-type: none">• <u>California Fire Incident Report System Manual</u>, OSFM• <u>Firefighter's Handbook</u>, Delmar, 2000 Edition• <u>National Fire Incident Report Systems</u>• <u>Records and Reports for the Fire Service</u>, First Edition
PREPARATION:	The fire fighter is required by law to document all incidents that his or her jurisdiction responds to. An accurate field incidents report will assist local as well as state agencies in the prevention and planning for such incidents. Fire reports assist with budget, staffing, and analysis.

PRESENTATION	APPLICATION
<p>I. INTRODUCTION</p> <p>A. National and statewide data is gathered by the National Fire Incident Reporting System (NFIRS)</p> <p>B. NFIRS allows the ability to analyze the fire, medical and hazardous material problems as well as each local agency's problems in detail</p> <ol style="list-style-type: none"> 1. Analysis assists with planning for life safety and hazard mitigation <p>II. LOCAL INCIDENT REPORTING</p> <p>A. System allows the fire administrator to assess the fire agency's abilities to provide service to the community</p> <p>III. THREE REQUIREMENTS OF A WRITTEN REPORT</p> <p>A. Clear</p> <ol style="list-style-type: none"> 1. Make all statements direct 2. Use standard terms where applicable <p>B. Concise</p> <ol style="list-style-type: none"> 1. Say what needs to be said and no more, but with enough information to refresh memory in future if litigation arises <p>C. Easily understood</p> <ol style="list-style-type: none"> 1. If a report is clear and concise, it should be easily understood 	<p>What value does NFIRS have?</p> <p>What value does the local incident reporting system have?</p> <p>What three requirements must exist in a written report?</p>

**FIRE FIGHTER II**

PRESENTATION	APPLICATION
<p>IV. FIVE STEPS WHEN COMPLETING A REPORT</p> <ul style="list-style-type: none">A. The purpose and scope of the incident must be definedB. The methods of procedure must be outlinedC. The essential facts must be collectedD. The facts must be analyzed and categorizedE. The correct conclusion and recommendations must be made	<p>What five steps should be followed when completing a written report?</p>

**SUMMARY:**

Fire reporting systems are a compilation of fire, medical and hazardous materials responses by fire agencies. Local incident reporting is also required for administrative purposes. A written report must be clear, concise, and easily understood. All fire service personnel must understand the 5 steps of completing a report.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Firefighter's Handbook, Delmar, 2000 Edition, Chapter 3 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: COMPANY FIRE INSPECTION REPORTS

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-5.1

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the proper procedures in completing fire inspection reports by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in Fire Inspection and Code Enforcement, IFSTA, Sixth Edition, Chapter 2

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials
- Examples of local jurisdiction's company inspection reports

REFERENCES:

- Fire Inspection and Code Enforcement, IFSTA, Sixth Edition
- Firefighter's Handbook, Delmar, 2000 Edition

PREPARATION:

The company inspection report can contain valuable information for use by the fire service if filled out properly. In most cases, the only information-gathering vehicle needed to obtain information about occupancy is the company inspection report.

Company inspections are an integral portion of the fire service today. The ability of the individual fire fighter to correctly fill out the required paperwork is imperative in making the information usable.

PRESENTATION	APPLICATION
<p>NOTE: Have students follow a sample inspection form.</p> <p>I. BUSINESS INFORMATION MANAGEMENT</p> <p>A. Address</p> <ol style="list-style-type: none"> 1. Number 2. Street 3. City 4. Zip code <p>B. DBA</p> <ol style="list-style-type: none"> 1. Doing business as <p>C. Phone numbers</p> <ol style="list-style-type: none"> 1. Business 2. Main office, if applicable 3. Owner 4. Manager 5. Fire prevention bureau or fire station conducting inspection 6. In case of emergency <p>D. Occupancy classification</p> <ol style="list-style-type: none"> 1. UBC Table 5a 2. Type of business <p>E. Names of responsible parties</p> <ol style="list-style-type: none"> 1. Owner 2. Manager 3. Assistant manager <p>F. Date</p>	<p>What are the common items needed on all company fire inspection reports?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>G. Signature(s)</p> <ol style="list-style-type: none"> 1. Inspector(s) <ol style="list-style-type: none"> a) At the beginning of the inspection 2. Responsible party representing the place of business <ol style="list-style-type: none"> a) At the conclusion of the inspection <p>H. Date of follow up inspection</p> <p>II. COMPLIANCE/VIOLATION SECTION</p> <p>A. This section will differ in style with various agencies</p> <p>B. Sections</p> <ol style="list-style-type: none"> 1. Exiting requirements 2. Electrical requirements 3. General requirements <ol style="list-style-type: none"> a) Housekeeping b) Address c) Compressed gas d) Compressed storage e) Etc. 4. Sprinkler system 5. Standpipe system 6. Hood systems 7. Fire alarm systems 8. Portable fire extinguishers 	<p>What are some of the items that are subject to inspection?</p>

PRESENTATION	APPLICATION
<p>C. Guidelines for writing violation statements</p> <ol style="list-style-type: none"> 1. Start with verb <ol style="list-style-type: none"> a) Repair, remove, service, etc. 2. Ensure statements make sense and meet code requirements/content 3. Write legibly 4. Watch for spelling errors 5. Specific recommendations for correcting each violation 6. Ensure all violations are referenced to the fire code <ol style="list-style-type: none"> a) Legal description of the code b) Code section c) Edition of applicable code <ol style="list-style-type: none"> 1) Reference for future inspections 	<p>What are some guidelines in writing violations?</p>



FIRE FIGHTER II

SUMMARY:

Even though company fire inspection reports can vary from agency to agency, there should still be a place to include information about the occupancy such as name and address and about any compliance and/or violations. The company fire inspection report is a very valuable tool for the fire service if all of the necessary information is listed correctly, and the building occupant can quickly take care of noted hazards if violations are clearly and accurately spelled out. These two things can make the fire fighter's job on company fire inspections much easier.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Inspection and Code Enforcement, IFSTA, Sixth Edition, Chapter 2 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: PROCEDURES FOR PERFORMING ROUTINE COMPANY FIRE INSPECTIONS

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-5.1

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the procedures for performing routine company fire inspections by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Fire Inspection and Code Enforcement, IFSTA, Sixth Edition, Chapter 2

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials
- Local jurisdiction's company inspection report forms

REFERENCES:

- Essentials of Fire Fighting, IFSTA, Fourth Edition
- Fire Inspection and Code Enforcement, IFSTA, Sixth Edition
- Uniform Fire Code, IFCI, 1994 Edition

PREPARATION: One of the most important duties you will be involved with on a day-to-day basis is the company inspection. The company inspection program ensures the citizens, business owners, and proprietors within your jurisdiction that fire hazards are being noted and abated.

Your knowledge in company inspections will help to create the professionalism that is extremely important when dealing with the public on sometimes-controversial issues such as code enforcement.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. BUSINESS INSPECTION</p> <p>A. Success depends on the inspector</p> <p>B. Traits</p> <ol style="list-style-type: none"> 1. Personality 2. Knowledge 3. Appearance <p>II. THE INSPECTOR'S EQUIPMENT</p> <p>A. At the inspection</p> <ol style="list-style-type: none"> 1. Neat uniform <ol style="list-style-type: none"> a) Coveralls <ol style="list-style-type: none"> 1) Attics 2) Concealed spaces 2. Safety helmet 3. Inspection forms, clipboard, notepad 4. Flashlight, if needed 5. Measuring tape <ol style="list-style-type: none"> a) Soft b) Minimum 25 feet <p>B. At the fire station</p> <ol style="list-style-type: none"> 1. Inspection forms/reports 2. Reference manuals 3. Inspection files 	<p>What are some good traits an inspector should have?</p> <p>What equipment should be needed for an inspection?</p> <p>Where is an inspection started?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>4. Review previous inspections</p> <ol style="list-style-type: none"> a) Notes of variances b) Owner's attitude c) Previous violations d) Type of occupancy e) Special hazards f) Building codes <p>C. Schedule the inspection</p> <ol style="list-style-type: none"> 1. Appointment time 2. Contact's name 3. Address 4. Phone number <p>III. THE INSPECTION</p> <p>A. First look at the outside of the business</p> <ol style="list-style-type: none"> 1. Address <ol style="list-style-type: none"> a) Visible b) Correct 2. Access 3. Sprinkler/standpipe connections and valves 4. Protection of gas meters 5. Location of dumpsters 6. Hydrants 7. Housekeeping 8. Exiting <ol style="list-style-type: none"> a) Required number of exits b) Maximum travel distance 	<p>What is the first area checked for discrepancies and what is looked for?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>NOTE: Inspection personnel need to consult code used in their jurisdiction.</p> <p>B. Inside the occupancy</p> <ol style="list-style-type: none"> 1. Gain permission from the person in charge 2. Follow an established route <p>C. Common discrepancies</p> <ol style="list-style-type: none"> 1. Fire extinguisher 2. Electrical 3. Exiting 4. Hazardous processes 5. Housekeeping <ol style="list-style-type: none"> a) Fire extinguishers <ol style="list-style-type: none"> 1) Shall be serviced annually or after each use 2) Shall be mounted at a height not to exceed 5 feet at the top unless the extinguisher weighs over 40 pounds <ul style="list-style-type: none"> • Then it cannot be mounted over 3½ feet at the top b) Hood systems serviced semi-annually c) New extinguishers d) Extension cords e) Multi-plug device f) Exiting <p>NOTE: Refer to lesson plan on exiting.</p>	<p>Once inside, what should you do first?</p> <p>What are some of the most common discrepancies noted?</p>



FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> g) Hazardous processes <ul style="list-style-type: none"> 1) Woodworking occupancies 2) Spray painting occupancies h) Housekeeping <ul style="list-style-type: none"> 1) Clearance around electrical panels D. Systematic <ul style="list-style-type: none"> 1. Cover entire occupancy 	



FIRE FIGHTER II

SUMMARY:

We have talked about many items that apply to safety inspections - the three good traits of an inspector, starting at the outside, gaining permission to inspect, and the inspection form. This lesson is only a guideline for how an inspection should be completed. There are numerous other items that are looked at during an inspection. Your fire prevention bureau can be more specific on how this is accomplished locally.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Inspection and Code Enforcement, IFSTA, Sixth Edition, Chapter 2 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: BASIC HOME SAFETY INSPECTIONS

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 3-5.1 and SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of basic home safety inspections by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Fire Inspection and Code Enforcement, IFSTA, Sixth Edition, Chapter 2

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials
- Student Information Sheets

REFERENCES:

- Conducting Fire Inspections: A Guidebook For Field Use, NFPA
- Essentials of Fire Fighting, IFSTA, Fourth Edition
- Fire Inspection and Code Enforcement, IFSTA, Sixth Edition
- Learn Not To Burn Curriculum, NFPA

PREPARATION:

"One of the most important phases of a good home inspection program is seeing that fire fighters are properly trained. It is essential that the personnel to be used as inspectors be properly indoctrinated as to what they are expected to accomplish and how they are to accomplish it. If fire fighters are sent out without proper training, it will be impossible to achieve the desired results." *From "Introduction to Fire Prevention" by James C. Robertson.*

Most fatal fires occur in residences. By properly conducting home safety inspections, we can save lives.

