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**AUTHOR** Hagevig, William A.; Gallagher, Leigh S.  
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## ABSTRACT

This firefighter training guide for a 180-hour course was developed to assist training officers in planning training with emphasis on conformance to recommended National Fire Protection Association (NFPA 1001) standards. The material in the guide is referenced to current editions of the International Fire Service Training Association manuals and other suggested resources. The first of two major sections, Model Learning Guide, is divided into one- to four-hour segments, each containing a course outline and a lesson plan. The course outline describes the class to be taught, the drill setting needed, and the objectives to be met, and details the resources and materials needed to teach the class. The lesson plan offers the actual presentation, which may be used by the instructor, along with recommendations for setting up the drill, and the task performance reference numbers. Section 2, Task Performance Criteria, is composed of sixty-two tasks which are completely referenced both to the course segment numbers of the guide and to the NFPA 1001 Firefighter One requirements. (LRA)

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STATE OF ALASKA  
DEPARTMENT OF EDUCATION  
FIRE SERVICE TRAINING PROGRAM  
JUNEAU, ALASKA

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MODEL TRAINING GUIDE  
FIREFIGHTER I LEVEL

U.S. DEPARTMENT OF HEALTH,  
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FIRE SERVICE TRAINING PROGRAM  
WILLIAM A. HAGEVIG, SUPERVISOR  
LEIGH S. GALLAGHER, COORDINATOR

JULY 1, 1979

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## **MODEL TRAINING GUIDE Firefighter I Level**

As part of the effort to reduce fire loss in the State of Alaska, the office of Fire Service Training recognized the need for a model training guide which could be used by any fire department to organize its own training system. The following guide was developed to assist training officers in planning training with emphasis on conformance to recommended national standards (NFPA 1001). The accreditation requirements have been divided primarily into one and two hour segments for a total of 180 hours. The Basic First Aid requirements (20 hours) have not been included; the local jurisdiction having control shall make the decision as to what course will meet both local requirements and those of the standard.

Each segment of the training guide lists the topic objectives, instructor references, materials and equipment needed, description of what is to be accomplished, drill setting, and a lesson plan for the actual presentation. They are presented here to be used as a guide in planning a well-rounded program to improve fire department efficiency as well as to more clearly define Firefighter I requirements.

Some segments will not apply to all fire departments. In such cases, the training officer is encouraged to revise or develop replacements more closely fitting the needs of the individual department. Exposure to all the topics should be encouraged, however. Departments should have some knowledge of all the subject areas, although they may not have the particular equipment, apparatus, or facilities used.

As noted above, this material is presented as a guide for developing and implementing local training programs. Revisions will be made from time to time to insure currency and to improve the content. Any suggestions you may have will be helpful.

**William A. Hagevig, Supervisor  
Fire Service Training Program**

## MODEL TRAINING GUIDE CONFERENCE

The Firefighter I Model Training Guide was completed with the assistance of a number of individuals who contributed their time and expertise during the Model Training Guide Conference. The office of Fire Service Training acknowledges the value of their contributions in the development of a comprehensive training program designed specifically for the fire service of Alaska.

Edward C. Bosco, Jr.  
Nenana Volunteer Fire Department  
P.O. Box 293  
Nenana, Alaska 99760

Gordon Buess  
Wrangell Volunteer Fire Department  
P.O. Box 676  
Wrangell, Alaska 99929

James Evans  
Anchorage Municipal Fire Department  
211 W. Seventh Avenue  
Anchorage, Alaska 99501

Alan Judson  
Juneau Volunteer Fire Department  
820 Glacier Avenue  
Juneau, Alaska 99801

Jack M. Mason  
Glacier Volunteer Fire Department  
R.R. 6, Box 3505  
Juneau, Alaska 99803

Thomas W. Monk  
Glacier Volunteer Fire Department  
R.R. 6, Box 3505  
Juneau, Alaska 99803

Carl Mulvihill  
Skagway Volunteer Fire Department  
P.O. Box 415  
Skagway, Alaska 99840

Basil J. (Bud) Sands  
Fairbanks Fire Department  
656 Seventh Avenue  
Fairbanks, Alaska 99701

David Unruh  
Nikiski Volunteer Fire Department  
P.O. Box 1167  
Kenai, Alaska 99611

Dewey Whetsell  
Cordova Volunteer Fire Department  
P.O. Box 34  
Cordova, Alaska 99574

Fred Wood  
Valdez Volunteer Fire Department  
Box 307  
Valdez, Alaska 99686



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## TEXT REFERENCES

The material in the Model Training Guide is referenced to current editions of the International Fire Service Training Association (IFSTA) manuals and other suggested supplemental instructor resources. From time to time, as texts are replaced by newer editions, you can expect the training guide segments to be revised accordingly. If your texts differ from those referred to here, it will be necessary to adjust the page numbers in the instructor reference sections. It is suggested that you compare the edition numbers of your IFSTA manuals with those listed below. It is definitely recommended that training be conducted out of current edition manuals.

<u>IFSTA</u>		<u>EDITION</u>
#101	Forcible Entry, Rope, and Portable Extinguisher Practices	5th
#102	Fire Service Ground Ladder Practices	7th
#103	Fire Hose Practices	6th
#104	Salvage and Overhaul Practices	5th
#105	Fire Stream Practices	5th
#106	Fire Apparatus Practices	5th
#107	Fire Ventilation Practices	5th
#108	Fire Service Rescue and Protective Breathing Practices	4th
#109	Fire Service First Aid Practices	5th
#110	Fire Prevention and Inspection Practices	4th
#200	Essentials of Firefighting	1st
#201	Fire Service Practices for Volunteer Fire Departments	5th
#202	Fire Service Orientation and Indoctrination	1st
#203	Fire Service Training Programs	2nd
#205	Water Supplies for Fire Protection	2nd
#206	Aircraft Fire Protection and Rescue Procedures	1st
#208	Records and Reports for the Fire Service	1st
#301	The Fire Department Officer	2nd
#302	Fire Department Facilities, Planning, and Procedures	2nd
#303	Fire Service Instructor Training	3rd
#304	Fire Problems in High Rise Buildings	1st
#401	Fundamental Principles of Mathematics Applied to the Fire Service	3rd
#402	Fundamental Principles of Science Applied to the Fire Service	3rd
#403	Leadership in the Fire Service	1st
#501	IFSTA Source Material Reference Guide 1974	1st

Fire Protection Handbook, National Fire Protection Association 14th

National Fire Codes, National Fire Protection Association 1975-76

Alaska National Fire Incident Reporting System (ANFIRS)

Automatic Sprinkler and Standpipe Systems, Dr. John L. Bryan

Fire Service Communications for Fire Attack, Warren Kimball

**Text References (page 2)**

**Fundamentals of Fire Prevention, William Bare**

**Introduction to Fire Prevention, James Robertson**

**Uniform Building Code, 1979 edition**

## **FIREFIGHTER I COURSE DESCRIPTION**

The Alaska Firefighter I training course package as presented herein consists of two sections:

1. **Model Training Guide** - This unit is divided into one- to four-hour segments, each containing a course outline and a lesson plan.
  - A. The course outline (printed on white paper) describes the class to be taught, the drill setting needed, the objectives to be met, and details the resources and materials needed to teach the class.
  - B. The lesson plan (printed on yellow paper) offers the actual presentation which may be used by the instructor, along with recommendations for setting up the drill, and the task performance reference numbers. Where no task performance reference number is given, the applicable NFPA 1001 requirement is cited at the bottom of the final page.
2. **Task Performance Criteria** - This unit is composed of 62 tasks which are completely referenced both to the course segment numbers of the Model Training Guide and to the NFPA 1001 Firefighter I requirements. These tasks must be performed satisfactorily by the applicant firefighter following classroom instruction and prior to certification at the Firefighter I level. All tasks applicable to the fire department having jurisdiction must be performed to the appropriate standards as written. Documentation to this effect must be submitted to the Supervisor of Fire Service Training as a condition of Certification. (See Certification of Task Performance Requirements form, p. iii, Task Performance Criteria)

Each topic in the Model Training Guide is designed as a self-contained unit, so that the topics do not have to be taught in a particular sequence. It is recommended, however, that all lessons within a particular topic (i.e., FFI-9, Fire Streams) be taught as a unit and preferably in sequence.

## TRAINING GUIDE INDEX

FFI - 2	Fire Department Organization	4 hours
FFI - 3	Fire Apparatus	4 hours
FFI - 4	Fire Behavior and Portable Fire Extinguishers	12 hours
FFI - 5	Forcible Entry and Rope	12 hours
FFI - 6	Ladders	12 hours
FFI - 7	Hose, Nozzles and Appliances	20 hours
FFI - 8	Salvage and Overhaul	14 hours
FFI - 9	Fire Streams	20 hours
FFI - 10	Ventilation	12 hours
FFI - 11	Rescue and Breathing Apparatus	20 hours
FFI - 12	Fire Prevention and Inspection Practices	18 hours
FFI - 13	Fire Alarms and Communications	6 hours
FFI - 14	Sprinkler and Standpipe Systems	6 hours

**Total 160 hours\***

\* Course requirements for FFI - 1 (Basic First Aid) as approved by the local jurisdiction having control will be accepted for certification provided the curriculum meets or exceeds 20 clock hours.



## **FFI - 2 FIRE DEPARTMENT ORGANIZATION**

**FFI - 2A Fire Department Organization**

**2 hours**

**FFI - 2B Fire Department History**

**2 hours**

**Total 4 hours**

## **FFI - 2A "FIRE DEPARTMENT ORGANIZATION"**

### **TIME:**

**2 hours**

### **OBJECTIVES:**

**Develop a basic understanding of the following:**

- Local department standard operating procedures**
- Local Policies**
- Personnel duties and responsibilities**
- Chain of command**

### **INSTRUCTOR REFERENCES:**

- 1. Department Standard Operating Procedures**
- 2. Local Rules and Regulations**

### **DESCRIPTION OF DRILL:**

**This drill should emphasize the operation of the fire department; city rules and regulations; personnel policies; trainee duties and responsibilities; conditions of employment; the job; hours; compensation; training; self-improvement; and promotion.**

### **DRILL SETTING:**

**This drill should be held in the classroom and oriented to give an overview of the employing fire department's relationship to the community.**

## **FFI - 2A "FIRE DEPARTMENT ORGANIZATION"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To familiarize the student with the local fire department, providing him with the basic knowledge and understanding of his role in the fire department, conditions of employment, rules and regulations, his responsibilities at emergencies and during normal work periods, and a basic overview of his relationships within the organization.

### **COVERAGE:**

Personnel policies; operation of the local fire department; trainee duties and responsibilities; conditions of employment; the job; hours; compensation; training; self-improvement; and promotion.

### **MATERIALS:**

1. Department Standard Operating Procedures
2. Personnel policies
3. Department rules and regulations
4. Chain of command chart
5. Union
6. Miscellaneous forms, handout materials, etc. (Items the instructor feels necessary in providing his student with the knowledge necessary to meet the objectives listed above.)

### **PREPARATION:**

1. Develop or make ready an organizational chart
2. Make ready handout materials
3. Study and be prepared to answer questions relating to the handout material
4. Make ready a suitable classroom area

**INTRODUCTION:**

Provide the student with a brief look at the history of structured fire service organizations and emphasize the need for a semi-militaristic organization with a high level of discipline and structure. Cite examples during emergency situations where rules, regulations, and a working knowledge of a member's authority and responsibilities proved vital.

**PRESENTATION:**

1. Welcome students to your department
2. Present and explain the organizational chart
3. Discuss and explain chain of command
4. Distribute personnel policies. (If lengthy, have the student study them prior to next session.)
5. Distribute Department Standard Operating Procedures. (If lengthy, have the student study them prior to next session.)
6. Discuss conditions of employment, the trainee's duties and responsibilities, and compensation
7. Discuss future training sessions within the basic firefighter course, and your department's training program in general
8. Provide the students with time to ask questions relating to their employment, and/or this lesson

**EVALUATION:**

Through a written or oral examination, students should be able to demonstrate their knowledge of:

- A. Organizational chart
- B. Department Standard Operating Procedures
- C. Personnel policies
- D. Conditions of employment
- E. Duties and responsibilities
- F. Training program

## FFI - 2B "FIRE DEPARTMENT HISTORY"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Departmental history and tradition
- Development and organization
- Departmental activities and services

### INSTRUCTOR REFERENCES:

Research of departmental history

### DESCRIPTION OF DRILL:

This drill should emphasize the department's history, traditions; development and organization; employment activities and services; community facilities and obligations; and participation in community activities.

### DRILL SETTING:

This drill should be held in the classroom and oriented to give an overview of the employing fire department's relationship to the community.



## **FFI - 2B "FIRE DEPARTMENT HISTORY"**

### **TIME:**

**2 hours**

### **OBJECTIVES:**

**To familiarize the student with department history, organizational development, and community activities, services, and obligations as related to the fire department.**

### **COVERAGE:**

**Historical documents of the fire department; organizational charts, past and present; community activities; and the fireman's role in his community.**

### **MATERIALS:**

- 1. Historical Documents**
  - A. Records**
  - B. Pictures**
  - C. News media releases**
  - D. Enabling Ordinance**
- 2. List of community service organizations**
- 3. Chalkboard, chalk**

### **PREPARATION:**

- 1. Collect and review historical documents**
- 2. Research and make ready information about your community services**
- 3. Make ready a suitable classroom area**

### **INTRODUCTION:**

**Provide the students with a look at several interesting developments throughout your department's history, showing how each affected your organization and the community you protect. Have your students suggest other community or department developments which affected your fire department.**

**PRESENTATION:**

1. Discuss the founding of your department
  - A. Date
  - B. Persons behind the creation of your department
  - C. Need for fire protection (define fire protection)
  - D. Manning
  - E. Equipment
  - F. Facility
2. Organizational Development
  - A. Manpower development
  - B. Equipment development
  - C. Facility development
  - D. Funding structure
3. Community Service Organizations
  - A. List and discuss functions
  - B. Discuss relationship with fire department
4. Obligation of Fire Personnel to the Community
  - A. Legal responsibilities
  - B. Provide leadership
  - C. Become involved
  - D. A tool to achieve better public relations
  - E. Provide best possible service to taxpayers
5. Employee Organizations
  - A. Volunteer associations
  - B. Paid associations
  - C. Combination associations

**EVALUATION:**

Through written or oral examination, the student should be able to:

- A. Develop a historical chart
- B. List community service organizations and state the primary function of each
- C. List and discuss the importance of employee organizations

### FFI - 3 FIRE APPARATUS

FFI - 3A	Origin and Development of Fire Apparatus; Fire Apparatus Types: Pumpers, Aerial Ladders, Elevating Platforms, Squads	2 hours
FFI - 3B	Fire Apparatus Types: Tank and/or Rural Apparatus, Brush or Booster Apparatus, Rescue Apparatus, Ambulances, Aircraft Fire Apparatus, Chemical Fire Apparatus, Power and Floodlight Apparatus, Quad or Quint Apparatus, Combination Pumper and Elevating Water Devices, and Fire Boats	2 hours
TOTAL		4 hours

**FFI - 3A "ORIGIN AND DEVELOPMENT OF FIRE APPARATUS:  
FIRE APPARATUS TYPES: PUMPERS, AERIAL  
LADDERS, ELEVATING PLATFORM, SQUADS"**

**TIME:**

2 hours

**OBJECTIVES:**

Develop a basic understanding of the following:

- Fire apparatus history and tradition
- Fire apparatus terminology
- Fire apparatus evolution to present development

Develop a basic understanding of design characteristics, purpose, and function of the following fire apparatus:

- Pumper
- Aerial Ladders
- Elevating Platform
- Squads

**INSTRUCTOR REFERENCES:**

1. IFSTA Instructor's Guide Sheet 106, Lesson 1 and 2
2. IFSTA 106, Pgs. 3-12

**SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:**

NFPA 1901 (Automotive Fire Apparatus)

**INSTRUCTOR MATERIALS:**

1. History of fire service (slide presentation)
2. Visual aids of the following:
  - Various types of pumpers
  - Various types of aerial ladder apparatus
  - Elevating platform apparatus
  - Squad fire apparatus

**DESCRIPTION OF DRILL:**

This drill should emphasize the origin and transition of fire apparatus to present day development; apparatus terminology; design characteristics, purpose and function; and tools and equipment carried on each piece of fire apparatus covered in this drill.

**DRILL SETTING:**

This drill should be held in the classroom. Visual aids should be used to depict each type of apparatus. The instructor should be familiar with NFPA 1901, "Automotive Fire Apparatus."



**FFI - 3A "ORIGIN AND DEVELOPMENT OF FIRE APPARATUS;  
FIRE APPARATUS TYPES: PUMPERS, AERIAL  
LADDERS, ELEVATING PLATFORM, SQUADS"**

**TIME:**

2 hours

**OBJECTIVES:**

To provide the student with a basic understanding of fire service apparatus listed above.

**COVERAGE:**

Fire apparatus history and tradition; fire apparatus terminology; fire apparatus evolution; design characteristics, purpose and function of pumpers; aerial ladders; elevating platforms; and squads.

**MATERIALS:**

1. History of fire service (slide presentation)
2. Visual aids of various types of apparatus
3. Chalkboard, chalk
4. NFPA Pamphlet #1901

**PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 106, Lessons 1 and 2
  - IFSTA 106, Pgs. 3-12
  - NFPA Pamphlet #1901

**INTRODUCTION:**

Read Paragraph 1, Pg. 3, IFSTA 106

**PRESENTATION:**

1. Transition of Fire Apparatus
  - A. Masheens (wooden boxes)
  - B. Hand-operated piston pumps
  - C. Tubs of flexible fire hose

- D. Two-wheeled carts
- E. Four-wheeled ladder wagons
- F. Fire extinguisher wagons
- 2. Present Day Requirements - Review NFPA Pamphlet #1901 covering classifications listed below:
  - A. Pumpers
  - B. Aerial ladder apparatus
  - C. Elevating platform apparatus
  - D. Squad fire apparatus

**EVALUATION:**

Develop and administer a written or oral exam covering the material presented during this session.

FFI - 3B "FIRE APPARATUS TYPES: TANK AND/OR RURAL APPARATUS, BRUSH OR BOOSTER APPARATUS, RESCUE APPARATUS, AMBULANCES, AIRCRAFT FIRE APPARATUS, CHEMICAL FIRE APPARATUS, POWER AND FLOODLIGHT APPARATUS, QUAD OR QUINT APPARATUS, COMBINATION PUMPER AND ELEVATING WATER DEVICES, AND FIRE BOATS"

TIME:

2 hours

OBJECTIVES:

Develop a basic understanding of the design characteristics, purpose and function of the following fire apparatus:

- Tank and/or rural apparatus
- Brush or booster fire apparatus
- Rescue apparatus
- Ambulance
- Aircraft fire apparatus
- Chemical fire apparatus
- Power and floodlight apparatus
- Quad or Quint apparatus
- Combination pumper and elevating water device
- Fire boats

INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 106, Lessons 3 and 4
2. IFSTA 106 Pgs. 12-18
3. IFSTA 206, Pgs. 53-67 (Specialized Fire Fighting and Rescue Apparatus)

SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. NFPA 1901 (Automotive Fire Apparatus)
2. NFPA 403 (Aircraft Rescue and Fire Fighting Services)
3. Fire Protection Handbook - 14th edition, 9-45 (Fire Fighting Apparatus and Equipment)

INSTRUCTOR MATERIALS:

Visual aids of the following:

- Tank and/or rural apparatus
- Brush or booster fire apparatus
- Rescue apparatus

- Ambulance
- Aircraft fire apparatus
- Chemical fire apparatus
- Power and floodlight apparatus
- Quad and quint apparatus
- Combination pumper and elevating water device
- Fireboat

DESCRIPTION OF DRILL:

This drill should emphasize the design characteristics, purpose, function, and tools and equipment carried on each piece of fire apparatus covered in this drill.

DRILL SETTING:

This drill should be held in the classroom. Visual aids should be used to depict each type of apparatus.

**FFI - 3B "FIRE APPARATUS TYPES: TANK AND/OR RURAL APPARATUS, BRUSH OR BOOSTER APPARATUS, RESCUE APPARATUS, AMBULANCES, AIRCRAFT FIRE APPARATUS, CHEMICAL FIRE APPARATUS, POWER AND FLOODLIGHT APPARATUS, QUAD OR QUINT APPARATUS, COMBINATION PUMPER AND ELEVATING WATER DEVICES, AND FIRE BOATS"**

**TIME:**

2 hours

**OBJECTIVES:**

To provide the students with a basic understanding of fire service apparatus listed above.

**COVERAGE:**

Design characteristics, purpose, and function of the following apparatus: tank and/or rural apparatus, brush or booster apparatus, rescue apparatus, ambulance, aircraft apparatus, chemical apparatus, power and floodlight apparatus, quad and quint apparatus, combination pumper and elevating water device, fire boats

**MATERIALS:**

1. Visual aids of the above listed apparatus
2. NFPA Pamphlet #1901

**PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 106, Lessons 3 and 4
  - IFSTA 106, Pgs. 12-18
  - NFPA Pamphlet #1901

**INTRODUCTION:**

Discuss the need to develop various types of apparatus to meet complex needs of the fire service.



**PRESENTATION:**

**Classification of Apparatus by Types - Review NFPA Pamphlet #1901 covering the following apparatus:**

- A. Tank and rural apparatus
- B. Brush or booster apparatus
- C. Rescue apparatus
- D. Ambulances
- E. Aircraft fire apparatus
- F. Chemical fire apparatus
- G. Power and floodlight apparatus
- H. Quad or Quint apparatus
- I. Combination pumper and elevating water devices
- J. Fire boats

**EVALUATION:**

Through written or oral examination, students should know the basic principles of this session.

## **FFI - 4 FIRE BEHAVIOR AND PORTABLE FIRE EXTINGUISHERS**

<b>FFI - 4A Fire Behavior</b>	<b>2 hours</b>
<b>FFI - 4B Portable Extinguishers</b>	<b>2 hours</b>
<b>FFI - 4C Using Portable Fire Extinguishers</b>	<b><u>8 hours</u></b>
<b>TOTAL</b>	<b>12 hours</b>

## FFI - 4A "FIRE BEHAVIOR"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Basic components of burning
- Flame spread
- Flash over
- Phases of fire
- Heat transfer

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 101, Lesson 11
2. IFSTA 101, pages 131-148
3. IFSTA 107, Section 1 (The Burning Process)
4. IFSTA 110, pages 35-40 (How Hazards Cause Fires)
5. IFSTA 402, page 79 (Chemistry of Fire)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Fire Protection Handbook, Section 2
2. NFPA Pamphlet, "Conflagrations in American Since 1900"

### INSTRUCTOR MATERIALS:

Film, "Concepts of Fire Behavior"

### DESCRIPTION OF DRILL:

This drill should emphasize basic fire chemistry, including flammable liquids characteristics, products of combustion, transmission of heat, and phases of fire.

## **FFI - 4A "FIRE BEHAVIOR"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of the behavior of fire.

### **COVERAGE:**

Basic components of burning; flame spread, flash over, phases of burning, classes of fire, heat transfer.

### **MATERIALS:**

1. Film, "Concepts of Fire Behavior"
2. Visual Aids - transparencies
3. Chalkboard, chalk

### **PREPARATION:**

1. Review the following materials as you feel necessary:
  - IFSTA Instructor's Guide Sheet 101, Lesson 11
  - IFSTA 101, pages 131-148
  - IFSTA 107, Section 1
  - IFSTA 110, page 7
  - IFSTA 402, page 79
2. Make ready materials
3. Make ready classroom

### **INTRODUCTION:**

Discuss with your students the need for knowing fire chemistry-scientific aspects of burning, extinguishing processes, requirements for sustained burning, different kinds of fires.