PRESENTATION	APPLICATION
<p>D. May be the only fire department contact that people experience</p> <p>IV. ADVANCED PUBLICITY</p> <p>A. Must be a considerable amount given to the program</p> <p>B. Should describe the purposes</p> <p>C. Stress it is voluntary</p> <p>D. Schedules for areas to be covered each day</p> <p>V. DETECTORS</p> <p>A. In new dwellings at least one approved smoke detector powered by the house electric service must be installed in an approved manner in each hallway and each bedroom</p> <p>B. In existing construction or upon sale of an existing dwelling, approved battery powered smoke detectors can be used</p> <p>C. In new construction when one alarm is activated, the detector must initiate all alarms in the dwelling</p> <p>VI. UTILITIES</p> <p>A. All gas, electric, and oil fired utilities and appliances should be kept in good repair and serviced as needed</p> <p>B. Homeowners should be instructed on proper use of electrical extension cords, portable heaters, and wood burning stoves</p>	<p>How do you notify the public of the program?</p> <p>Should homes have smoke detectors?</p> <p>Where must a smoke detector be heard if activated?</p>



FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>VIII. STORAGE OF FLAMMABLE AND COMBUSTIBLE MATERIALS</p> <ul style="list-style-type: none"> A. Flammable and combustible materials within the home should be controlled and kept to a minimum B. Storage away from ignition sources C. Good housekeeping <p>IX. FIRE EXTINGUISHERS</p> <ul style="list-style-type: none"> A. Type and size <ul style="list-style-type: none"> 1. Dry chemical 2. At least a 1A:10B:C B. Location <ul style="list-style-type: none"> 1. In kitchen 2. In garage 	<p>How should flammable and combustible materials be stored?</p>



FIRE FIGHTER II

SUMMARY:

Residential dwellings are our leading locations for fire fatalities. The leading causes of fires in these locations are smoking, heating, cooking, incendiary, electrical distribution systems, appliances, and children playing. Dwelling inspections can affect most of these causes.

Some of the items an engine company must look for are smoke detectors, home escape plans, utility safety, and safety of flammables. Fire extinguishers in the home protect families when accidental fires occur.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Inspection and Code Enforcement, IFSTA, Sixth Edition, Chapter 2 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC:	BENEFITS OF HOME FIRE SPRINKLER SYSTEMS
TIME FRAME:	1:00
LEVEL OF INSTRUCTION:	Level II
AUTHORITY:	1997 NFPA 1001 4-5.1
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of the benefits of a home fire sprinkler system by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Fire Protection Handbook</u> , NFPA, Eighteenth Edition, Section 6, Chapter 13
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials• OSFM Annual CFIRS Report
REFERENCES:	<ul style="list-style-type: none">• <u>Fire in the United States: 1987-1996</u>, FEMA/USFA, Eleventh Edition• <u>Fire Protection Handbook</u>, NFPA, Eighteenth Edition
PREPARATION:	As a fire fighter, on many occasions you will be asked questions by the public regarding the benefits of home fire sprinkler systems. As a professional you need to have information that will help you encourage and support the installation of home fire sprinklers in your community and nationwide.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. FIRE DATA NATIONALLY</p> <p>A. Depending on the data source, 70%-80% of all civilian deaths and injuries in 1996 stemmed from residential fires</p> <p>B. In 1996, the most residential fire deaths occurred between the hours of 11 p.m. and 6 a.m.</p> <p>C. Residential sprinklers are found in under 2% of homes that reported fires in 1996</p> <p>D. In 1996, losses per fire were less when sprinklers operated than where they did not</p> <p>E. More multiple fatality fires occurred in the early morning hours than single fatality fires</p> <p>F. The majority of homes do not have fire extinguishers within the home to extinguish fires that do start</p> <p>II. FIRE DATA – CALIFORNIA</p> <p>NOTE: Current data available from OSFM <u>Annual CFIRS Report</u>.</p> <p>III. BENEFITS</p> <p>A. Life safety</p> <ol style="list-style-type: none"> 1. Provides highest degree currently available 2. Heads operate faster than most commercial heads 	<p>What percentage of fires involves residential buildings?</p> <p>Between what hours do the majority of fire deaths occur?</p> <p>What are the benefits to the homeowner to have residential sprinkler systems built into their residence?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> B. Reduction in government spending <ul style="list-style-type: none"> 1. Smaller fires 2. Less fire fighting equipment C. Insurance savings <ul style="list-style-type: none"> 1. Lower property value loss 2. Lower insurance claim payments 3. Lower insurance premiums in most cases D. Buyer's attitude <ul style="list-style-type: none"> 1. 14%-20% of homebuyers indicated they would only select a home with fire sprinkler systems E. Zoning <ul style="list-style-type: none"> 1. Greater land use may be possible with zoning changes which permit fully sprinklered residences to be built on smaller land parcels F. Building trade-offs <ul style="list-style-type: none"> 1. Many jurisdictions have used building code trade-offs as incentive to the installation of residential sprinkler systems G. Sprinkler legislation <ul style="list-style-type: none"> 1. Many jurisdictions have passed legislation requiring residential sprinkler systems in all new construction H. Mobile homes <ul style="list-style-type: none"> 1. Installing residential sprinkler systems in mobile homes at the factory is becoming more common 	<p>Have residential sprinkler systems been successfully legislated into California law?</p>

PRESENTATION	APPLICATION
<p>IV. COSTS</p> <p>A. Approximately \$1.50 a square foot (currently) for new construction</p> <p>V. <u>NFPA STANDARD #13D</u></p> <p>A. Purpose of this design system is to prevent flashover in room of fire origin</p> <p>B. Provide occupants escape time</p> <p>VI. HOW SYSTEM DIFFERS FROM TRADITIONAL NFPA 13 SYSTEMS</p> <p>A. Uses domestic water</p> <p>B. Unobtrusive heads don't spoil esthetics</p> <p>C. Can use approved plastic pipe</p> <p>D. Local jurisdictions can impose additional requirements not covered by <u>NFPA Standard #13D</u></p>	<p>What is the purpose of a "13D" designed system?</p>



FIRE FIGHTER II

SUMMARY:

With this knowledge on residential sprinkler systems, you will be much better prepared to address the subject when asked for information by the public. The many benefits of residential sprinklers include life safety, insurance savings, and real estate tax deduction. NFPA Standard #13D is the standard for residential fire sprinklers and you need to be aware of the differences between it and NFPA Standard #13.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Fire Protection Handbook, NFPA, Eighteenth Edition, Section 6, Chapter 13 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: FIRE FIGHTER STANDBY/WATCH PROCEDURES

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: SBFS

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of the needs for fire fighter standby procedures by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Uniform Fire Code §2501.19 and 3210, IFCI, 1997 Edition

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Uniform Fire Code, § 2501.19 and 3210, IFCI, 1997 Edition

PREPARATION:

The fire fighters role is to protect life and property. The fire chief may designate a fire fighter to carry out a standby duty at a public assembly event to protect life.

**FIRE FIGHTER II**

PRESENTATION	APPLICATION
<ul style="list-style-type: none">4. Required fire appliances and other fire protection measures are in place and operating properly5. Location of special hazards and adequate clearance between hazard and crowd<ul style="list-style-type: none">a) Fireworks showsb) Rock concertsc) Motion picture special effects6. After fires<ul style="list-style-type: none">a) Rekindlesb) Smokec) Flamesd) Hot spots	



FIRE FIGHTER II

SUMMARY:

The fire fighter may be assigned to standby duty in a public assembly by the fire chief for protecting life and property. The fire chief can require standby duty in a situation such as a place of public assembly due to the nature of the performance, and for the purposes of ensuring that the exits and aisles are clear or the occupant load is not exceeded. It is important to know the procedures to provide proper prevention and protection from fire.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read the Uniform Fire Code §2501.19 and 3210, IFCI, 1997 Edition in order to prepare yourself for the upcoming test. Study for our next session.

FIRE FIGHTER II

TOPIC: FIRE CAUSE DETERMINATION

TIME FRAME: 3:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-3.4

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of fire cause determination by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Essentials of Fire Firefighting, IFSTA, Fourth Edition, Chapter 17

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Essentials of Fire Fighting, IFSTA, Fourth Edition
- Firefighter's Handbook, Delmar, 2000 Edition
- Kirk's Fire Investigation, DeHaan, Fourth Edition

PREPARATION:

Incendiary (arson) fires continue to be a problem in the United States. There is no community immune to incendiary/arson fires. It is important for fire fighters to have the knowledge to identify human intent and the indicators of arson fires to bring these factors to the attention of the fire investigator.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. CAUSES OF FIRE IN CALIFORNIA</p> <p>A. Mechanical failure</p> <ol style="list-style-type: none"> 1. Part failure <ol style="list-style-type: none"> a) Worn b) Break or leak c) Automatic control malfunction 2. Electrical <ol style="list-style-type: none"> a) Short <ol style="list-style-type: none"> 1) Ground fault b) Others 3. Prevention <ol style="list-style-type: none"> a) Inspection of specific part that has a tendency to fail or wear b) Routine testing of parts <p>B. Misuse of heat</p> <ol style="list-style-type: none"> 1. Smoking material 2. Children 3. Unconscious <ol style="list-style-type: none"> a) Sleeping b) Mental impairment c) Chemically impaired 4. Welding operation 5. Open fire 6. Prevention <ol style="list-style-type: none"> a) Public Education 	<p>How can we address the problems from misuse of heat?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 7. Cooking fires <ul style="list-style-type: none"> a) Home kitchen b) Commercial kitchens C. Incendiary acts <ul style="list-style-type: none"> 1. Causes <ul style="list-style-type: none"> a) Deliberate and malicious 2. Prevention <ul style="list-style-type: none"> a) Investigation b) Public education D. Other acts <ul style="list-style-type: none"> 1. Causes <ul style="list-style-type: none"> a) Animals b) Rekindles 2. Prevention <ul style="list-style-type: none"> a) Constructing and modifying equipment to keep animals away b) Total extinguishment E. Suspicious acts <ul style="list-style-type: none"> 1. Causes <ul style="list-style-type: none"> a) Possibility of being deliberately set 2. Prevention <ul style="list-style-type: none"> a) Investigation b) Public education F. Operation deficiencies <ul style="list-style-type: none"> 1. Cause <ul style="list-style-type: none"> a) Collision overturn, knockdown b) Accidentally turn on or off 	<p>What are some other causes of fires?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> c) Unattended d) Overloaded e) Design alteration 2. Prevention <ul style="list-style-type: none"> a) Public education b) Prevention inspection G. Misuse of material ignited <ul style="list-style-type: none"> 1. Causes <ul style="list-style-type: none"> a) Flammable liquid <ul style="list-style-type: none"> 1) Improper uses 2) Accidental release or spill b) Improper container c) Improper storage d) Children playing 2. Prevention <ul style="list-style-type: none"> a) Public education b) Learn Not to Burn program H. Construction deficiencies <ul style="list-style-type: none"> 1. Causes <ul style="list-style-type: none"> a) Design b) Construction c) Installation 2. Prevention <ul style="list-style-type: none"> a) Plan check b) On site inspections during construction 	<p>Do children intentionally set fires?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. Natural causes</p> <ol style="list-style-type: none"> 1. Earthquake 2. High wind 3. Floods 4. Lightning <p>II. THE UNUSUAL AND UNNATURAL</p> <p>A. Look for things that are not right, out of place, not normal</p> <ol style="list-style-type: none"> 1. Obstructions 2. Windows and doors opened or closed contrary to weather conditions 3. Occupants dressed wrong for time of day or night 4. Fire burning in two separate locations at the same time 5. Speed of the fire spread 6. Fire protection systems inoperable <p>III. FIRES PRECEDED BY APPARENT PREPARATION</p> <p>A. Multiple considerations</p> <ol style="list-style-type: none"> 1. The fire was started when the weather conditions were bad 2. Obstructions used to hinder fire fighting operations 3. Items of value removed prior to fire 4. Fire protection devices inoperable <p>B. Removal of personal items</p> <ol style="list-style-type: none"> 1. An arsonist may remove personal items prior to setting the fire 	<p>What would you take before setting a fire?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ol style="list-style-type: none"> 2. In some cases the arsonist will remove only his or her belongings and leave the belongings of his or her spouse 3. Look for removal of <ol style="list-style-type: none"> a) Clothing b) Personal records and papers c) Guns d) Television e) Stereo equipment f) Tools g) Car from the garage h) Computer i) Other 4. Fires destroying obsolete, unusable, or unsellable contents <ol style="list-style-type: none"> a) An arsonist may set a fire for personal benefit <ol style="list-style-type: none"> 1) To collect the insurance b) Items that you cannot sell c) Unusable contents 5. Peculiar locations and conditions of burning <ol style="list-style-type: none"> a) Look for peculiar locations of the fire <ol style="list-style-type: none"> 1) Under the building 2) Under stairways 3) On a porch or entryway 4) Center of floor 5) Closet 6) Stairs 7) Trash bins 8) Vacant buildings 	

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>9) Top of beds</p> <p>10) Pile of clothing</p> <p>6. Look for peculiar conditions of burning</p> <p>a) Faster than normal</p> <p>b) Fires in several locations of the same building</p> <p>c) Tell the investigator what you found</p> <p>7. Furniture and appliances</p> <p>a) An arsonist will rearrange contents prior to setting a fire</p> <p>1) Furniture moved to burn more completely</p> <p>2) Furniture moved to block means of entry</p> <p>3) Electrical appliances in suspicious locations</p> <p>4) Fires where damaged or pre-burned contents are found</p> <p>b) Overhaul operations must be kept to a minimum</p> <p>1) Do not destroy evidence</p> <p>IV. FIRES IN VACANT BUILDINGS</p> <p>A. The fire fighter should be suspicious of fires in any vacant building</p> <p>1. Buildings for sale</p> <p>2. Buildings abandoned</p> <p>3. Buildings being renovated</p>	<p>Can you name others you have seen?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ol style="list-style-type: none"> 1. Multiple fires <ol style="list-style-type: none"> a) Notice if there are fires in several different locations b) Different points of origin c) Trailers Incendiary devices d) Trailers 2. Flammable liquids <ol style="list-style-type: none"> a) Any unusual odors that are not common in structural fires b) Patterns 3. Area of most severe burning <ol style="list-style-type: none"> a) Look in areas of severe burning for indicators of intentional setting b) This is usually the area of origin 4. Fire damage to ceiling and floor areas <ol style="list-style-type: none"> a) Ceiling and roof rafters will be most damaged directly above the point of origin b) Floors <ol style="list-style-type: none"> 1) Deepest charring will indicate point of origin 2) Look in this area for evidence of intentionally set fires 5. Undue wood charring <ol style="list-style-type: none"> a) Look for excessive charring in a particular area b) May give you an area of origin 6. Uneven wood charring <ol style="list-style-type: none"> a) Would be an indication of area of origin b) Or an indication that a flammable liquid was used 	

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> b) Oil or gas lines deliberately damaged c) Flammable materials stored too close <p>12. Containers used for flammable liquids</p> <ul style="list-style-type: none"> a) May have been used to spread the flammable liquid to accelerate the fire <ul style="list-style-type: none"> 1) Inform fire investigator about these containers b) May be located a short distance from scene <p>13. Residues of wax or paraffin</p> <ul style="list-style-type: none"> a) Could be an indication that a candle was used to start the fire b) Remember that a burning candle or one in a fire situation will lose its physical characteristics, but the wax and paraffin remains <p>14. There are two general types of V-shaped burn patterns</p> <ul style="list-style-type: none"> a) Normal wall burn patterns is in the shape of "V" b) Inverted "V" pattern on wall indicates that a flammable liquid may have been used 	
<p>VII. ARSON MATERIALS AND EQUIPMENT</p> <p>A. The following materials and equipment can be used as evidence and should not be overlooked or destroyed</p> <ul style="list-style-type: none"> 1. Trailers between fires <ul style="list-style-type: none"> a) Trailers are usually ordinary combustibles b) Sometimes soaked with flammable liquids <ul style="list-style-type: none"> 1) Toilet paper 	<p>What would be some materials/equipment used to start fires?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 2) Black gunpowder 3) Excelsior 4) Dynamite fuses 5) String soaked in cooking oil 6) Rope soaked in kerosene 7) Cotton 8) Paper and similar material <p>2. Candles</p> <ul style="list-style-type: none"> a) Most frequently used timing devices b) Wax from candles will often soak into the floor and is usually detected on-scene or in a lab <p>3. Matches</p> <ul style="list-style-type: none"> a) Most common source of fire ignition <ul style="list-style-type: none"> 1) Are not always consumed by the fire 2) Even if they are, the staple from a matchbook will remain b) Unburned matchbooks could carry fingerprints <ul style="list-style-type: none"> 1) Handle with care <p>4. Chemicals</p> <ul style="list-style-type: none"> a) Be aware that chemicals are used in setting fires <ul style="list-style-type: none"> 1) Phosphorous 2) Metallic sodium 3) Potassium 4) Mermanganate 5) Glycerine 	

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>8. Glass and magnifying glass</p> <ul style="list-style-type: none"> a) Glass can be used to focus the sun's rays, as well as magnifying glass b) These items are more commonly used in wildland fires than structural fires <p>9. Bottles</p> <ul style="list-style-type: none"> a) Bottles are used to hold flammable liquids <ul style="list-style-type: none"> 1) Molotov Cocktails b) You may find unburned cloth in the neck c) Some remains of the bottle can always be found d) Plastic bottles melt into pool <p>10. Unusual gadgets and timing devices</p> <ul style="list-style-type: none"> a) Contraceptives b) Toy balloons c) Hot water bottles and similar rubber items d) Plastic bags used to hold flammable liquids or phosphorous and water e) Timing devices <ul style="list-style-type: none"> 1) Cigarette-match combination and candles are the most commonly used timing devices 2) The metal parts of alarm clocks are seldom destroyed by fire 	<p>How would bottles be used to aid with intentional fires?</p>

PRESENTATION	APPLICATION
<p>11. Electrical equipment</p> <ul style="list-style-type: none"> a) Some of the electrical causes <ul style="list-style-type: none"> 1) Electrical heating appliances purposely put into contact with common combustibles 2) Deliberate overloads b) Low-watt light bulbs are not likely to set fire to clothes or other material in closets or attics, but they can if wrapped and burned in combustibles so the heat cannot dissipate 	<p>How can electricity be used to intentionally set fires?</p>
<p>VIII. ROLE OF LAW ENFORCEMENT</p> <ul style="list-style-type: none"> A. Outside agencies <ul style="list-style-type: none"> 1. Law enforcement <ul style="list-style-type: none"> a) Local police b) Sheriff c) Highway patrol 2. Coroner - call for any death 3. Arson Investigators <ul style="list-style-type: none"> a) Fire Department Investigators b) Local Arson Task Force Team c) California Department of Forestry and Fire Protection/State Fire Marshal Arson and Bomb Investigators 	<p>Is it important to ask for assistance from outside agencies?</p>



FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none">d) Bureau of Alcohol, Tobacco and Firearms (ATF) Investigatorse) Insurance Investigators <p>B. After suppressing a suspicious fire, fire fighters should remain on-scene until law enforcement arrives to protect evidence and establish a clear chain of evidence</p>	



FIRE FIGHTER II

SUMMARY:

First responders' initial observations provide investigators with information pertinent to the investigation. As the investigation unfolds, these observations may provide the starting point for evidence collection and preservation efforts. Fires of accidental cause need to be identified so that dangerous practices, such as filling kerosene room heaters with gasoline, can be eliminated by public education. Defective or dangerous products, such as instant-on televisions or room heaters with no overheating or tip-over protection, can be taken off the market or modified so they no longer pose a significant fire risk. Fires of incendiary (i.e., deliberate) cause must be detected, so that the fire setter can be intercepted before doing more harm and punished as necessary.