### **PRESENTATION:**

1. Basic Components of Burning
  - A. Fire Triangle

- B. Fire tetrahedron
  - (1) fuel
  - (2) heat (temperature)
  - (3) oxygen (oxidizing agent)
  - (4) chemical chain reaction
- 2. Fire Extinguishing Methods
  - A. Removal of fuel
  - B. Cooling
  - C. Smothering
  - D. Inhibition of chemical chain reaction
- 3. Characteristics of Flammable Liquids
  - A. Flash point
  - B. Burning point
  - C. Ignition temperature and sources
  - D. Spontaneous ignition
  - E. Explosive limits
  - F. Vapor density
- 4. Products of Combustion
  - A. Fire gases
  - B. Flame
  - C. Heat
  - D. Smoke
- 5. The Phases of Confined Fire
  - A. Incipient phase
  - B. Free burning phase
  - C. Smoldering phase
  - D. Back drafts or smoke explosions
- 6. Transmission of Heat
  - A. Law of heat flow
  - B. Conduction
  - C. Radiation
  - D. Convection
  - E. Direct flame contact
  - F. Law of specific heat
  - G. Law of latent heat of vaporization
  - H. Expansion of gases
- 7. Conditions Influencing Fire Spread
  - A. Fuel load
  - B. Climatic conditions
  - C. Building construction
- 8. Characteristics of Conflagration Fires
  - A. Definition of conflagration
  - B. Factors contributing to conflagration fires
  - C. Conflagration patterns in various types of fires

**EVALUATION:**

Develop and administer a written or oral examination covering the materials in this lesson.

**NFPA 1001 STANDARD 3-16.1**

## FFI - 4B "PORTABLE EXTINGUISHERS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Construction of various extinguishers
- Operating principle of various extinguishers
- Maintenance of various extinguishers

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 101, Lesson 12
2. IFSTA 101, Pgs. 148-168
3. IFSTA 107, Pg. 41 (CO<sub>2</sub> Extinguisher Illustration)
4. IFSTA 108, Pg. 48 (Methods of Filling Small Cylinders)
5. NFPA, National Fire Codes, Standard 10

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. NFPA 10-33 (Antifreeze solution - Table C - 1222)
2. Fire Protection Handbook - 14th edition
  - 16-18 (Operation and Use of Fire Extinguishers)
  - 16-20 (Liquified Gas Extinguishers)
  - 16-21 (Dry Chemical Extinguishers)
  - 16-23 (Dry Powder Extinguishers)
  - 16-29 (Hydrostatic Testing)

### MATERIALS, EQUIPMENT:

Example of various types of extinguishers

### DESCRIPTION OF DRILL:

This drill should emphasize the construction of various types of extinguishers; operating principles; and maintenance requirements.

### DRILL SETTING:

This drill should be held in the classroom and department service area to show and discuss various extinguishers and operating principles. The student should have a practice session to demonstrate the maintenance and refilling of various types of extinguishers.

## **FFI - 4B "PORTABLE EXTINGUISHERS"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide students with a basic understanding of the use and maintenance of extinguishers.

### **COVERAGE:**

Construction of various extinguishers; operating principle of various extinguishers; maintenance of various extinguishers.

### **MATERIALS:**

1. Various types of extinguishers
2. Visual aids (if available)

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 101, Lesson 12
  - IFSTA 101, Pgs. 148-168
  - IFSTA 107, Pg. 41 (CO<sub>2</sub> Extinguisher Illustration)
  - IFSTA 108, Pg. 48 (Method of Filling Small Cylinders)
  - NFPA, National Fire Codes, Standard 10
2. Make ready materials
3. Make ready classroom

### **INTRODUCTION:**

Emphasize the use of fire extinguishers for their "intended" use. Also make it clear to your students that most fire extinguishers are first-aid type and should be used on small problems for which they were designed.

### **PRESENTATION:**

Probably the most efficient means by which to cover the various uses and general information about each type of extinguisher is to take them one at a time as illustrated in IFSTA 101 starting on Pg. 148. You may want to read from the text, stopping to discuss each type, and show visual aids if available.



1. Session should include:
  - A. Standard fire pails, drums with pails, bucket, tanks
  - B. Water type extinguishers (pump tank)
  - C. Bromotrifluoromethane extinguishers
  - D. Stored pressure water extinguishers
  - E. Chemical solution (soda-acid) extinguishers
  - F. Cartridge operated water extinguishers
  - G. Carbon dioxide extinguishers
  - H. Foam extinguishers
  - I. Dry chemical extinguishers
2. Show chart on Pg. 166, IFSTA 101
3. Discuss where portable fire extinguishers are required (NFPA Standard 10)

**EVALUATION:**

Prepare and administer a written or oral examination covering the various types of extinguishers. Questions should address:

- A. Sizes and types
- B. Application
- C. Servicing
- D. Methods of operation.

## FFI - 4C "USING PORTABLE FIRE EXTINGUISHERS"

### TIME:

8 hours

### OBJECTIVES:

To develop proficiency and efficient techniques in using extinguishers to extinguish various types of fires.

### INSTRUCTOR REFERENCES:

1. IFSTA 101, Section 3
2. Fire Protection Handbook - 14th edition, Section 18
3. NFPA Standards #10 and 10A

### MATERIALS, EQUIPMENT:

1. Examples of various types of extinguishers
2. Supplies of agent needed to refill extinguishers to be used in drill

### DESCRIPTION OF DRILL:

This drill should emphasize use of the proper type of extinguisher on different classes of fires. Application should stress appropriate techniques and skills as well as knowledge of the kind of extinguisher to be used in various fire situations.

### DRILL SETTING:

This drill should be held over several class periods. A portion of each period should be used for a brief review. Training grounds for various kinds of fires should be used for the major part of each drill, with each student being allowed to become familiar with the use of as many types of portable extinguishers as possible.

## **FFI - 4C "USING PORTABLE FIRE EXTINGUISHERS"**

### **TIME:**

8 hours

### **OBJECTIVES:**

To allow students to practice the skills necessary to efficiently and quickly extinguish a variety of fires with portable extinguishers.

### **COVERAGE:**

Classification of extinguishers according to use; use of extinguishers in a practical situation.

### **MATERIALS:**

1. Various types of extinguishers
2. Equipment and fuel necessary to provide various types of fires, with the capacity to re-ignite each fire frequently
3. Supplies of extinguishing agents and materials necessary to refill various kinds of extinguishers

### **PREPARATION:**

1. Make ready the training grounds by setting the fire scenes
2. Provide apparatus necessary for back-up protection

### **INTRODUCTION:**

Emphasize the need to use appropriate extinguishers for each type of fire. Show what can happen if the wrong kind of extinguisher is used on a certain type of fire.

### **PRESENTATION:**

Have students practice several attacks on several kinds of fire with various extinguishers. Practice conservation of extinguishing agent in each kind of fire attack.

**EVALUATION:**

Observe students as they practice and demonstrate tasks at the drill site.

**TASK PERFORMANCE:**

Tasks No. 1, 2

## **FFI - 5 FORCIBLE ENTRY AND ROPES**

<b>FFI - 5A</b>	<b>Forcible Entry; Building Construction</b>	<b>2 hours</b>
<b>FFI - 5B</b>	<b>Opening Doors</b>	<b>1 hour</b>
<b>FFI - 5C</b>	<b>Opening Windows</b>	<b>1 hour</b>
<b>FFI - 5D</b>	<b>Opening Roofs and Floors</b>	<b>2 hours</b>
<b>FFI - 5E</b>	<b>Opening Walls, Partitions and Ceilings</b>	<b>2 hours</b>
<b>FFI - 5F</b>	<b>Knots, Hitches and Care of Ropes</b>	<b>2 hours</b>
<b>FFI - 5G</b>	<b>Knots, Hitches and Hoisting Practices</b>	<b>2 hours</b>

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**TOTAL 12 hours**

## FFI - 5A "FORCIBLE ENTRY; BUILDING CONSTRUCTION"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Reasons for forcible entry
- General building construction
- Forcible entry tools

Teach the following skills:

- Identification and use of forcible entry tools
- Location of forcible entry tools in fire department

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 101, Lesson 1
2. IFSTA 101, Pgs. 3-14
3. IFSTA 107, Pg. 67 (Forcing Entry Required for Ventilation)
4. IFSTA 107, Pg. 77 (To Perform Rescue Work)
5. IFSTA 107, pg. 73 (To Provide Fire Control)
6. IFSTA 107, Pg. 45 (General Building Construction Features)
7. IFSTA 107, Pg. 99 (Structural Characteristics of the Building)
8. IFSTA 107, Pgs. 90-91 (Utilizing Forcible Entry Tools)
9. IFSTA 110, Pg. 89 (Building Construction Classification)
10. IFSTA 206, Pg. 216 (Forcing Entry into Aircraft)
11. IFSTA 206, Pg. 223 (Power Saw Operation)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

Fire Protection Handbook - 14th Edition, 9-55 (Forcible Entry Tools)

### MATERIALS, EQUIPMENT:

All available forcible entry tools:

1. Pick-headed fire axe
2. Spanner wrench
3. Prying tools
4. Pike pole
5. Power saws
6. Bolt cutters
7. Sledge hammer
8. Wood and metal hand saws
9. Hydraulic power tools

**DESCRIPTION OF DRILL:**

This drill should emphasize the purpose of forcible entry; general aspects of building construction; familiarize the student with names of forcible entry tools; and demonstrate use and where it is normally carried in the department.

**DRILL SETTING:**

This drill should be held at the training ground or a building awaiting demolition. The students should practice the proper technique of opening roofs and floors using a fire axe and a circular or power saw. If a building is not available, scrap pieces of plywood and 2 x 4's could be assembled to simulate a roof or floor. A short classroom session could be held to show and discuss the various roof styles and the opening of roofs and floors.



## **FFI - 5A "FORCIBLE ENTRY; BUILDING CONSTRUCTION"**

### **TIME:**

**2 hours**

### **OBJECTIVES:**

To provide the student with a basic understanding of forcible entry, building construction, and forcible entry tools.

### **COVERAGE:**

Reasons for forcible entry; general building construction; forcible entry tools; identification and use of tools; location of forcible entry tools on apparatus.

### **MATERIALS:**

1. All available forcible entry tools
  - A. Pick-headed fire axe
  - B. Spanner wrench
  - C. Prying tools
  - D. Pike Pole
  - E. Power saws
  - F. Bolt cutters
  - G. Sledge Hammer
  - H. Wood and metal hand saws
  - I. Hydraulic power tools
2. Overhead projector and screen
3. Visual aids illustrating various types of building construction.

### **PREPARATION:**

1. Review the following materials as you feel necessary:
  - IFSTA Instructor's Guide Sheet 101, Lesson 1
  - IFSTA 101, Pgs. 3-14
  - IFSTA 107, Pg. 67 (Forcing Entry Required for Ventilation)
  - IFSTA 107, Pg. 77 (To Perform Rescue Work)
  - IFSTA 107, pg. 73 (To Provide Fire Control)
  - IFSTA 107, Pg. 45 (General Building Construction Features)
  - IFSTA 107, Pg. 99 (Structural Characteristics of the Building)
  - IFSTA 107, Pgs. 90-91 (Utilizing Forcible Entry Tools)
  - IFSTA 110, Pg. 89 (Building Construction Classification)
  - IFSTA 206, Pg. 216 (Forcing Entry into Aircraft)
  - IFSTA 206, Pg. 223 (Power Saw Operation)

2. Make ready materials
3. Make ready classroom

### INTRODUCTION:

Emphasize to the students the necessity of knowing the basics of building construction. Relate also the need to be capable of identifying forcible entry tools and especially why one should know where each tool is located. It may be necessary to cite personal experiences.