Fire suppression and rescue efforts can be performed more efficiently and effectively if only essential authorized personnel are permitted access to the area. Fire investigation begins as the fire fighter leaves the station. Such things as weather, time of day, color of smoke, and type of crowd area all indicators of fire cause. Once on-scene, other indicators such as broken windows, jimmied doors, flammable liquid trailers, and the like are all things the first responder should be aware.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Essentials of Fire Firefighting, IFSTA, Fourth Edition, Chapter 17 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC:	TYPES OF BUILDING CONSTRUCTION
TIME FRAME:	1:00
LEVEL OF INSTRUCTION:	II
AUTHORITY:	1997 NFPA 1001 3-3.11 and SBFS
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of the types of building construction by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Firefighter's Handbook</u> , Delmar, 2000 Edition, Chapter 13
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials
REFERENCES:	<ul style="list-style-type: none">• <u>Building Construction for the Fire Service</u>, Francis L. Brannigan, Third Edition• <u>Collapse of Burning Buildings</u>, Vincent Dunn• <u>Firefighter's Handbook</u>, Delmar, 2000 Edition
PREPARATION:	In a building involved in a fire, many physical as well as chemical changes occur simultaneously. An important factor to be considered is the effect of the failure of one material on the strength of another. For example, the expansion of a steel beam may cause collapse of an otherwise sound wall. A brick wall may twist away from a fire and let down the ends of the floor joists built into it. The floor joists, which originally gave lateral stiffening to a wall may burn out or collapse, and pull down the wall into which they were built. This knowledge may help the fire officer determine when to evacuate the roof or interior, saving fire fighter's lives.

PRESENTATION	APPLICATION
<p>I. THE 5 BASIC TYPES OF CONSTRUCTION</p> <p>A. Type I - Fire Resistive</p> <ol style="list-style-type: none"> 1. That type of building construction in which the structural members, including walls, partitions, columns, floors and roofs are of non-combustible or limited combustible materials and have fire resistive ratings as may be required 2. Used when maximum fire safety is required <p>B. Type II - Noncombustible</p> <ol style="list-style-type: none"> 1. Construction in which walls, partitions and structural members are of non-combustible material, but does not qualify as fire resistive 2. Weakness is in unprotected steel building components <p>C. Type III - Ordinary Construction (brick and joist)</p> <ol style="list-style-type: none"> 1. Construction in which exterior bearing walls or bearing portions of exterior walls are of non-combustible or limited combustible materials and have a minimum hourly fire resistive rating and stability under fire conditions 2. Also known as exterior protected combustible construction <p>D. Type IV - Heavy Timber</p> <ol style="list-style-type: none"> 1. Construction where bearing walls and bearing portions of walls are non-combustible and have a minimum fire resistive rating of two hours, as well as stability under fire conditions 2. Columns, beams, and girders are commonly heavy timber with wood floors and roof construction built without concealed spaces 	<p>What are the basic types of construction?</p> <p>Why is this important to fire fighters?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>E. Type V - Wood Frame</p> <ol style="list-style-type: none"> 1. Construction in which exterior walls, bearing walls and partitions, floors, roofs and their supports are wholly or partially constructed of wood or other combustible materials <p>II. SPECIFIC FIRE SPREAD OR COLLAPSE HAZARDS ASSOCIATED WITH EACH TYPE OF CONSTRUCTION.</p> <p>A. Type I</p> <ol style="list-style-type: none"> 1. Live load and openings in the building allowing for fire spread <p>B. Type II</p> <ol style="list-style-type: none"> 1. Weakening and collapse of unprotected steel building supports, weight of HVAC components of roof <p>C. Type III</p> <ol style="list-style-type: none"> 1. Concealed spaces, wooden support components of floors and roofs, masonry constructed walls that can collapse <p>D. Type IV</p> <ol style="list-style-type: none"> 1. Roof structures built of combustible materials, no concealed spaces, many variations of roof support structures 	<p>Why is it important for fire fighters to understand the fire spread characteristics of each of the building construction types?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>E. Type V</p> <ol style="list-style-type: none"> 1. Combustible bearing walls <p>III. MIXED TYPES OF CONSTRUCTION</p> <ol style="list-style-type: none"> A. Requirements based on meeting one or more of these five types of construction B. Must be considered to have the collapse and fire spread characteristics of the least fire resistive components C. Many jurisdictions have varied requirements as to fire prevention measures and firefighters need to know how buildings are not only constructed in their response area, but what fire prevention measures are in place <p>IV. FIRE RESISTANCE REQUIREMENTS FOR TYPES OF CONSTRUCTION</p> <ol style="list-style-type: none"> A. Table 17-A UBC B. <u>NFPA Standard #220</u> 	<p>What are some examples of mixed type construction?</p>

**SUMMARY:**

There are five basic construction types. Type I, II, III, IV, and V. Type I being the most resistant and Type V being the least. Fire resistive requirements for types of construction are found in Table 17.A UBC and NFPA 220. Type V is most common, being wood.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Firefighter's Handbook, Delmar, 2000 Edition, Chapter 13 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC:	STRUCTURAL FEATURES THAT MAY INFLUENCE FIRE SPREAD AND SAFETY
TIME FRAME:	3:00
LEVEL OF INSTRUCTION:	Level I
AUTHORITY:	1997 NFPA 1001 3-5.2 and SBFS
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of those structural features that may influence fire spread and safety by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Firefighter's Handbook</u> , Delmar, 2000 Edition, Chapter 13
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials
REFERENCES:	<ul style="list-style-type: none">• <u>Firefighter's Handbook</u>, Delmar, 2000 Edition
PREPARATION:	Of the many unknown factors confronting the fire fighter arriving at the scene of a building involved in fire, the one factor that can be changed with the greatest degree of accuracy is the building itself. However, the time to gather the necessary information is before the fire occurs.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 3. Enclosure wall 4. Exterior wall 5. Fire partition wall 6. Fire wall 7. Parapet wall 8. Nonbearing wall 9. Partition 10. Party wall 11. Cavity wall 12. Faced wall 13. Hollow wall 14. Sandwich wall <p>IV. CEILING</p> <ul style="list-style-type: none"> A. Has no structural role B. It supports only its own weight and weight of attached fixtures C. Fire resistance of ceilings D. Hidden spaces <p>V. ROOF COVERINGS</p> <ul style="list-style-type: none"> A. The combustibility of the surface of a roof is of concern to the entire community B. To have a good understanding of what routes fire may take, another structural feature which should be addressed is roof coverings C. Types of roof coverings <ul style="list-style-type: none"> 1. Classified A, B, C 2. Sheet metal 3. Clay tile 	<p>What types of coverings may you find?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 2. Permit rapid spread of fire if not enclosed 3. Even if enclosed, they do not stop vertical spread of smoke <p>E. Elevator doors</p> <ul style="list-style-type: none"> 1. Functions 2. Emergency operations <p>F. Emergency operations</p> <ul style="list-style-type: none"> 1. Never press the button for the fire floor <p>VII. STAIRWAYS</p> <p>A. Function</p> <p>B. Types</p> <ul style="list-style-type: none"> 1. Exterior 2. Interior 3. Return 4. Straight run 5. Access 6. Scissor 7. Winding 8. Partial 9. Moving <p>VIII. EXITING</p> <p>A. Enclosed</p> <ul style="list-style-type: none"> 1. Protected stairs enclosed with fire rated construction <p>B. Fire escape</p> <ul style="list-style-type: none"> 1. New construction no longer allowed by code 2. Steel balconies and stairs mounted on exterior wall 	

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>IX. SMOKE-PROOF ENCLOSURES</p> <ul style="list-style-type: none"> A. Stairway enclosures that have exterior balconies or vestibules open to the outside air or those with smoke shafts are known as smoke-proof enclosures B. Requirements C. Functions D. Advantages to fire fighters <p>X. UTILITY CHASES AND VERTICAL SHAFTS</p> <ul style="list-style-type: none"> A. Define types B. Describe fire spread C. Unprotected vertical openings <p>XI. DOOR ASSEMBLIES</p> <ul style="list-style-type: none"> A. Doors can be a hindrance to fire fighting operations B. It is imperative that fire fighters have an understanding of door construction C. Types of doors <ul style="list-style-type: none"> 1. Swinging 2. Sliding 3. Rolling 4. Fire <ul style="list-style-type: none"> a) Sliding b) Swinging c) Fire ratings (ASTM) d) Operations 	<p>How can fire behavior be influenced with regard to door assemblies and structural makeup?</p>



FIRE FIGHTER II

SUMMARY:

Fire fighters face many dangers in the line of duty. Among them is the unknown structural stability of buildings they must enter under fire conditions. The lexicon of tragic fire service deaths is filled with entries bearing the sad legend, "building collapse."

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Firefighter's Handbook, Delmar, 2000 Edition, Chapter 13 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: DETERMINING OCCUPANCY TYPES

TIME FRAME: 2:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-5.2

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of how to determine the various occupancy types by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Uniform Building Code, ICBO, 1997 Edition, Chapter 3

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials

REFERENCES:

- Fire Inspection and Code Enforcement, IFSTA, Sixth Edition
- Uniform Building Code, ICBO, 1997 Edition, with California Amendments

PREPARATION:

In order to perform company life safety inspections, you must be able to readily identify the occupancy type to adequately enforce the proper code sections. Fire prevention is the mainstay of the fire service and is vital for both the safety of the occupants as well as the fire fighters.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 3. Building/professional or service type C. Group E occupancies <ul style="list-style-type: none"> 1. Divided by grade and hours of instruction 2. Educational <ul style="list-style-type: none"> a) Schools b) Day care 3. E1 occupancy <ul style="list-style-type: none"> a) Any building used for educational purpose through the 12th grade <ul style="list-style-type: none"> 1) More than 4 hours in any one day or 12 hours per week 2) 50 or more occupants 4. E2 occupancy <ul style="list-style-type: none"> a) Same as E1 but less than 50 occupants 5. E3 occupancy <ul style="list-style-type: none"> a) Day care for more than 6 children D. Group F occupancies <ul style="list-style-type: none"> 1. F1 occupancy <ul style="list-style-type: none"> a) Moderate hazard factory and industrial 2. F2 occupancy <ul style="list-style-type: none"> a) Low hazard factory and industrial E. Group H occupancies <ul style="list-style-type: none"> 1. Divided by the severity of the hazard 2. Hazardous <ul style="list-style-type: none"> a) Manufacturing b) Processing c) Storage of high fire, explosion, or health hazards 	<p>What are the Group E occupancies?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 3. H1 occupancy <ul style="list-style-type: none"> a) Storage, handling, use, or sale of hazardous and highly flammable or explosive material 4. H2 occupancy <ul style="list-style-type: none"> a) Storage, handling, use, or sale of Class I, II, III-A liquids b) Paint shops/auto body 5. H3 occupancy <ul style="list-style-type: none"> a) Woodworking establishments, shops, or factories where loose combustibles are generated 6. H4 occupancy <ul style="list-style-type: none"> a) Repair garages not classified as B1 7. H5 occupancy <ul style="list-style-type: none"> a) Aircraft repair hangar not classified as B3 8. H6 occupancy <ul style="list-style-type: none"> a) Semiconductor manufacturing 9. H7 occupancy <ul style="list-style-type: none"> a) Highly toxic materials F. Group I occupancies <ul style="list-style-type: none"> 1. Divided by level of care and amount of restricted movement 	<p>Within Group H, where does an auto body shop belong?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 2. I1 occupancy <ul style="list-style-type: none"> a) Nurseries caring for five or more children less than six years old 3. I1.2 occupancy <ul style="list-style-type: none"> a) Ambulatory healthcare/outpatient facilities with five or more patients 4. I2 occupancy <ul style="list-style-type: none"> a) Nursing homes with five or more ambulatory patients six years or older 5. I3 occupancy <ul style="list-style-type: none"> a) Mental hospitals b) Jails c) Restrained inmates G. Group M occupancies <ul style="list-style-type: none"> 1. Mercantile <ul style="list-style-type: none"> a) Display and sale of merchandise b) Retail stores, etc. H. Group R occupancies <ul style="list-style-type: none"> 1. Divided by type of dwelling unit 2. R1 occupancy <ul style="list-style-type: none"> a) Hotels b) Apartments c) Dwellings 3. R2.1 occupancy 	<p>What are some Group I occupancies?</p> <p>What occupancy classification is a jail?</p> <p>What types of buildings are classified as Group R?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> a) Residential care facility for the elderly, nonambulatory 4. R2.2 occupancy <ul style="list-style-type: none"> a) Residential care facility for the elderly, ambulatory 5. R3 occupancy <ul style="list-style-type: none"> a) Dwellings and lodging with housing ten or less residents 6. R6.1 occupancy <ul style="list-style-type: none"> a) Halfway house, nonambulatory residents 7. R6.2 occupancy <ul style="list-style-type: none"> a) Halfway house, ambulatory residents I. Group S occupancies <ul style="list-style-type: none"> 1. Repair garages 2. Storage warehouses 3. S1 occupancy <ul style="list-style-type: none"> a) Moderate hazard storage occupancies 4. S2 occupancy <ul style="list-style-type: none"> a) Low hazard storage occupancies 5. S3 occupancy <ul style="list-style-type: none"> a) Repair garages <ul style="list-style-type: none"> 1) No open flame or welding 6. S4 occupancy <ul style="list-style-type: none"> a) Open parking garage 7. S5 occupancy <ul style="list-style-type: none"> a) Aircraft hangars b) Helispot 	<p>What kinds of occupancies are classified as Group S?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>J. Group U occupancies</p> <ol style="list-style-type: none"> 1. Private garages 2. Agriculture 3. Tanks 4. Towers 5. U1 occupancy <ol style="list-style-type: none"> a) Private garage b) Carport c) Shed d) Agricultural building 6. U2 occupancy <ol style="list-style-type: none"> a) Fences over six feet b) Tanks c) Towers 	<p>Does a fence have an occupancy classification?</p>



FIRE FIGHTER II

SUMMARY:

The ability of a fire fighter to quickly recognize the nine occupancy types by their letter and number designations aids in their ability to efficiently inspect different occupancies as well as giving the engine company knowledge of what they might expect when responding to an emergency. Knowing the difference that the load of combustibles in an elementary school would not be expected to be as high as in a warehouse. A Group H1 (storage, handling of hazardous and highly flammable or explosive materials) is much different from a Group H6 occupancy (semiconductor manufacturing). The occupancy classification can be defined as the use to which owners or tenants put all or a portion of a building. Being able to recognize occupancies with ambulatory vs. nonambulatory persons will help with the maximum allowable occupancy in private assisted living residences. Fire personnel must have a versatile personality that allows them to interact favorably with a wide variety of people.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Uniform Building Code, ICBO, 1997 Edition, Chapter 3 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC:	BUILDING CONSTRUCTION FEATURES
TIME FRAME:	2:00
LEVEL OF INSTRUCTION:	Level II
AUTHORITY:	NFPA 1001 3-3.9, 3-3.11, 4-3.2, and SBFS
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of building construction by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Firefighter's Handbook</u> , Delmar, 2000 Edition, Chapter 13
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials
REFERENCES:	<ul style="list-style-type: none">• <u>Building Construction for the Fire Service</u>, Francis L. Brannigan, Third Edition• <u>Fire Inspection and Code Enforcement</u>, IFSTA, Sixth Edition• <u>Firefighter's Handbook</u>, Delmar, 2000 Edition
PREPARATION:	The knowledge of building construction and how it relates to the fire service is the foundation for determining forcible entry, ventilation, and decisions whether to make an interior attack or exterior defensive operations. Time is essential in fireground operations. Making the appropriate decision could save time resulting in greater property conservation and a safer fireground operation.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ol style="list-style-type: none"> 2. Heavy timber construction has quite good fire resistive properties and, though severely charred, is often found in place after intense fire 3. The various types of wood burn at slightly different rates (oak, fir pine, mahogany, etc.) <ol style="list-style-type: none"> a) This factor is of less importance than <ol style="list-style-type: none"> 1) The unit size of the lumber 2) The tightness and rigidity of the joints 3) The surface area exposed 4) Relationship of the wood in conjunction with other materials 4. Wood has some definite advantages, it does not <ol style="list-style-type: none"> a) Expand b) Spall c) Soften when exposed to heat 5. These factors reduce the possibility of sudden collapse due to the cooling effect of hose streams 	
<p>B. Metals</p> <ol style="list-style-type: none"> 1. A number of different kinds of metals are used in building construction <ol style="list-style-type: none"> a) Only iron and steel are commonly used for those structural parts designed to carry any load b) The metals used in the construction of a building are not combustible and present no risk of fire spread by direct burning 	<p>What are the most common types of metal used in building construction today?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> c) Unprotected metal surfaces may, however, constitute a serious risk in a fire d) All metals absorb heat when exposed to fire and are a potential contributor to fire spread by conduction e) Unprotected metal, when used to carry a structural load, also presents a serious hazard of sudden collapse when excessively heated f) Further causes of collapse may occur when heat expanded metal is cooled by hose streams g) Structural steel possesses both high compressive strength and high tensile strength which makes it an ideal building material for heavy construction <ul style="list-style-type: none"> 1) It will however, expand and become distorted at relatively low fire temperatures 2) This inherent defect in steel may be reduced by covering with fire resistive material 3) As the components expand they twist often shearing the bolts which originally held them in place 4) As long as they are heated they may remain wedged in place 5) Collapse occurs when these structural items contract due to cooling during suppression 	<p>What are the advantages to steel as a construction material?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>C. Concrete</p> <ol style="list-style-type: none"> 1. An excellent building material 2. Low thermal conductivity 3. Highly fire resistive 4. Durable and strong 5. Suitable for use in many parts of a structure 6. Concrete has ten times more strength when under compression than when subjected to tension 7. Concrete is also used in block form in tilt-up type of construction 8. Moisture in concrete expands when heated and cracks - spalling <p>D. Brick</p> <ol style="list-style-type: none"> 1. Brick has excellent fire resistive qualities 2. An important advantage of brick lies in the fact that it is used in small units and, when exposed to heat will expand at the joints without destroying the brick itself 3. Where an inferior mixture of mortar is used at the joints, the heat of the fire may cause uneven expansion of brick at the joints to such an extent as to throw the entire wall out of plumb and cause collapse <p>E. Building boards</p> <ol style="list-style-type: none"> 1. Various materials in sheet form are employed for covering walls and ceilings 2. These may be either combustible or non-combustible 3. The difference in rates of spread of fire will be greatly affected by the covering of walls and ceilings 	<p>Why do contractors use sheeting material?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>4. The building boards may be non-combustible such as sheet rock, or combustible such as plywood or paneling for walls and celotex for ceilings</p> <p>III. STRUCTURAL COMPONENTS</p> <p>A. Columns</p> <ol style="list-style-type: none"> 1. Carry a part of the weight of the building 2. Positioned vertically <p>B. Girders</p> <ol style="list-style-type: none"> 1. Supported by columns 2. Positioned horizontally <p>C. Beams</p> <ol style="list-style-type: none"> 1. Cantilever <ol style="list-style-type: none"> a) Supported on one end 2. Simple <ol style="list-style-type: none"> a) Supported at both ends 3. Continuous <ol style="list-style-type: none"> a) Supported at both ends and in the center 4. Positioned horizontally <p>D. Truss assemblies</p> <ol style="list-style-type: none"> 1. Floor or roof assemblies 2. Three common types <ol style="list-style-type: none"> a) Bowstring b) Peaked c) Parallel Chord (flat) 3. Commonly wood with metal fasteners <ol style="list-style-type: none"> a) Lightweight – "gang nails" or cleats b) Timber truss – Metal plates and bolts 	

PRESENTATION	APPLICATION
<p>4. Tend to fail quickly</p> <p>IV. FOUNDATION ASSEMBLIES</p> <p>A. Footings</p> <ol style="list-style-type: none"> 1. Built below grade 2. Serve as support for walls, posts, piers, etc. <p>B. Pilings</p> <ol style="list-style-type: none"> 1. Used to support footings 2. Foundation walls in poor soil conditions <p>C. Floating foundation</p> <ol style="list-style-type: none"> 1. Extremely low bearing capacity 2. For stability may be used in conjunction with pilings <p>D. Underpinnings</p> <ol style="list-style-type: none"> 1. Used to temporarily support a weakening foundation <p>V. FOUNDATION WALLS</p> <p>A. To transfer the weight of a structure to the footings</p> <p>B. Piers and columns</p> <p>C. Functional components</p> <ol style="list-style-type: none"> 1. Floor deck <ol style="list-style-type: none"> a) Plywood 	<p>What is one of the main concerns of truss construction?</p> <p>What common building components do footings provide support for?</p> <p>What is the importance of foundation walls?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> b) Plank c) Concrete 2. Supporting joists <ul style="list-style-type: none"> a) Wood b) Concrete c) Steel d) Wood/steel trusses 3. Girders <ul style="list-style-type: none"> a) Heavy wood beams b) Steel beams c) Concrete D. Concrete floors <ul style="list-style-type: none"> 1. Poured in place <ul style="list-style-type: none"> a) Formed at construction site b) Reinforced with steel 2. Precast <ul style="list-style-type: none"> a) Transported to construction site b) Slabs, beams 3. Prestressed <ul style="list-style-type: none"> a) Impose a compressive force on the concrete prior to application of loads E. Steel supported floors <ul style="list-style-type: none"> 1. Concrete slabs supported by beams 2. Concrete slabs on steel decks supported by steel bar joists 	<p>With what type of materials are girders constructed?</p>