### PRESENTATION:

1. Building Construction (IFSTA 101, Pgs. 7-9)
  - A. Present visual aids on building construction
    - (1) Discuss various types of construction
    - (2) Discuss problems encountered
2. Forcible Entry Tools (IFSTA 101, Pgs. 10-14)
  - A. Have students select a forcible entry tool
  - B. Have each student discuss the tool he selected (share each other's knowledge)
  - C. Have students locate forcible entry tools on the apparatus

### EVALUATION:

1. Prepare a brief written or oral exam covering various aspects of building construction
2. Each student should be able to identify, locate and explain the function of each forcible entry tool used in your department.

### TASK PERFORMANCE:

Tasks No. 3, 4

## FFI - 5B "OPENING DOORS"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of the following:

--Proper technique of force opening various types of doors

Teach the following skills:

--Force open door that swings inward

--Force open door that swings outward

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 101, Lessons 2 and 3
2. IFSTA 101, Pgs. 15-41
3. IFSTA 107, Pg. 89 (Door Opening Illustration)

### INSTRUCTOR MATERIALS:

1. Visual aids of various types of doors
2. Structure awaiting demolition
3. Overhead projector and screen

### MATERIALS, EQUIPMENT:

1. Fire axes
2. Prying tools
3. Other forcible entry tools that are available

### DESCRIPTION OF DRILL:

This drill should emphasize the various types of doors and the proper technique of force opening these doors.

### DRILL SETTING:

This drill should be held partially in the classroom showing visual aids and discussing the various doors and techniques in force opening these doors. There should also be a practical session in a structure ready for demolition where the student can practice force opening doors that swing inward and doors that swing outward. If a structure is not available, props may be set up at the training grounds to practice these procedures.

## **FFI - 5B "OPENING DOORS"**

### **TIME:**

1 hour

### **OBJECTIVES:**

To provide a basic understanding and skills necessary to open doors during emergency situations.

### **COVERAGE:**

Techniques in opening various doors; force opening doors that swing inward; force opening doors that swing outward.

### **MATERIALS:**

1. Visual aids of various types of doors
2. Structure awaiting demolition (if available)
3. Fire axes
4. Prying tools
5. Other forcible entry tools
6. Overhead projector and screen

### **PREPARATION:**

1. Review the following materials as you feel necessary:
  - IFSTA Instructor's Guide Sheet 101, Lessons 2 and 3
  - IFSTA 101, Pgs. 15-41
  - IFSTA 107, Pg. 89 (Doors Opening Illustration)
2. Make ready materials
3. Make ready building (if available)
4. Make ready classroom

### **INTRODUCTION:**

Emphasize the idea "try before you pry" to your students, discussing actions that would be appropriate prior to forcibly opening a door. Discuss keeping damage to a minimum by utilizing good forcible entry techniques. Explain the procedures involved in re-locating at the building site if you have made such arrangements.

**PRESENTATION:**

1. Types of Doors (IFSTA 101, Pg. 15)
  - A. Wood swinging doors and jamb construction (IFSTA 101, Pgs. 15-17)
    - (1) Panel
    - (2) Slab
    - (3) Ledge
  - B. Metal swinging doors and jamb construction (IFSTA 101, Pgs. 17-19)
    - (1) Hollow metal
    - (2) Metal covered
    - (3) Tubular
  - C. Swinging door locks and fasteners - Discuss various locks and fasteners.
2. Techniques of Forcing Swinging Doors
  - A. Check door with hand for heat
  - B. Break glass if necessary
  - C. Break lock if necessary (IFSTA 101, Pgs. 23-24)
  - D. Forcing doors that open toward you (IFSTA 101, Pgs. 24-25)
  - E. Forcing doors that open away from you (IFSTA 101, Pgs. 26-27)
3. Tempered Plate Glass (IFSTA 101, Pgs. 29-31)
  - A. Discuss construction
  - B. Discuss opening techniques
4. Sliding Doors (IFSTA 101, Pg. 33)
  - A. Discuss construction
  - B. Discuss opening techniques
5. Overhead Doors (IFSTA 101, Pgs. 34-35)
  - A. Discuss construction
  - B. Discuss opening techniques
6. Fire Doors (IFSTA 101, Pgs. 36-39)
  - A. Discuss construction
  - B. Discuss opening techniques
7. Have students work on props

**EVALUATION:**

Have students demonstrate their ability to force open various doors by utilizing available props or doors.

**TASK PERFORMANCE:**

Task No. 5

## FFI - 5C "OPENING WINDOWS"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of the following:

- Proper technique of force opening various types of windows
- Proper technique of breaking windows or glass doors

Teach the following skills:

- Opening locked windows
- Breaking windows or glass doors

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 101, Lesson 4
2. IFSTA 101, Pgs. 42-51
3. IFSTA 107, Pg. 47 (Breaking Windows)
4. IFSTA 107, Pg. 104 (Types of Windows Illustration)
5. IFSTA 107, Pg. 105 (Breaking Glass Illustration)

### INSTRUCTOR MATERIALS:

1. Visual aids of various types of windows
2. Structure awaiting demolition

### MATERIALS, EQUIPMENT:

1. Fire axes
2. Prying tools
3. Pike pole
4. Other forcible entry tools that are available

### DESCRIPTION OF DRILL:

This drill should emphasize the various types of windows; proper technique of force opening these windows; and proper technique of breaking windows or glass doors.

DRILL SETTING:

This drill should be held partially in the classroom showing visual aids and discussing the various windows and proper technique in force opening these windows. There should also be a practical session in a structure ready for demolition where the students can practice force opening windows and practice breaking windows safely.



## **FFI - 5C "OPENING WINDOWS"**

### **TIME:**

1 hour

### **OBJECTIVES:**

To provide the student with a basic understanding and skills necessary to force or break windows.

### **COVERAGE:**

Opening locked windows; breaking locked windows; types and construction of windows.

### **MATERIALS:**

1. Fire axes
2. Prying tools
3. Pike pole
4. Other forcible entry tools
5. Windows (used for demonstration and practice)

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 101, Lesson 4
  - IFSTA 101, Pgs. 41-51
  - IFSTA 107, Pg. 47 (Breaking Windows)
  - IFSTA 107, Pg. 104 (Types of Windows)
  - IFSTA 107, Pg. 105 (Breaking Glass)
2. Make ready materials
3. Make ready classroom
4. Make ready window props

### **INTRODUCTION:**

Emphasize to your students the importance of proper technique in forcing or breaking windows. Discuss damage, public relations, and personal injuries as they relate to forcing or breaking windows.

**PRESENTATION:**

*Discuss briefly the techniques involved in working with the types of windows listed below. Majority of the time, however, should be utilized in practicing the procedures involved in forcing or breaking the various windows. The methods are illustrated on the pages indicated.*

1. Checkrail Window (IFSTA 101, Pgs. 42-43)
  - A. Discuss construction
  - B. Discuss forcing technique
2. Casement Window (IFSTA 101, Pg. 44)
  - A. Discuss construction
  - B. Discuss forcing technique
3. Projected Window (IFSTA 101, Pgs. 44-45)
  - A. Discuss construction
  - B. Discuss forcing technique
4. Awning or Jalousie Window (IFSTA 101, Pgs. 45-46)
  - A. Discuss construction
  - B. Discuss forcing technique
5. Screened or Barred Windows (IFSTA 101, Pgs. 47-48)
  - A. Discuss construction
  - B. Discuss forcing technique
6. Combination Storm Windows (IFSTA 101, Pgs. 48-49)
  - A. Discuss construction
  - B. Discuss forcing technique
7. Breaking Windows (IFSTA 107, Pg. 105)
  - A. Discuss technique in breaking windows
    - (1) Break out entire window
    - (2) Use flat side of axe blade
    - (3) Stand to side of window
    - (4) Angle handle down slightly
    - (5) Clean sash completely
8. Have students perform all tasks discussed-(move to practice area)

**EVALUATION:**

Observe students while they demonstrate their ability to perform the tasks included in this session.

**TASK PERFORMANCE:**

Tasks No. 6, 7

## FFI - 5D "OPENING ROOFS AND FLOORS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Common styles of roofs
- Proper technique in opening roofs and floors

Teach the following skills:

- Use of power tools in opening roofs and floors
- Use of manual tools in opening roofs and floors

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 101, Lessons 6 and 7
2. IFSTA 101, Pgs. 52-67
3. IFSTA 102, Pg. 75 (Placing Roof Ladder on Roof)
4. IFSTA 107, Pg. 48 (Major Roof Styles)
5. IFSTA 107, Pg. 73 (Forcing Entry to Provide Fire Control)
6. IFSTA 107, Pgs. 93-94 (Opening Pitched Roof)
7. IFSTA 107, Pg. 49 (The Flat Roof)
8. IFSTA 107, Pg. 50 (The Pitched Roof)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES

1. NFPA 203-M (Roof Coverings)
2. NFPA 204 (Smoke and Heat Venting)

### INSTRUCTOR MATERIALS:

1. Visual aids of roof types, styles and construction features
2. Structure awaiting demolition

### MATERIALS, EQUIPMENT:

1. Power tools (circular or power saw)
2. Fire axe
3. Pike pole

**DESCRIPTION OF DRILL:**

This drill should emphasize the different roof styles and the proper technique of opening roofs and floors with use of both power and manual tools.

**DRILL SETTING:**

This drill should be held in the classroom or in the engine room.

## **FFI - 5D "OPENING ROOFS AND FLOORS"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of roofs and floors and skills necessary to perform related tasks.

### **COVERAGE:**

Styles of roofs; roof construction; floor construction; techniques involved in opening roofs and floors.

### **MATERIALS:**

1. Visual aids showing:
  - A. Roof types
  - B. Roof styles
  - C. Construction features
2. Structure of props
3. Power tools utilized in your department
4. Fire axe
5. Pike pole

### **PREPARATION:**

1. Review the following materials as you feel necessary:
  - IFSTA Instructor's Guide Sheet 101, Lessons 6 and 7
  - IFSTA 101, Pgs. 52-67
  - IFSTA 102, Pg. 75 (Placing Roof Ladder on Roof)
  - IFSTA 107, Pg. 48 (Major Roof Styles)
  - IFSTA 107, Pgs. 93-94 (Opening Pitched Roof).
  - IFSTA 107, Pg. 49 (The Flat Roof)
  - IFSTA 107, Pg. 50 (The Pitched Roof)
  - IFSTA 107, Pg. 73 (Forcing Entry to Provide Fire Control)
2. Make ready materials
3. Make ready classroom
4. Make ready props or drill facility

## INTRODUCTION:

Although there are only three major types of roofs, one should be capable of recognizing the combinations of the three which make up nine styles used commonly in construction (IFSTA 101, Pg. 52). Discuss experiences encountered while dealing with the different types of roofs.

## PRESENTATION:

*Cover the types of roofs and construction in the classroom through discussion and illustration, then move to your building or props to practice various tasks.*

1. Types of Roofs
  - A. Flat roof (IFSTA 101, Pgs. 53-56)
    - (1) Discuss construction
    - (2) Discuss opening techniques
  - B. Pitched roofs (IFSTA 101, Pgs. 56-59)
    - (1) Discuss construction
    - (2) Discuss opening techniques
  - C. Arched roofs (IFSTA 101, Pgs. 60-61)
    - (1) Discuss construction
    - (2) Discuss opening techniques
  - D. Pre-cast and concrete construction
    - (1) Discuss construction
    - (2) Discuss opening techniques
  - E. Metal Roofs
    - (1) Discuss construction
    - (2) Discuss opening techniques
2. Opening Floors (IFSTA 101, Pgs. 64-67)
  - A. Wood Floors
    - (1) Discuss construction
    - (2) Discuss opening techniques
  - B. Concrete floors
    - (1) Discuss construction
    - (2) Discuss opening techniques
3. Have students go to practice site and practice techniques in teams of two.
  - A. Approach
  - B. Laddering
  - C. Gaining access
  - D. Observe safety principles

## EVALUATION:

Observe students as they practice and demonstrate tasks at the drill site.