PRESENTATION	APPLICATION
<p>F. Wood flooring</p> <ol style="list-style-type: none"> 1. Fundamental disadvantage of being combustible 2. Trusses <ol style="list-style-type: none"> a) Wood b) Wood and steel c) Burn and fail more quickly than solid wood members 3. Laminated beams <ol style="list-style-type: none"> a) "Glue lams" are the most common b) Constructed in lengths up to 100 feet 4. Box beams <ol style="list-style-type: none"> a) Composite beams made with vertical plywood webs b) Provide a high strength-to-weight ration 5. Wooden I-beams <ol style="list-style-type: none"> a) Plywood stem b) Wood top and bottom chords c) Fabricated with nails, bolts, glue, or combinations of any or all d) Stem has cut-outs for HVAC and electrical plumbing e) Cut-outs may allow fire spread between beams <p>VI. CEILINGS</p> <ol style="list-style-type: none"> A. Assemblies <ol style="list-style-type: none"> 1. No structural role 	<p>What problem is associated with the use of wood trusses?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 2. Voids <ul style="list-style-type: none"> a) Allows for concealed area fires 3. Suspended over existing ceilings <ul style="list-style-type: none"> a) More concealed spaces 4. Fire stops in large areas <ul style="list-style-type: none"> a) Building codes require large areas to be divided <p>VII. WALL CONSTRUCTION</p> <p>A. Exterior walls</p> <ul style="list-style-type: none"> 1. Masonry load-bearing walls <ul style="list-style-type: none"> a) Brick b) Concrete block c) Stone d) Combinations of the above e) Provide fire-resistance of 2-4 hours f) Wall thickness from 6-20 inches 2. Tilt-up concrete <ul style="list-style-type: none"> a) A single panel can weigh 20 tons 3. Wood frame construction <ul style="list-style-type: none"> a) All interior construction components are wood b) Only building construction type with combustible bearing walls 	<p>Masonry load-bearing walls may be constructed of what type of materials?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> b) Contributes to fire extension by flame spread over its surface c) Adds to the intensity by contributing additional fuel d) Produces smoke and toxic gases if combustible or decomposes with heat <p>2. Steiner tunnel test</p> <ul style="list-style-type: none"> a) Determines surface burning characteristics b) Surface combustibility translated to a number known as a "flame spread rating" c) Lower rating means less hazard 	<p>What type of test is used to determine a "flame spread rating?"</p>
<p>VIII. ROOFS</p> <p>A. Concerns</p> <ul style="list-style-type: none"> 1. Will it support fire fighters? 2. Combustibility of its surface 3. Possibility of a fire originating within the roof space 4. Likelihood of a fire traveling through the concealed roof spaces <p>B. Coverings</p> <ul style="list-style-type: none"> 1. Class A <ul style="list-style-type: none"> a) Asphalt-asbestos felt sheets 4-ply thick 	<p>What concerns do fire fighter's have with roofs?</p> <p>What are some of the types of roof coverings?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 3. Joists/beams 4. Trusses 5. Rigid frames 6. Arches 7. Domes 8. Cables E. Joists/beams <ul style="list-style-type: none"> 1. Solid wood 2. Manufactured <ul style="list-style-type: none"> a) Truss style b) I-beam c) Precast concrete F. Trusses <ul style="list-style-type: none"> 1. Parts <ul style="list-style-type: none"> a) Top chord b) Bottom chord c) Web members d) Gusset plates/gang nails e) Metal or wood plates affixed with nuts and bolts or nails 2. Styles <ul style="list-style-type: none"> a) Parallel chord (flat) b) Bowstring (arched) c) Peaked G. Arches <ul style="list-style-type: none"> 1. Support roofs with large clear spaces 	<p>What are the parts of a truss?</p>



FIRE FIGHTER II

SUMMARY:

Building materials affect the way buildings react to fire. No building is fireproof only fire resistive. Materials used in building construction have varied fire resistance and the strengths and weaknesses of common building materials must be identified. Wood has advantages in that it does not soften, spall, expand, or contract when exposed to fire, however it can pose a threat when used in light wood construction, especially in trusses. Metals used in building construction often fail very early due to loss of temper. Metals can, however, be made more fire-resistive with the use of a variety of materials, from fire-resistive coating to the use of materials like sheetrock, lath, and plaster. The structural components of columns, girders, and beams support all or part of the weight of the building, their stability depending on their construction material as well as exposure to fire. Beam stability varies with the construction types of cantilever, simple, or continuous. The three common types of truss construction — peaked, bowstring, and parallel chord — must be identified more quickly than virtually any other building component due to collapse risks.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Firefighter's Handbook, Delmar, 2000 Edition, Chapter 13 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC: PRE-INCIDENT PLANNING

TIME FRAME: 1:00

LEVEL OF INSTRUCTION: Level II

AUTHORITY: 1997 NFPA 1001 4-5.1

BEHAVIORAL OBJECTIVE:

Condition: A written test

Behavior: The student will confirm a knowledge of pre-incident planning by completing the written test

Standard: With a minimum 80% accuracy according to the information contained in the Firefighter's Handbook, Delmar, 2000 Edition, Chapter 21

MATERIALS NEEDED:

- Writing board with markers/erasers
- Appropriate audiovisual equipment
- Appropriate audiovisual materials
- Local pre-incident planning text

REFERENCES:

- Firefighter's Handbook, Delmar, 2000 Edition

PREPARATION:

The pre-incident plan could make the difference between life and death. Fire fighters have the responsibility to know their jurisdiction and prepare for emergencies. This lesson can assist you in that task.

PRESENTATION	APPLICATION
<p>I. TARGET HAZARD</p> <ul style="list-style-type: none"> A. Facility, structure, operation, process, or situation that may produce or propagate a fire or related emergency B. This may involve large fire loss, heavy life loss, personal injury, or significant damage <p>II. PRIORITIZATION OF THE PRE-INCIDENT PLANNING PROCESS</p> <ul style="list-style-type: none"> A. Inventory municipal exposures B. Evaluate the exposures C. Prioritize for pre-incident planning <p>III. INFORMATION GATHERING</p> <ul style="list-style-type: none"> A. Collect desired information B. Organize it into usable data C. Format it into desired criteria D. Review information to assure sufficient information is obtained E. If insufficient, redo the process; if sufficient, move on <p>IV. GENERAL INFORMATION REQUIREMENTS</p> <ul style="list-style-type: none"> A. Address B. Date of inspection C. Occupancy type 	<p>How do you prioritize the pre-incident planning process?</p> <p>How do you gather the information needed for pre-incident planning?</p> <p>What general information should be considered in each pre-incident plan?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> D. Business name E. Name and address of occupant F. Name and address of owner G. Materials of construction H. Dollar stock concentration I. Utilization J. Obstructions K. Exposures L. Water supply M. Fire protection systems N. Tactical concerns O. Potential nonfire emergencies P. Plot plan Q. Utilities R. Basements/cellars <p>V. CONTENTS OF STRUCTURE</p> <ul style="list-style-type: none"> A. Critical issue for fire officers and fire fighters is knowing hazardous materials are stored or used within a structure <p>VI. RIGHT TO KNOW</p> <ul style="list-style-type: none"> A. Enables emergency service personnel and/or the general public to obtain information regarding what hazardous materials are used or stored within various occupancies in your community 	<p>What are the "right to know" laws?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>VII. DATA</p> <ul style="list-style-type: none">A. Health hazardsB. Physical hazardsC. Exposure control informationD. Reference materialE. Location and type of hazardF. Labeling standards <p>VIII. UPDATE</p> <ul style="list-style-type: none">A. Annual update is recommended by ISOB. As needed<ul style="list-style-type: none">1. New occupancies2. Change of ownership/management3. Change in fire suppression capabilities	<p>What data should be gained during the pre-plan process for hazardous materials?</p>



FIRE FIGHTER II

SUMMARY:

Pre-incident planning for emergencies is based on a series of factors that identify a target hazard. A target hazard is a facility, structure, operation, process, or situation that may produce or propagate a fire or related emergency. Pre-incident planning includes type of occupancy, type of incident expected, life hazards, nature of activities conducted at occupancy, exposure to surrounding areas, complexity of fire fighting operations, and resources required. A site inspection will provide information that will allow emergency responders to deal effectively with all levels of situations at the site. Following the site inspection, a diagram will be drawn that shows all the important issues including floor and site plans along with hazards are illustrated. A standard set of map symbols should be used. Following completion of the pre-incident plan documents, they should be placed in the command vehicles and all apparatus, and not just left in an inaccessible computer file.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Firefighter's Handbook, Delmar, 2000 Edition, Chapter 21 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC:	DRAWINGS AND SKETCHES OF BUILDINGS FOR PRE-INCIDENT PLANNING
TIME FRAME:	0:30
LEVEL OF INSTRUCTION:	Level I
AUTHORITY:	1997 NFPA 1001 4-5.1
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of the need for and components of drawings and sketches of buildings for pre-incident planning by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Firefighter's Handbook</u> , Delmar, 2000 Edition, Chapter 21
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials
REFERENCES:	<ul style="list-style-type: none">• <u>Firefighter's Handbook</u>, Delmar, 2000 Edition
PREPARATION:	Drawings and sketches of buildings are vitally important. They provide needed information about a specific building that may take valuable time to find otherwise. Drawings should be simple and easy to read with all necessary information.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. DRAWINGS</p> <p>A. Building</p> <ol style="list-style-type: none"> 1. Dimensions <ol style="list-style-type: none"> a) Length b) Width c) Height <ol style="list-style-type: none"> 1) Feet 2) Floors 3) Basements/cellars 2. North arrow 3. Area plan <p>B. Fire protection</p> <ol style="list-style-type: none"> 1. Sprinklers <ol style="list-style-type: none"> a) Fire department connection b) PIVs, OS&Ys, and/or double detector check valves c) Indicator panel 2. Heat, smoke indicator panel 3. Any special systems <ol style="list-style-type: none"> a) Hood b) Vault c) Halon 	<p>What indicator should appear on all geographic maps and plot plans?</p> <p>What fire protection items can be shown on a drawing of a building?</p>

PRESENTATION	APPLICATION
<p>C. Hydrants</p> <ol style="list-style-type: none"> 1. Size 2. Flow 3. Locations <p>D. Shutoffs</p> <ol style="list-style-type: none"> 1. Electrical 2. Gas 3. Water 4. Any special to the building <p>E. Special hazards</p> <ol style="list-style-type: none"> 1. Material 2. Processes 3. Guard dogs 4. Locked gates <p>F. Miscellaneous information</p> <ol style="list-style-type: none"> 1. Vertical shafts 2. Elevators 3. Skylight 4. Roof vents 5. Heavy equipment on roof <p>II. FORMAT</p> <p>A. The format should be easy to interpret with minimum detail to confuse the reader</p> <p>B. Use standard symbols</p> <ol style="list-style-type: none"> 1. NFPA, Section 22, Chapter 21 	<p>What types of shutoffs are there?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>C. Building plans</p> <ol style="list-style-type: none">1. Plot<ol style="list-style-type: none">a) Show relationships of building, street, exposures, water supply2. Floor<ol style="list-style-type: none">a) For each floor, show rooms, walls, doors, key access points3. Roof<ol style="list-style-type: none">a) Show location of all objects4. Tactical<ol style="list-style-type: none">a) Show tactical approach to incident	



FIRE FIGHTER II

SUMMARY:

A critical component of a pre-incident plan is the sketch or drawing that comprises the target hazard. To facilitate continuity drawings, sketches, maps, and plot plans should use a standardized set of symbols. Buildings should be standardized as to dimensions of length, width, height, and arrow for North. Fire protection systems need to be properly noted. Standard symbols should be utilized based on NFPA standards. Building plans need to illustrate the overall plot, floor plan, roof issues, and tactical approach.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Firefighter's Handbook, Delmar, 2000 Edition, Chapter 21 in order to prepare yourself for the upcoming test. Study for our next session.

TOPIC:	RECOGNITION, COLLECTION, AND PRESERVATION OF EVIDENCE
TIME FRAME:	1:00
LEVEL OF INSTRUCTION:	Level II
AUTHORITY:	1997 NFPA 1001 4-3.4
BEHAVIORAL OBJECTIVE:	
Condition:	A written test
Behavior:	The student will confirm a knowledge of the way evidence is recognized, collected, and preserved in a fire investigation situation by completing the written test
Standard:	With a minimum 80% accuracy according to the information contained in the <u>Firefighter's Handbook</u> , Delmar, 2000 Edition, Chapter 20, <u>Fire and Arson Scene Evidence</u> , U.S. Department of Justice, 2000, and <u>Essentials of Fire Fighting</u> , IFSTA, Fourth Edition, Chapter 17
MATERIALS NEEDED:	<ul style="list-style-type: none">• Writing board with markers/erasers• Appropriate audiovisual equipment• Appropriate audiovisual materials
REFERENCES:	<ul style="list-style-type: none">• <u>Essentials of Fire Fighting</u>, IFSTA, Fourth Edition• <u>Fire and Arson Scene Evidence</u>, U.S. Department of Justice, June 2000• <u>Firefighter's Handbook</u>, Delmar, 2000 Edition
PREPARATION:	The fire fighter at the scene of a fire will be the person most likely to first discover evidence. You must know how to protect this evidence or you will be the first person to destroy it.

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. OBSERVE AND MENTALLY NOTE EVIDENCE THAT MAY BE PRESENT AT THE SCENE</p> <ul style="list-style-type: none"> A. Fire patterns <ul style="list-style-type: none"> 1. Including multiple fire locations B. Victims <ul style="list-style-type: none"> 1. Burn injuries 2. Fire patterns on clothing C. Trailers, ignitable liquids, or other unusual fuel distribution <ul style="list-style-type: none"> 1. Piles of newspapers 2. Furniture pushed together D. Incendiary, ignition, or explosive devices <ul style="list-style-type: none"> 1. Lighters 2. Matches 3. Timing devices E. Shoe prints F. Tire impressions G. Broken windows and doors H. Distribution of broken glass and debris I. Indications of forced entry <ul style="list-style-type: none"> 1. Tools and tool marks J. Containers K. Discarded clothing L. Trace evidence <ul style="list-style-type: none"> 1. Hairs 2. Fibers 3. Fingerprints 	<p>What different forms of evidence might you find at the fire scene?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 4. Blood 5. Other body fluids M. Evidence of crimes in addition to the possible arson <ul style="list-style-type: none"> 1. Weapons 2. Bodies 3. Drugs 4. Clandestine drug laboratory equipment N. Witnesses O. Bystanders P. Any other unusual items or the absence of normal contents or structural components <p>II. RECOGNIZE THREATS TO EVIDENCE</p> <ul style="list-style-type: none"> A. Fire suppression activities may wash away or dilute potential evidence <ul style="list-style-type: none"> 1. Straight stream applied at the point of origin 2. Deluge applications B. Overhaul activities <ul style="list-style-type: none"> 1. Destroy fire patterns C. Salvage activities <ul style="list-style-type: none"> 1. Moving or removing potential physical evidence D. Use of a tool in any manner that causes destruction of evidence E. Movement of knobs, switches, and controls on appliances and utilities 	<p>Can fire fighting efforts adversely affect the overall investigation of a fire scene?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>F. Weather conditions that affect transient evidence</p> <ol style="list-style-type: none"> 1. Wind 2. Precipitation 3. Temperature changes <p>G. Personnel walking through the scene</p> <p>H. Witnesses and victims leaving the scene</p> <p>I. Medical intervention and treatment of victims</p> <ol style="list-style-type: none"> 1. Damaging evidence at the scene 2. Destroying victims' clothing <p>J. Premature removal or movement of bodies</p> <p>K. Vehicles at the scene</p> <ol style="list-style-type: none"> 1. Introduce fluid to the scene through vehicle leaks 2. Destroy other evidence <ol style="list-style-type: none"> a) Shoe prints b) Tire impressions <p>L. Contamination from external sources</p> <ol style="list-style-type: none"> 1. Fuel-powered tools or equipment <p>III. PROTECTION OF EVIDENCE</p> <p>A. Limit excessive fire suppression, overhaul, and salvage</p> <p>B. Avoid needless destruction of property</p> <p>C. Avoid touching or moving any evidence</p> <p>D. If you touch it, report this fact to the investigator</p> <p>E. Leave bodies undisturbed</p>	<p>Should we move a body to continue with salvage and overhaul operations?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> F. Evidence should be photographed as you found it, where you found it, in the condition you found it G. Flag items of evidence with cones or markers H. Record observations through written notes or voice recordings I. Cover items or areas containing evidence with objects that will not contaminate the evidence <ul style="list-style-type: none"> 1. Clean boxes 2. Tarpaulins J. Isolating items or areas containing evidence <ul style="list-style-type: none"> 1. Rope 2. Barrier tape 3. Barricades K. Retain and secure clothing items removed from victims and suspects L. Obtain information about victims and witnesses <ul style="list-style-type: none"> 1. Names 2. Addresses 3. Telephone numbers M. Preserve transient evidence <ul style="list-style-type: none"> 1. Trace evidence 2. Shoe prints 3. Tire impressions N. Remove evidence at risk of imminent destruction by the fire or the structural collapse of the damaged building O. Ensure that later arriving investigators are fully apprised of the evidence discovered 	<p>What are some ways to protect and preserve evidence?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>IV. EVIDENCE OF INCENDIARY FIRES</p> <p>A. Presence of accelerants</p> <ol style="list-style-type: none"> 1. Any fuel arranged specifically to increase the spread of fire 2. Ignitable liquids are often used to accelerate fires 3. Recognize odors associated with ignitable liquids <ol style="list-style-type: none"> a) Gasoline b) Kerosene c) Paint thinner 4. Presence of ignitable liquids at scene could be a safety factor in ignition 5. Be alert for strange odors that could mask the odor of ignitable liquids 6. Behavior of ignitable liquids during extinguishments <ol style="list-style-type: none"> a) Flashbacks, re-ignition, or several rekindles in the same area may be an indicator of ignitable liquids b) Care must be taken to identify synthetic materials that are associated with furniture as they often leave indicators similar to ignitable liquids 	<p>What is an accelerant?</p> <p>Could presence of ignitable liquid residues be a safety factor?</p> <p>What are some factors that are typical when water is used to extinguish fires in ignitable liquids?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>B. Obstacles placed to purposely hinder fire fighting efforts</p> <ol style="list-style-type: none"> 1. Anything placed or attached to hinder fire fighters from accomplishing their task <ol style="list-style-type: none"> a) Furniture stacked to impede entry or movement in the scene b) Piles of material placed adjacent to entry or passageways c) Extra locks or bars <p>C. Incendiary devices, trailers, accumulations of combustibles</p> <ol style="list-style-type: none"> 1. Incendiary devices <ol style="list-style-type: none"> a) Any item used to start or enhance the ignition of a fire 2. Trailers <ol style="list-style-type: none"> a) Flammable or combustible materials utilized to spread the fire from one area to another <p>NOTE: Identify some materials that could be used as trailer materials.</p> <p>D. Removal of fire resistive coverings over structural components</p> <ol style="list-style-type: none"> 1. Plaster or sheetrock removed over combustible wall components 2. Holes in ceilings, walls, and floors <ol style="list-style-type: none"> a) To permit fire to extend rapidly into structural components of building 	<p>What types of obstacles may be utilized?</p> <p>What is a trailer?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none"> 3. Fire doors propped open <ul style="list-style-type: none"> a) To allow fire to breach fire wall early b) Fire doors are normally closed or are self-closing E. Unusual destruction without a fire load to support it <ul style="list-style-type: none"> 1. Destruction extensive in one area 2. Destruction extends through floors, walls, and doors without reason 3. Could be an area of origin <ul style="list-style-type: none"> a) Protect these areas and notify officer in charge or investigator F. Heat and smoke levels <ul style="list-style-type: none"> 1. Follow patterns left by the fire <ul style="list-style-type: none"> a) Fire spread normally upward and outward b) Follow patterns from high to low c) Least damage to areas of greatest destruction d) Smoke damage to heat damage to char G. Speed of spread <ul style="list-style-type: none"> 1. With today's modern furnishings, fires can develop their maximum heat release potential within short periods of time <ul style="list-style-type: none"> a) Due to increased fuel loads b) Due to synthetic materials 2. Traditional fires with cellulosic materials and less fuel loads did not develop maximum heat release as quickly as do the fires of today 	<p>Why must door be propped open?</p> <p>What should be done with these areas?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>3. Old theories of fires that develop maximum heat release in a short period of time have to be incendiary cannot be used based only on extreme rate of spread, due to the combustion properties of synthetics</p> <p>H. Inoperable protection systems</p> <p>1. Fire protection systems may have been tampered with or intentionally damaged</p> <ul style="list-style-type: none"> a) Turned off b) Broken c) Plugged d) Removed e) Opened <p>2. Examples of systems</p> <ul style="list-style-type: none"> a) Sprinkler b) Alarms c) Fire doors d) Water systems e) Hydrants f) Hoselines g) Smoke detectors h) Telephones <p>3. Burglar alarm tampered with or damaged</p> <ul style="list-style-type: none"> a) Look at scene for signs of theft 	<p>How could a fire protection system be made inoperable?</p> <p>Can you name some systems?</p>