## TASK PERFORMANCE:

Tasks No. 3, 8, 9

## FFI - 5E "OPENING WALLS, PARTITIONS, AND CEILINGS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Proper technique in opening walls
- Proper technique in opening partitions
- Proper technique in opening ceilings

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 101, Lesson 5
2. IFSTA 101, Pgs. 68-85
3. IFSTA 107, Pg. 32 (Back Draft Considerations, Wind Direction)
4. IFSTA 107, Pg. 41 (Dangerous Gases)
5. IFSTA 108, Pg. 4 (Personal Protection)

### MATERIALS, EQUIPMENT:

1. Fire axe
2. Pike pole
3. Power tools (circular or chain saw)

### INSTRUCTOR MATERIALS:

Structure awaiting demolition.

### DESCRIPTION OF DRILL:

This drill should emphasize the proper tools, equipment, technique, and procedures used in opening walls, partitions, and ceilings.

### DRILL SETTING:

This drill should be held at a building that is awaiting demolition. If none is available, props made of various materials can be set up at the training grounds for student practice.



## **FFI - 5E "OPENING WALLS, PARTITIONS, AND CEILINGS"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of opening walls, partitions, and ceilings.

### **COVERAGE:**

Opening techniques for masonry and veneered walls; opening techniques for metal walls; opening techniques for wooden frame walls; opening techniques for partitions.

### **MATERIALS:**

1. Fire axe
2. Pike pole
3. Power tools
4. Chalkboard, chalk
5. Structure (if available)

### **PREPARATION:**

1. Review the following materials as you feel necessary:
  - IFSTA Instructor's Guide Sheet 101, Lesson 5
  - IFSTA 101, Pgs. 68-85
2. Make ready materials
3. Make ready building or props

### **INTRODUCTION:**

Read IFSTA 101, Paragraph 1, Pg. 68. Emphasize the importance of proper opening of walls, ceilings, and partitions to minimize damage.

### **PRESENTATION:**

1. Masonry and Veneered Walls (IFSTA 101, Pgs. 68-70)
  - A. Discuss construction
  - B. Discuss key points in opening

2. Metal Walls (IFSTA 101, Pgs. 70-71)
  - A. Discuss construction
  - B. Discuss key points in opening
3. Wooden Frame Walls (IFSTA 101, Pgs. 71-72)
  - A. Discuss construction
  - B. Discuss key points in opening
4. Partitions (IFSTA 101, Pgs. 72-73)
  - A. Discuss construction
  - B. Discuss key points in opening
5. Ceilings (IFSTA 101, Pgs. 74-75)
  - A. Discuss construction
  - B. Discuss key points in opening
6. Proceed to Props or Building
  - A. Demonstrate tasks
  - B. Have students perform the tasks

EVALUATION:

Observation of students while they perform the tasks.

TASK PERFORMANCE:

Tasks No. 3, 8

## FFI 5F. "KNOTS, HITCHES, AND CARE OF ROPES"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Characteristics and use of ropes
- Knots and hitches
- Caring for fire service ropes

Teach the following skills:

Principles of tying the following knots:

- Timber hitch
- Becket bend or sheet bend
- Bowline
- Clove hitch
- Half sheep shank
- Chimney hitch
- Tightening rope between objects
- Hoisting tools and equipment
- Crowning rope end
- Whipping rope end
- Splicing two rope ends
- Eye splice

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 101, Lessons 8, 9, and 10
2. IFSTA 101, Pgs. 89-128
3. IFSTA 102, Pg. 123 (Hoisting Ladders)
4. IFSTA 103, Pg. 55 (Rope, Strap, and Chain Hose Tools)
5. IFSTA 103, Pg. 253 (Hoisting Hose)
6. IFSTA 108, Pg. 92 (Rappelling; Sliding Down Life Line)
7. IFSTA 108, Pg. 90 (Life Line Practices)
8. IFSTA 108, Pg. 65 (Bowline-On-A-Bight)
9. IFSTA 108, Pg. 70 (Double Bowline)
10. IFSTA 108, Pg. 73 (Butterfly Knot)
11. IFSTA 108, Pgs. 77-96 (Lowering Victims With Rope)

### INSTRUCTOR MATERIALS:

1. 10-foot rope for each student
2. Visual aids

**MATERIALS, EQUIPMENT:**

1. Prying tool or pike pole
2. Roof ladder
3. Extinguisher
4. 2 1/2 inch hose with nozzle
5. Salvage cover
6. Pick-headed axe

**DESCRIPTION OF DRILL:**

This drill should emphasize the characteristics and uses of ropes utilized in the fire service; demonstration; practicing of all knots used by the department; and the care and maintenance of fire service ropes.

**DRILL SETTING:**

This drill should be held in the classroom or a space large enough to demonstrate and practice the various knots. Each student should practice and become proficient in tying knots.

## FFI - 5F "KNOTS, HITCHES, AND CARE OF ROPES"

### TIME:

2 hours.

### OBJECTIVES:

To provide the student with a basic understanding of knots, hitches, and care of ropes, and related skills.

### COVERAGE:

Characteristics and use of ropes; knots and hitches; caring for fire service ropes; principles of tying ropes used in the fire service.

### MATERIALS:

1. 10-foot piece of rope for each student
2. Visual aids (if available)

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 101, Lessons 8, 9, and 10
  - IFSTA 101, Pgs. 89-128
2. Make ready materials
3. Make ready classroom

### INTRODUCTION:

Emphasize to your students the importance of ropes and knots in the fire service. Discuss various situations where the knowledge and use of proper knots would be critical.

### PRESENTATION:

1. Rope's Strength
  - A. Dependent on size
  - B. Dependent on fiber
2. A Good Knot
  - A. Is easily tied
  - B. Is easily untied
  - C. Accomplishes its intended purpose

3. Principles of Tying Knots (IFSTA 101, Pgs. 100-101)
  - A. Bight
  - B. Loop
  - C. Round turn
  - D. Standing part
  - E. Running part
4. Tying Fire Service Knots (Utilize diagrams IFSTA 101, Pgs. 100-124)
  - A. Demonstrate the following tasks
    - (1) Timber hitch
    - (2) Becket bend or sheet bend
    - (3) Bowline
    - (4) Clove hitch
    - (5) Half sheep shank
    - (6) Chimney Hitch
    - (7) Tightening rope between objects
    - (8) Hoisting tools and equipment
    - (9) Crowning rope end
    - (10) Whipping rope end
    - (11) Splicing two rope ends
    - (12) Eye Splice
  - B. Have students practice the above tasks

**EVALUATION:**

Observation of students during the session.

**TASK PERFORMANCE:**

Task No. 10

## FFI 5G "KNOTS, HITCHES, AND HOISTING PRACTICES"

### TIME:

2 hours

### OBJECTIVES:

Develop proficiency in the following:

- Tying knots and hitches
- Hoisting equipment

### INSTRUCTOR REFERENCES:

1. IFSTA 101, Pgs. 100-118
2. IFSTA 108, Pg. 65 (Bowline-on-a-Bight)
3. IFSTA 108, Pg. 70 (Double Bowline)
4. IFSTA 108, Pg. 73 (Butterfly Knot)
5. IFSTA 103, Pg. 253 (Hoisting Hose)
6. IFSTA 102, Pg. 123 (Hoisting Ladders)

### MATERIALS, EQUIPMENT:

1. Prying tool or pike pole
2. Roof ladder
3. Extinguisher
4. 2 1/2 inch hose with nozzle
5. Salvage cover
6. Pick-headed axe

### DESCRIPTION OF DRILL:

This drill should emphasize the proper tying of knots and hitches used by the department and the correct knot for hoisting equipment.

### DRILL SETTING:

This drill should be held at the training tower or any suitable location where equipment can be hoisted 20-40 feet. Each student should demonstrate the ability to select the proper knot or hitch, and hoist the equipment.

## **FFI - 5G "KNOTS, HITCHES, AND HOISTING PRACTICES**

### **TIME:**

2 hours

### **OBJECTIVES:**

To develop proficiency in tying knots learned the previous session and provide students with the knowledge and skills necessary to hoist equipment.

### **COVERAGE:**

Tying fire service knots and hoisting fire service equipment utilizing knots and hitches.

### **MATERIALS:**

1. Forcible entry tools utilized in your department
2. Various ropes utilized in your department

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA 101, Pgs. 100-118
  - IFSTA 108, Pg. 65 (Bowline-on-a-Bight)
  - IFSTA 108, Pg. 70 (Double Bowline)
  - IFSTA 108, Pg. 73 (Butterfly Knot)
  - IFSTA 103, Pg. 253 (Hoisting Hose)
  - IFSTA 102, Pg. 123 (Hoisting Ladders)
2. Make ready materials
3. Arrange for facility where equipment can be raised.

### **INTRODUCTION:**

Emphasize to your students that this session is designed to prepare them to utilize ropes and knots at the fire scene.



**PRESENTATION:**

1. Tying Fire Service Knots (IFSTA 101, Pgs. 100-118)
  - A. Review knots covered during last session
  - B. Demonstrate the following knots
    - (1) Bowline-on-a-Bight (IFSTA 108, Pg. 65)
    - (2) Double bowline (IFSTA 108, Pg. 70)
    - (3) Butterfly knot (IFSTA 108, Pg. 73)
  - C. Have students perform the above tasks
2. Hoisting Hose (IFSTA 103, Pg. 253)
  - A. Demonstrate task
  - B. Have students perform the task
3. Hoisting Ladders (IFSTA 102, Pg. 123)
  - A. Demonstrate task
  - B. Have students perform the task
4. Hoisting Equipment
  - A. Demonstrate task
  - B. Have students perform the task

**EVALUATION:**

1. Observation of students during session
2. Have each student demonstrate his ability to perform all tasks covered.

**TASK PERFORMANCE:**

Tasks No. 10, 11, 12

## FFI - 6 LADDERS

FFI - 6A	Introduction to Fire Service Ladders	1 hour
FFI - 6B	Selecting, Removing, Mounting, Raising, Spacing and Climbing Ladders	1 hour
FFI - 6C	Carrying and Raising Wall Ladders	1 hour
FFI - 6D	Roof Ladder Carry and Raise; Assisting Victims Down Ladders	2 hours
FFI - 6E	Carrying and Raising Extension Ladders 35 Feet and Under	2 hours
FFI - 6F	Carrying and Raising Extension Ladders with Tormentors	1 hour
FFI - 6G	Working from Raised Extension Ladders	2 hours
FFI - 6H	Special Ladder Carries, Raises, and Uses	1 hour
FFI - 6I	Preparing Aerial Ladder for Operation	1 hour
		<hr/>
		TOTAL 12 hours

## FFI - 6A "INTRODUCTION TO FIRE SERVICE LADDERS"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding and ability to identify the following:

- Types of fire service ladders
- Functions of fire service ladders
- Fire service ladders terms and definitions
- Design and construction of fire service ladders
- Care and maintenance of fire service ladders
- Materials used in ladder construction

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 102, Lessons 1, 2, 3, and 5
2. IFSTA 102, Pg. 1-18, 38-44
3. IFSTA 104, Pg. 69 (Forming Chutes for Salvage)
4. IFSTA 105, Pg. 155 (Applying Master Fog Stream from Aerial Pipe)
5. IFSTA 107, Pgs. 91-93 (Use in Opening Roof)
6. IFSTA 107, Pg. 105 (Breaking Window from Ladder)
7. IFSTA 107, Pgs. 116-119 (Mounting Smoke Ejectors)
8. IFSTA 108, Pgs. 78-86 (Lowering Victims)
9. IFSTA 108, Pg. 89 (Ladder used as Gin Pole)
10. IFSTA 108, Pg. 95 (Carrying Victim down Ladder)
11. IFSTA 108, Pg. 106 (Float Drag for Rescue)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. NFPA 1901, (Automotive Fire Apparatus)
2. NFPA 1931, Article 100 (Aluminum Ground Ladders for Fire Service)
3. NFPA 1931, Article 110 (Care of Ground Ladders)
4. NFPA 1931, Article 121 (Wooden Fire Ladders)
5. NFPA 1931, Article 122 (Aluminum Fire Ladders)
6. NFPA 1931, Article 130 (Testing Ground Ladders)
7. NFPA 1931, Article 133 (Visual Inspection of Ladders)
8. NFPA 1931, Article 134 (Equipment for Recovery Test)
9. NFPA 1931, Article 137 (Testing Procedures)
10. NFPA 1931, Article 138 (Testing Procedures for Strengths of Individual Rungs)

MATERIALS, EQUIPMENT:

1. Wooden ground ladder
2. Aluminum ground ladder
3. Wall ladder
4. Extension ladder
5. Extension ladder with poles
6. Combination ladder - "A" frame
7. Roof ladder
8. Attic Ladder
9. Aerial ladder
10. Elevating platform

INSTRUCTOR MATERIALS:

1. Visual aids of assorted ladders
2. Chalkboard, chalk

DESCRIPTION OF DRILL:

This drill should emphasize the correct names in identifying ladders used in the fire service; the correct terminology identifying the different components of these ladders; familiarize students with the different functions each ladder is capable of performing; the materials used in ladder construction; advantages and disadvantages of each material; proper inspection procedures including testing, preventive care, and maintenance.

DRILL SETTING:

This drill would normally be in a classroom setting with appropriate visual aids (slides or overheads) to depict equipment. If the necessary equipment is available, the drill could be conducted in the engine room or at the training ground.

## FFI 6A "INTRODUCTION TO FIRE SERVICE LADDERS"

### TIME:

1 hour

### OBJECTIVES:

To familiarize the student with fire service ladders, providing him with a basic understanding of the types, functions and uses of ladders, using proper terms and definitions as related to ladder operations; basic understanding of ladder design and construction, proper inspection and maintenance procedures.

### COVERAGE:

History and development of ladders; types of fire service ladders; functions, terms and definitions as related to fire service ladders; materials used in ladder construction, proper inspection procedures including testing, preventive care, and maintenance.

### MATERIALS:

1. A sample of each type of ladder contained within your department, including both wood and aluminum
2. Visual aids of various ladders
3. Chalkboard, chalk

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 102, Lessons 1, 2, 3, and 5
  - IFSTA 102, Pgs. 1-18, 38-44
  - IFSTA 104, Pg. 69 (Forming Chutes)
  - IFSTA 105, Pg. 98 (Applying Master Fog Stream from Aerial Pipe)
  - IFSTA 107, Pgs. 93, 105, 116-119 (Use in Opening Roofs; Breaking Windows from a Ladder; Mounting Smoke Ejectors on Ladders)
  - IFSTA 108, Pgs. 79-86, 95, 106 (Lowering Victims; Ladder Used as a Gin Pole; Carrying Victims Down Ladders; Float Drag for Rescue)
2. Develop a diagram of an extension ladder and make copies for your students, showing all the parts of a ladder. (Drawing shown on page 10 of IFSTA 102, illustrate on blackboard if needed.)
3. Prepare various locations within your facility whereby several tasks within the lesson can be taught simultaneously, dependent upon instructor availability.
4. Make ladders ready, if available.

**INTRODUCTION:**

Discuss with your students the important role ladders have played throughout history and have students present their ideas as to how ladders can be used in the fire service during day-to-day activities. Emphasize the wide range of uses we get out of fire service ladders and the need for all members to be knowledgeable and highly skilled when performing through the use of ladders. Also emphasize the cost of fire service ladders and the need for proper care and maintenance to insure long life and dependability during day-to-day operations.

**PRESENTATION:**

1. Distribute and discuss the diagram showing the parts, function, and location of each labeled part of the ladder shown.
2. Types of Materials Used in Ladder Construction:
  - A. Wood
  - B. Metal
  - C. Reasons for transition from wood to metal:
    - (1) Weight
    - (2) Durability
    - (3) Stress resistance
    - (4) Visual inspection of all parts
    - (5) Less maintenance than wood
    - (6) Splinter-free surface
    - (7) Not subject to water absorption or dry rot
  - D. Disadvantages of metal ladders:
    - (1) Good conductor of electricity
    - (2) Temperature conductive properties
  - E. Most common metal used is "aluminum alloy"
  - F. Construction of metal ladders
    - (1) Welded or riveted
    - (2) T-shaped or tubular rails
  - G. Truss construction in ladders
    - (1) Aerial ladders
    - (2) Ground ladders (both wood and metal)
3. Inspecting Ladders
  - A. Purpose - to insure long life and dependability during day-to-day operations
  - B. Mark all defects with chalk
  - C. Frequency
    - (1) Once a year
    - (2) During apparatus check
    - (3) After each use
  - D. Discrepancies to inspect for:
    - (1) Cracked trusses or beams
    - (2) Marred rungs
    - (3) Worn or splintered tormentor poles
    - (4) Loose rungs, bolts, rivets
    - (5) Worn halyard
    - (6) Compression failure

- E. Tests (demonstrate to students)
  - (1) Twist test for rungs (IFSTA 102, Pg. 40) - try and twist each rung by hand. If rung twists, set up twist test:
    - (a) Pail of sand (25 lbs.)
    - (b) Clamp
- F. Repairing ladders
  - (1) Minor repairs (demonstrate to students)
    - (a) Tightening bolts
    - (b) Removing splinters (wood ladders)
    - (c) Sanding, varnishing (wood ladders)
  - (2) Major repairs - consult manufacturer
- 4. Introduce each ladder used in your department, explaining the significant factors and uses of each. *When working with ladders during this and future lessons, emphasis should be on SAFETY AND FLUID MOTION.*
- 5. Discuss the following uses for ladders:
  - A. Form chutes for salvage
  - B. Use ladders in opening roofs
  - C. Break windows from a ladder
  - D. Mount smoke ejector(s) on a ladder
  - E. Lower a victim
  - F. Use a ladder as a gin pole
  - G. Carry a victim down a ladder
  - H. Float drag for rescue
  - I. Apply master fog stream from aerial pipe

**EVALUATION:**

- 1. Observation by instructor during the session
- 2. Each student should be able to list types of ladders used in his department, the functions of each, and use proper terminology when discussing or referring to various parts of a ladder.
- 3. Each student should be able to, through written or oral examination:
  - A. List advantages of aluminum ladders
  - B. List disadvantages of aluminum ladders
- 4. Through manipulative demonstration, the student should be able to:
  - A. Inspect ladders
  - B. Test Ladders
  - C. Maintain and make minor repairs of ladders

**TASK PERFORMANCE:**

Task No. 13

**FFI - 6B "SELECTING, REMOVING, MOUNTING, RAISING,  
SPACING, AND CLIMBING LADDERS"**

**TIME:**

1 hour

**OBJECTIVES:**

Develop a basic understanding of the following:

- Selecting appropriate ladders
- Removing ladders from apparatus
- Mounting ladders on apparatus
- Raising ladders
- Spacing and securing ladders
- Climbing ladders

Teach the following skills:

- Properly removing ladders from apparatus
- Properly mounting ladders on apparatus
- Properly raising and lowering ladders
- Properly spacing and securing ladders
- Properly climbing ladders

**INSTRUCTOR REFERENCES:**

1. IFSTA Instructor's Guide Sheet 102, Lesson 4
2. IFSTA 102, Pgs. 25-37
3. IFSTA 103, Pg. 250 (Advancing Hose Up a Ladder)
4. IFSTA 103, Pg. 252 (Passing Hose Up a Ladder)

**MATERIALS, EQUIPMENT:**

1. Pumper with extension ladder or wall ladder
2. Various small equipment off pumper

**DESCRIPTION OF DRILL:**

This drill should emphasize the proper method for selecting ground ladders at the fire ground; removing ground ladders from apparatus; mounting ground ladders on apparatus; raising ground ladders; and spacing, securing, and climbing ground ladders.



DRILL SETTING:

This drill should be held at the training ground or any appropriate location with adequate space for raising ladders. A pumper should be available so that hose and small equipment can be utilized for instruction on the proper carrying of hose and small equipment while ascending and descending ladders.

**FFI - 6B "SELECTING, REMOVING, MOUNTING, RAISING,  
SPACING, AND CLIMBING LADDERS"**

**TIME:**

1 hour

**OBJECTIVES:**

To provide the student with a basic understanding and workable knowledge of the skills necessary to select the appropriate ladder necessary to do the task assigned, remove ladders from apparatus, mount ladders on apparatus, raise and lower ladders as directed, space and secure ladders, and climb ladders in a safe and reliable manner.

**COVERAGE:**

Selecting ladders; removing and mounting ladders; raising and lowering ladders; spacing, securing, and climbing fire service ladders.

**MATERIALS:**

1. Pumper with extend on or wall ladder
2. Various small equipment off pumper
3. Full set of protective clothing for participating members

**PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 102, Lesson 4
  - IFSTA 102, Pgs. 25-37
  - IFSTA 103, Pg. 250 (Advancing Hose Up a Ladder)
  - IFSTA 103, Pg. 252 (Passing Hose Up a Ladder)
2. Make ready an area suitable for advancing and raising ladders

**INTRODUCTION:**

Stress to your students the importance of proper ladder practices, citing experiences or possible situations where ladder operations proved most helpful or advantageous. **RE-EMPHASIZE THE IMPORTANCE OF SAFETY WHENEVER WORKING WITH LADDERS.**

## Presentation:

1. Reasons for Laddering a Building (review):
  - A. Rescue
  - B. Hose line operations
  - C. Ventilation
2. Mounting Ground Ladders on Apparatus
  - A. Direct students to apparatus, pointing out mounting brackets and explaining the reasoning behind mounting ladders in that manner.
3. Removing Ladders from Apparatus (Divide students into groups of two)
  - A. Remove ladder from apparatus and prepare to advance ladder (one and two-man)
  - B. Remove ladder from apparatus and set it aside (one and two-man)
  - C. Mount ladders on apparatus and secure (one and two-man)
4. Raising and Lowering Ladders
  - A. Discuss possible hazards when raising and lowering ladders
5. Spacing and Securing Ladder (demonstrate)
  - A. 75° angle from building
  - B. Arm's length away from rung when standing at heel of ladder
  - C. One-fourth the length of ladder
  - D. Have students perform task
6. Anchoring Ladder (IFSTA 102, Pg. 33)
  - A. In front of ladder (demonstrate)
  - B. Behind ladder (demonstrate)
  - C. Have students perform both tasks
7. Climbing a Ladder (demonstrate)
  - A. Before climbing you should:
    - (1) Examine heels
    - (2) Observe tips to make sure they are secure
    - (3) Check locks
    - (4) Check tormentor poles
  - B. While climbing, with or without tools, you should:
    - (1) Keep eyes straight ahead
    - (2) Keep arms straight
    - (3) Grasp rungs hand over hand
    - (4) Periodically check tips of ladder
  - C. Have students perform the task
8. Leg-Lock or "Locking-In"
  - A. Demonstrate to students
  - B. Have students perform the task.

## Evaluation:

1. Observation by instructor during the session
2. Each student should demonstrate his ability to perform the tasks covered in this session.

TASK PERFORMANCE:

Tasks No. 14, 15

## FFI - 6C "CARRYING AND RAISING WALL LADDERS"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of the following:

- Carrying a pumper extension ladder or wall ladder
- Raising a pumper extension ladder or wall ladder

Teach the following skills:

- One-man ladder carry
- One-man ladder raise
- Two-man shoulder carry
- Two-man hip carry
- Two-man arm's length carry
- Two-man beam raise
- Two-man flat raise

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 102, Lessons 6 and 7
2. IFSTA 102, Pgs. 47-71, 77-90

### MATERIALS, EQUIPMENT:

Pumper with wall ladder

### DESCRIPTION OF DRILL:

This drill should emphasize the proper techniques of carrying pumper extension or wall ladders (hip, shoulder, and arm's length), and the proper techniques of raising pumper wall ladders (flat and beam)

### DRILL SETTING:

This drill should be held at the training ground or any appropriate location with adequate space where ladders can be raised. To fulfill the two-man objectives of this drill, the class should be divided into two-man teams. Carries and raises should be done until a level of proficiency is obtained. All errors should be corrected at the time they occur.