FIRE FIGHTER II

PRESENTATION	APPLICATION
<p>I. Fires in unusual places</p> <ol style="list-style-type: none"> 1. If fire is in unusual location consider how heat source and fuel came together to start fire 2. Unusual locations <ol style="list-style-type: none"> a) Empty closet b) Under bed c) Under floor d) Center of bed e) Center of empty room 3. What heat source would cause fire <ol style="list-style-type: none"> a) Electrical b) Mechanical c) Chemical <p>J. Absence of possessions</p> <ol style="list-style-type: none"> 1. Every occupancy has normal amounts of possessions for the standard of living associated with that occupancy 2. Look around and identify what is present and note the absences 3. In a dwelling fire look for absence of <ol style="list-style-type: none"> a) Clothing b) Entertainment appliances c) Guns d) Photographs e) Other 4. In business fire look for absence of <ol style="list-style-type: none"> a) Stock b) Money 	<p>What are some unusual locations for fire to occur?</p>



FIRE FIGHTER II

PRESENTATION	APPLICATION
<ul style="list-style-type: none">c) Filesd) Equipmente) Personal belongings	



FIRE FIGHTER II

SUMMARY:

Evidence on the scene of a fire can be indications of cause and origin. Fire fighters, if not careful, may destroy this evidence letting the arsonist off. Fire fighters need to utilize reduced water, limit overhaul and do not remove anything necessary to be moved. By being aware of signs and symptoms of arson, the fire fighter can be a great aide to the arson investigator.

EVALUATION:

The student will complete the written test at a time determined by the instructor.

ASSIGNMENT:

Review your notes and read Firefighter's Handbook, Delmar, 2000 Edition, Chapter 20, Fire and Arson Scene Evidence, U.S. Department of Justice, 2000, and Essentials of Fire Fighting, IFSTA, Fourth Edition, Chapter 17 in order to prepare yourself for the upcoming test. Study for our next session.



FIRE FIGHTER II

NAME:			
	TOPIC	TIME	APPROVED INSTRUCTOR INITIALS and DATE
UNIT A	FIRE SERVICE ORGANIZATION AND RESPONSIBILITY	All information for this unit is received in Fire Fighter I	
UNIT B	MISCELLANEOUS EQUIPMENT AND TOOLS	All information for this unit is received in Fire Fighter I	
UNIT C	FIRE BEHAVIOR AND EXTINGUISHMENT THEORY	All information for this unit is received in Fire Fighter I	
UNIT D	FIRE FIGHTER SAFETY	1:45	
1.	Specialized protective equipment	0:45	
2.	Procedures for positioning fire engines at an emergency scene	1:00	
UNIT E	SELF-CONTAINED BREATHING APPARATUS	All information for this unit is received in Fire Fighter I	
UNIT F	PORTABLE FIRE EXTINGUISHERS	All information for this unit is received in Fire Fighter I	
UNIT G	ROPES, KNOTS, AND HITCHES	All information for this unit is received in Fire Fighter I	
UNIT H	HOSE, NOZZLES, AND APPLIANCES	4:00	
1.	How to make an intake pump connection using a 2½" hoseline	0:30	
2.	How to make an intake pump connection using large diameter hose	1:00	
3.	How to make a four-way hydrant valve connection	1:00	
4.	Procedures for testing fire hose	1:00	
5.	Procedures for maintaining hose records	0:30	
UNIT I	GROUND LADDERS	All information for this unit is received in Fire Fighter I	
UNIT J	FORCIBLE ENTRY	All information for this unit is received in Fire Fighter I	
UNIT K	RESCUE	21:00	
1.	Electrical emergencies	0:15	
2.	Escalator emergencies	0:15	
3.	Components of elevators	0:45	
4.	Elevator safety awareness	0:15	
5.	Procedures for elevator extrication	0:30	
6.	Procedures for converting an elevator from independent to emergency service	0:15	
7.	Industrial accidents	0:15	
8.	Cave, tunnel, and mine rescue awareness	0:30	
9.	Water and ice rescue awareness	1:00	
10.	Trench rescue operations awareness	2:00	
11.	Assisting rescue operations at an incident	0:15	
12.	Considerations for tunneling through debris	1:00	
13.	Basic considerations for constructing shafts in debris	1:00	
14.	Considerations for debris removal from a collapsed building	1:00	
15.	Emergencies requiring rope rescue techniques	0:15	
16.	Basic rope rescue safety	0:15	
17.	Characteristics and functions of rescue/life safety hardware	0:30	
18.	Inspection and maintenance of rescue/life hardware	0:15	
19.	How to tie a pelvic harness	0:15	
20.	How to secure a victim to a rescue litter using the chest, pelvic, and exterior lash methods	0:30	
21.	How to rig a rescue litter for raising or lowering a victim in a horizontal position	0:15	
22.	Introduction to anchor systems	0:30	
23.	How to tie a lark's foot anchor sling	0:15	
24.	How to tie a single loop anchor sling	0:15	
25.	How to tie a 3-bight anchor sling	0:15	
26.	How to tie a multi-loop anchor sling	0:15	
27.	How to tie a full strength tie off	0:15	

FIRE FIGHTER II

NAME:			
	TOPIC	TIME	APPROVED INSTRUCTOR INITIALS and DATE
28.	How to construct a back-tied anchor system	0:15	
29.	How to construct a two-point self-adjusting anchor system	0:30	
30.	How to construct a three-point self-adjusting anchor system	0:30	
31.	Introduction to the belay system	0:30	
32.	How to construct and operate a belay system	0:30	
33.	Introduction to the rack, pulley, mariner's hitch (RPM)	0:15	
34.	How to attach a prusik loop to a RPM for use as a ratchet device in a haul system	0:15	
35.	How to attach a three-wrap prusik hitch to a rescue rope	0:15	
36.	How to attach and operate a figure eight descender as part of a RPM	0:15	
37.	How to attach a Gibbs ascender to a RPM for use as a ratchet device in a haul system	0:15	
38.	How to attach and operate a brake bar rack as part of a RPM	0:15	
39.	How to construct and operate a mariner's hitch as part of a RPM	0:30	
40.	Introduction to rope rescue lowering and raising systems	1:00	
41.	How to construct and operate a lowering system	0:45	
42.	Mechanical advantage systems using the 3:1 piggy back and 3:1 z-rig, including directional changes	0:15	
43.	How to construct a z-rig raising system	0:30	
44.	How to construct a 3:1 piggy back raising system	0:30	
45.	How to change a lowering system to a raising system (z-rig)	0:15	
46.	Personal protective equipment for rescue scenarios	0:15	
UNIT L	VENTILATION	All information for this unit is received in Fire Fighter I	
UNIT M	FIRE CONTROL	2:15	
1.	Strategy and tactics at emergencies	1:00	
2.	Factors that determine the size and type of fire stream needed	0:30	
3.	Safety precautions when advancing hoselines into fire areas	0:15	
4.	Causes of poor foam generation	0:30	
UNIT N	SALVAGE AND OVERHAUL	All information for this unit is received in Fire Fighter I	
UNIT O	FIRE PROTECTION WATER SYSTEMS	4:30	
1.	Types of apparatus and equipment needed for providing water at rural locations	0:30	
2.	Procedures for water shuttle operations	0:30	
3.	Methods used to determine water system flow pressure	0:30	
4.	How to use a pitot tube	0:30	
5.	Methods for determining fire hydrant discharge capacity	1:00	
6.	Causes of pressure loss in water systems	1:00	
7.	How to maintain wet and dry barrel hydrants	0:30	
UNIT P	FIRE PROTECTION SYSTEMS	1:00	
1.	Features of a supervised fire alarm system	1:00	
UNIT Q	FIRE PREVENTION AND INVESTIGATION	19:30	
1.	Fire incident reports	1:00	
2.	Company fire inspection reports	1:00	
3.	Procedures for performing routine company fire inspections	1:00	
4.	Basic home safety inspections	1:00	
5.	Benefits of home fire sprinkler systems	1:00	
6.	Fire fighter standby/watch procedures	1:00	



FIRE FIGHTER II

NAME:			
	TOPIC	TIME	APPROVED INSTRUCTOR INITIALS and DATE
7.	Fire cause determination	3:00	
8.	Types of building construction	1:00	
9.	Structural features that may influence fire spread and safety	3:00	
10.	Determining occupancy types	2:00	
11.	Building construction features	2:00	
12.	Pre-incident planning	1:00	
13.	Drawings and sketches of buildings for pre-incident planning	0:30	
14.	Recognition, collection, and preservation of evidence	1:00	
UNIT R	COMMUNICATIONS	All information for this unit is received in Fire Fighter I	
UNIT S	VEHICLE EXTRICATION	All information for this unit is received in Fire Fighter I	
UNIT T	WILDLAND FIRE FIGHTING	All information for this unit is received in Fire Fighter I	
UNIT U	EMERGENCY CARE	All information for this unit is received in Fire Fighter I	
UNIT V	INCIDENT COMMAND SYSTEM	All information for this unit is received in Fire Fighter I	
UNIT W	CONFINED SPACE RESCUE OPERATIONS	32:00	
	Complete a Confined Space Rescue Operations course	32:00	
UNIT X	HAZARDOUS MATERIALS	All information for this unit is received in Fire Fighter I	
	HOURS:	86:00	Plus manipulative performance lab and testing