## FFI - 6C "CARRYING AND RAISING WALL LADDERS"

### TIME:

1 hour

### OBJECTIVES:

To provide the student with the information and instruction necessary to properly carry and raise extension or wall ladders.

### COVERAGE:

One and two-man ladder carries (as illustrated in IFSTA 102); one and two-man ladder raises (as illustrated in IFSTA 102).

### MATERIALS:

1. Wall ladders used by the department
2. Facility suitable to carry and raise ladders
3. Full set of protective clothing for each participating student

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 102, Lessons 6 and 7
  - IFSTA 102, Pgs. 47-71, 77-90
2. Make ready an area suitable for carrying and raising ladders

### INTRODUCTION:

Discuss with your students the importance of ladder operations and the need to work well as a team, utilizing proper ladder practices. Have your students list and suggest various situations where wall ladders should or could be used. Stress teamwork and safety.

### PRESENTATION:

1. Discuss the various lengths and construction of straight ladders
2. Carrying straight Ladder (one-man) (IFSTA 102, Pg. 49)
  - A. Demonstrate
  - B. Have students perform the tasks

3. Raising Straight Ladder (one-man) (IFSTA 102, Pg. 50)
  - A. Demonstrate
  - B. Have students perform the tasks
4. Carrying Straight Ladder (two-man) (IFSTA 102, Pg. 53)
  - A. Demonstrate
    - (1) Shoulder carry
    - (2) Hip carry
    - (3) Arm's-length carry
  - B. Have students perform each task
5. Raising Straight Ladder Flat (two-man) (IFSTA 102, Pg. 56)
  - A. Demonstrate
  - B. Have students perform the task
6. Raising Straight Ladder on the Beam (two-man) (IFSTA 102, Pg. 59)
  - A. Demonstrate
  - B. Have students perform the task
7. Carrying Short Extension Ladder (one-man) (IFSTA 102, Pg. 79)
  - A. Demonstrate
    - (1) Low-shoulder method
    - (2) High-shoulder method
  - B. Have students perform each task
8. Raising Short Extension Ladder (one-man) (IFSTA 102, Pg. 81)
  - A. Demonstrate
    - (1) From-the-ground method
    - (2) From-the-shoulder method
    - (3) From-high-shoulder method

EVALUATION:

1. Observation by instructor during the session
2. Each student should demonstrate his ability to perform the task covered in this session
3. Follow up with other sessions to allow students to improve in speed and efficiency

TASK PERFORMANCE:

Tasks No. 16, 17, 18

FFI - 6D "ROOF LADDER CARRY AND RAISE; ASSISTING  
VICTIMS DOWN LADDERS"

TIME:

2 hours

OBJECTIVES:

Develop a basic understanding of the following:

- Roof ladder carry and raise
- Assisting victims down ladders

Teach the following skills:

- Removing roof ladder from apparatus
- Carrying a roof ladder
- Placing roof ladder in position
- Working off roof ladder
- Assisting conscious victim down ladder
- Assisting unconscious victim down ladder

INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 102, Lesson 7
2. IFSTA 102, Pgs. 72-77
3. IFSTA 107, Pgs. 91-94 (Opening Roof)
4. IFSTA 108, Pg. 94 (Assisting Victim Down a Ladder)

MATERIALS, EQUIPMENT:

1. Wall ladder, extension or straight
2. Roof ladder

DESCRIPTION OF DRILL:

This drill should emphasize the proper technique of carrying the roof ladder; placing the roof ladder in position on roof; and working off the roof ladder. Also the technique of assisting a conscious and an unconscious victim down a ladder should be emphasized.



DRILL SETTING:

This drill should be held at the training ground or an appropriate location where a roof ladder and extension ladder can be utilized and where assisting a victim down a ladder can be performed safely. The class should be divided into teams, some being victims and others being rescuers. This drill should be used after proficiency has been gained in carrying and raising extension and straight wall ladders (FFI-6C).

**FFI 6D "ROOF LADDER CARRY AND RAISE;  
ASSISTING VICTIMS DOWN LADDERS"**

**TIME:**

2 hours

**OBJECTIVES:**

To provide the student with the information and knowledge necessary to properly carry and raise roof ladders and assist victims down ladders.

**COVERAGE:**

Proper techniques in carrying and raising roof ladders; positioning a roof ladder on a roof; working off a roof ladder; assisting a conscious or unconscious victim down a ladder.

**MATERIALS:**

1. Extension ladder and/or straight ladder
2. Roof ladder
3. Dummy (120-150 lbs.)
4. Full set of protective clothing for participating students

**PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 102, Lesson 7
  - IFSTA 102, Pgs. 72-77
  - IFSTA 107, Pgs. 91-94 (Opening a Roof)
  - IFSTA 108, Pg. 94 (Assisting a Victim Down a Ladder)
2. Make ready an area suitable for utilizing roof ladders
3. Make ready a dummy (can stuff an old pair of cover-alls with sawdust, etc.)

**INTRODUCTION:**

Discuss with your students the importance of operating off roof ladders, in assisting suppression operations by providing ventilation, and possible assistance in a rescue attempt through the utilization of ladders as a secondary means of escape.

**PRESENTATION:**

1. Carrying Roof Ladder (IFSTA 102, Pg. 72)
  - A. Demonstrate
    - (1) Hooks forward and down
    - (2) Balance point
  - B. Have students perform the task
2. Using Roof Ladder with Extension (IFSTA 102, Pg. 73)
  - A. Demonstrate
    - (1) Responsibility of heel man
    - (2) Select location and position
    - (3) Separate the two ladders
    - (4) Raise extension ladder
    - (5) Open hooks and raise roof ladder
    - (6) One-man lock-in at roof's edge
    - (7) Raise roof ladder to roof
    - (8) Place hooks over ridge of roof
  - B. Divide students into groups of two
  - C. Have students perform the task
3. Utilize Roof Ladder to Open Roof (IFSTA 107, Pg. 94)
  - A. Prior to demonstration discuss:
    - (1) Coordination with ground attack
    - (2) Wind direction
    - (3) Note obstructions
    - (4) Secure lifeline on roof for secondary escape
    - (5) Utilize natural openings where possible
    - (6) Exercise care so main structural supports aren't damaged
    - (7) Cut one large hole rather than several small ones
    - (8) Provide protection to operators (back-up line)
    - (9) Guard opening
    - (10) Extend a blunt object through the opening to break out ceiling
  - B. Demonstrate
  - C. Have students perform the task
4. Assisting Victim Down Ladder (IFSTA 108, Pg. 94)
  - A. Demonstrate
  - B. Have students perform the task utilizing first a dummy, then each other

**EVALUATION:**

1. Observation by instructor during the session
2. Each student should demonstrate his ability to perform the tasks covered in this session
3. Students should be able to list precautions and safety procedures when working off a roof ladder
4. Follow up with other sessions to allow students to improve in speed and efficiency

**TASK PERFORMANCE:**

Tasks No. 16, 19

FFI - 6E "CARRYING AND RAISING  
EXTENSION LADDERS 35 FEET AND UNDER"

TIME:

2 hours

OBJECTIVES:

Develop a basic understanding of the following:

- Removing medium length extension ladders from apparatus
- Carrying medium length extension ladders
- Raising medium length extension ladders
- Restoring medium length extension ladders on apparatus

Teach the following skills:

- Three-man removing medium length ladder from apparatus
- Four-man removing medium length ladder from apparatus
- Two-man shoulder carry
- Three-man shoulder carry
- Three-man arm's length carry
- Four-man shoulder carry
- Four-man arm's length carry
- Two-man flat raise
- Three-man flat raise
- Four-man flat raise
- Beam raise

INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 102, Lesson 8
2. IFSTA 102, Pgs. 91-99

MATERIALS, EQUIPMENT:

Apparatus with 35-foot extension ladder without poles

DESCRIPTION OF DRILL:

This drill should emphasize the general characteristics of medium length extension ladders; properly removing ladders from apparatus; carrying medium length extension ladders; and raising these ladders. Proper spacing, securing, and climbing ladders should be re-emphasized.

**DRILL SETTING:**

This drill should be held at the training ground or at an appropriate location where a 35-foot extension ladder can be utilized. The class should be divided into three-man teams and four-man teams and rotated through the different positions until proficiency at each position is gained. Mistakes should be corrected at the time they occur.

**FFI - 6E "CARRYING AND RAISING  
EXTENSION LADDERS 35 FEET AND UNDER"**

**TIME:**

2 hours

**OBJECTIVES:**

To provide the student with the knowledge and skills necessary to properly remove, carry, raise, and restore to service medium-length extension ladders.

**COVERAGE:**

Tasks involving medium-length extension ladders up to 35 feet in length and shall include general characteristics; proper removal; carrying, raising, and climbing medium-length extension ladders.

**MATERIALS:**

1. Apparatus equipped with 35-foot extension ladder (without tormentors)
2. Facility suitable to carry and raise ladders 35-feet in length
3. Full protective clothing for each participating student.

**PREPARATION:**

1. Review the following material as you feel necessary:  
--IFSTA Instructor's Guide Sheet 102, Lesson 8  
--IFSTA 102, Pgs. 91-99
2. Make ready an area suitable for carrying and raising extension ladders

**INTRODUCTION:**

Discuss with your students areas within your city or district where you have buildings or constructed devices where you might utilize medium-length extension ladders. Emphasize the importance of a smooth, fluid operation developed through training exercises such as the one you are about to instruct. Stress teamwork and safety.

**PRESENTATION:**

1. Removing Medium-Length Extension Ladders from Apparatus (three-man) (IFSTA 102, Pg. 91)
  - A. Demonstrate
  - B. Divide students into groups of three
  - C. Have students perform the task
2. Removing Medium-Length Extension Ladders from Apparatus (four-man)
  - A. Demonstrate
  - B. Divide students into groups of four
  - C. Have students perform the task
3. Carrying Medium-Length Extension Ladder (three-man) (IFSTA 102, Pgs. 92-93)
  - A. Demonstrate shoulder carry, arm's-length carry
  - B. Divide students into groups of three
  - C. Have students perform each task
4. Carrying Medium-Length Extension Ladder (four-man)
  - A. Demonstrate shoulder carry, arm's-length carry
  - B. Divide students into groups of four
  - C. Have students perform each task
5. Raising Medium-Length Extension Ladder (three-man) (IFSTA 102, Pgs. 94-98)
  - A. Demonstrate flat and beam raises
  - B. Divide students into groups of three
  - C. Have students perform the tasks
6. Raising Medium-Length Extension Ladder (four-man)
  - A. Demonstrate flat and beam raises
  - B. Divide students into groups of four
  - C. Have students perform the tasks

**EVALUATION:**

1. Observation by instructor during the session
2. Each student should be able to demonstrate his ability to perform the tasks covered in this session now, or during future sessions
3. Follow up with other sessions to allow students to improve in speed and efficiency

**TASK PERFORMANCE:**

Tasks No. 18

## FFI - 6F "CARRYING AND RAISING EXTENSION LADDERS WITH TORMENTORS"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of the following:

- Removing extension ladders with poles from apparatus
- Carrying extension ladders with poles
- Raising extension ladders with poles
- Restoring extension ladders with poles on apparatus

Teach the following skills:

- Five-man removing extension ladders with poles from apparatus
- Six-man removing extension ladders with poles from apparatus
- Five-man shoulder carry
- Six-man shoulder carry
- Five-man arm's length carry
- Six-man arm's length carry
- Five-man flat raise
- Six-man flat raise

### INSTRUCTOR REFERENCE:

1. IFSTA Instructor's Guide Sheet 102, Lesson 9
2. IFSTA 102, Pgs. 99-109

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

NFPA 1931-105 (Requirements for Extension Ladders Over 36 Feet Long)

### DESCRIPTION OF DRILL:

This drill should emphasize the general characteristics of extension ladders with poles; properly removing these ladders from apparatus; carrying extension ladders with poles; and raising these ladders. Proper spacing, securing, and climbing ladders should be re-emphasized.

### DRILL SETTING:

This drill should be held at the training ground or an appropriate location where extension ladders with poles can be utilized. The class should be divided into five-man and six-man teams and rotated through the different positions until proficiency at each position is gained. Mistakes should be corrected at the time they occur.



## **FFI - 6F "CARRYING AND RAISING EXTENSION LADDERS WITH TORMENTORS"**

### **TIME:**

1 hour

### **OBJECTIVES:**

To provide the student with the knowledge and skills necessary to properly remove, carry, raise, and restore to service extension ladders with tormentor poles.

### **COVERAGE:**

Tasks involving extension ladders with tormentor poles and shall include general characteristics; proper removal; carrying, raising, and climbing extension ladders with tormentors.

### **MATERIALS:**

1. Apparatus equipped with an extension ladder with tormentor poles
2. Facility suitable to carry and raise extension ladders with tormentor poles
3. Full protective clothing for each participating student

### **PREPARATION:**

1. Review the following material as you feel necessary:  
--IFSTA Instructor's Guide Sheet 102, Lesson 9  
--IFSTA 102, Pgs. 99-109
2. Make ready an area suitable for carrying and raising extension ladders with tormentor poles

### **INTRODUCTION:**

Discuss with your students areas within your city or district where you have buildings or constructed devices where you might utilize extension ladders with tormentor poles. Emphasize the importance of a smooth, fluid operation developed through training exercises such as the one you are about to instruct. Stress teamwork and safety now, and as you proceed through the lesson.

**PRESENTATION:**

1. Removing Extension Ladder with Tormentor Poles from Apparatus (five-man) (IFSTA 102, Pg. 99)
  - A. Demonstrate
  - B. Divide students into groups of five
  - C. Have students perform the task
2. Removing Extension Ladder with Tormentor Poles from Apparatus (six-man)
  - A. Demonstrate
  - B. Divide students into groups of six
  - C. Have students perform the task
3. Carrying Extension Ladder with Tormentor Poles (five-man) (IFSTA 102, Pgs. 100-101)
  - A. Demonstrate shoulder carry, arm's length-carry
  - B. Divide students into groups of five
  - C. Have students perform each task
4. Carrying Extension Ladder with Tormentor Poles (six-man)
  - A. Demonstrate shoulder carry, arm's-length carry
  - B. Divide students into groups of six
  - C. Have students perform each task
5. Raising Extension Ladder with Tormentor Poles (five-man) (IFSTA 102, Pgs. 102-109)
  - A. Demonstrate flat raise
  - B. Divide students into groups of five
  - C. Have students perform the task
6. Raising Extension Ladder with Tormentor Poles (six-man)
  - A. Demonstrate flat raise
  - B. Divide students into groups of six
  - C. Have students perform the task

**EVALUATION:**

1. Observation by instructor during the session
2. Each student should be able to perform the tasks covered in this session
3. Follow up with other sessions to allow students to improve in speed and efficiency

**TASK PERFORMANCE:**

Tasks No. 16, 20

## FFI - 6G "WORKING FROM RAISED EXTENSION LADDERS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Advancing hose up ladders
- Securing ladders to buildings
- Using hose streams from ladders
- Securing personnel to ladders
- Advancing from ladder into building

Teach the following skills:

- Advancing hose up ladder
- Tying-in ladder to building
- Two-man team secured to ladder
- Using hose streams from ladder
- Advancing from ladder into building

### INSTRUCTOR REFERENCES:

1. IFSTA 101, Pg. 126 (Rope Hose Tool)
2. IFSTA 103, Pg. 250 (Advancing Hose Up a Ladder)
3. IFSTA 103, Pg. 252 (Passing Hose Up Ladder)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. NFPA Hose-ladder Manual, Pgs. 68-70

### MATERIALS, EQUIPMENT:

1. Apparatus with extension ladder (24 feet or longer)
2. Up to 150 feet of 1 1/2 inch hose with nozzle
3. Up to 200 feet of 2 1/2 inch hose with nozzle
4. Rope hose tool
5. Life belt

### DESCRIPTION OF DRILL:

This drill should emphasize advancing hose up ladders; tying-in ladders to buildings; using hose streams from ladders; and advancing from ladder into building.

DRILL SETTING:

This drill should be held at the training ground or any appropriate location with adequate space where ladders can be raised. Since this drill makes use of ladders already raised, it should be used after proficiency has been gained in carrying and raising extension ladders (FFI - 6B, FFI - 6C, or FFI - 6E). With the limited amount of written material on some of these techniques, department standard operating procedures may be used to fulfill the drill requirements.

## **FFI - 6G "WORKING FROM RAISED EXTENSION LADDERS"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with the knowledge and skills necessary to properly advance hose up ladders, secure ladders to buildings, utilize hose streams while secured to a ladder, secure personnel to ladders, and advance from a ladder into a building.

### **COVERAGE:**

This session shall include common tasks performed in conjunction with ladders including advancing hose, securing personnel, utilizing hose streams, making forcible entry and advancing into a building.

### **MATERIALS:**

1. Apparatus with an extension ladder 24-feet or longer
2. Hose - 150 feet of 1 1/2 inch; 200 feet of 2 1/2 inch
3. Nozzles - one 1 1/2 inch nozzle; one 2 1/2 inch nozzle
4. Rope hose tool
5. Life belt
6. Forcible entry tools.
7. Complete set of protective clothing for each participating member

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA 101, Pg. 126 (Rope Hose Tool)
  - IFSTA 103, Pg. 250 (Advancing Hose Up a Ladder)
  - IFSTA 103, Pg. 252 (Passing Hose Up a Ladder)
2. Make ready an area suitable for raising ladders and performing the tasks outlined in this session
3. Make ready equipment and tools needed for this session

### **INTRODUCTION:**

Discuss with your students the importance of quick, efficient operations as related to tasks performed in conjunction with ladders. Emphasize rescue and suppression activities either through past experiences or potential problems you might be faced with during day-to-day activities.

**PRESENTATION:**

1. Advancing Hose Up a Ladder (IFSTA 101, Pg. 251)
  - A. Demonstrate - considering the following items:
    - (1) Climb about 10 feet apart
    - (2) Allow 20 to 25 feet of hose between each man
    - (3) Loop hose over shoulder
    - (4) Have a man feed hose at base of ladder
  - B. Divide students into groups of four or five
  - C. Have students perform the task
2. Tying-in Ladder to Building
  - A. Demonstrate
    - (1) Utilizing rope hose tool
    - (2) Attach hook to window casing or ledge of building
    - (3) Attach rope hose tool to ladder with clove hitch
  - B. Have students perform the task
3. Two-man Teams Secure to Ladder
  - A. Demonstrate
    - (1) Leg-lock (both men)
    - (2) Crotch hold
      - (a) Lower man one rung below upper man
      - (b) Lower man secures rung of ladder with left hand between upper man's legs
    - (3) Body Hold
      - (a) Lower man puts arm around upper man's side
      - (b) Lower man grasps convenient rung
  - B. Divide members into groups of two
  - C. Have each group perform the task
4. Using Hose Streams from Ladder
  - A. Demonstrate
    - (1) Advancing nozzle to point of operation
    - (2) Placing nozzle in operation
    - (3) Straightening and adjusting hose to center of ladder
    - (4) Securing hose
    - (5) Second man move up, supporting nozzleman
    - (6) Both men securing to ladder
  - B. Divide members into groups of two
  - C. Have each group perform the task, rotating positions
5. Advancing from Ladder into Building
  - A. Demonstrate
    - (1) Placing ladder to side of opening
    - (2) Upper man entering window opening
    - (3) Lower man feeding hose
    - (4) Lower man tying off hose with rope hose tool
    - (5) Lower man entering and backing up nozzleman
  - B. Divide members into groups of two
  - C. Have members perform the task

EVALUATION:

1. Observation by instructor during the session
2. Each student should be able to perform the tasks covered in this session
3. Follow up with other sessions to allow students to improve speed and efficiency

TASK PERFORMANCE:

Tasks No. 15,21

## FFI - 6H "SPECIAL LADDER CARRIES, RAISES AND USES"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of:

--Meeting emergencies which require special ladders or raises

Teach the following skills:

--Moving vertically positioned ladders

--Hotel raise

--Dome raise

--Hoisting ladders

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 102, Lessons 10 and 11
2. IFSTA 102, Pgs. 110-126
3. IFSTA 104, Pg. 78 (Used in Applying Sprinkler Tongs)
4. IFSTA 107, Pg. 116 (A-frame Installation)
5. IFSTA 206, Pg. 72 (A-frame Carried on Rescue Apparatus)
6. IFSTA 206, Pgs. 219-224 (Used in Aircraft Rescue)
7. IFSTA 206, Pg. 229 (A-frame Used in Rescuing Pilot)

### MATERIALS, EQUIPMENT:

1. A-frame ladder
2. Attic ladder
3. Baby extension ladder
4. Extension ladder with poles
5. Two ropes 125 feet in length

### DESCRIPTION OF DRILL:

This drill should emphasize the different uses of the combination (A-frame) ladder, attic ladder, and baby extension ladder. The hotel and dome raises should be demonstrated. The proper technique of hoisting ladders should also be emphasized.



**DRILL SETTING:**

This drill should be held at the training ground or an appropriate location where extension ladders with poles can be utilized. The students should be divided into teams to perform raises as indicated. If all equipment is not available for this drill, a short classroom session should be held with visual aids to depict equipment required for this drill.

## **FPI - 6H "SPECIAL LADDER CARRIES, RAISES, AND USES"**

### **TIME:**

1 hour

### **OBJECTIVES:**

To provide the student with the knowledge and skills necessary to perform special tasks which may be required during emergency situations. With regard to ladder operations, these skills include moving extended ladders; hoisting ladders and raising ladders using the hotel and dome methods.

### **COVERAGE:**

Moving extended ladders; hoisting ladders; raising ladders using the hotel and dome methods; uses of A-frame; and attic ladders

### **MATERIALS:**

1. A-frame ladder
2. Attic ladder
3. Extension ladder with tormentor poles
4. Two 125-foot ropes
5. Full protective clothing for each participating member

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 102, Lessons 10 and 11
  - IFSTA 102, Pgs. 110-126
  - IFSTA 104, Pg. 78 (Used in Applying Sprinkler Tongs)
  - IFSTA 107, Pg. 116 (A-frame Installation)
  - IFSTA 206, Pg. 72 (A-frame Carried on Rescue Apparatus)
  - IFSTA 206, Pgs. 219-224 (Ladders Used in Aircraft Rescue)
  - IFSTA 206, Pg. 229 (A-frame Used in Rescuing a Pilot)
2. Make ready an area suitable for raising, moving, and hoisting ladders

### **INTRODUCTION:**

Discuss with your students situations whereby special skills and raises must be used during ladder operations. Illustrate areas within your responsible area where special operations such as raising ladders by the "hotel" raise and "dome" raise could be utilized.

PRESENTATION:

1. Moving Vertically Positioned Ladders (IFSTA 102, Pgs. 114-116)
  - A. - Demonstrate
    - (1) Movement to the right
    - (2) Movement to the left
    - (3) Rolling a ladder
  - B. Have students perform the tasks
2. Hotel Raise (IFSTA 102, Pg. 120)
  - A. Demonstrate
  - B. Divide members into groups of six or seven
  - C. Have students perform the task
3. Dome Raise (IFSTA 102, Pgs. 118-119)
  - A. Demonstrate
  - B. Divide members into groups of six or seven
  - C. Have students perform the task
4. Hoisting Ladders (IFSTA 102, Pgs. 123-136)
  - A. Demonstrate
  - B. Have students perform the task

EVALUATION:

1. Observation by instructor during the session
2. Each student should be able to perform the tasks covered in this session
3. Follow up with other sessions to allow students to improve in speed and efficiency

TASK PERFORMANCE:

Tasks No. 16, 17

## FFI -- 61 "PREPARING AERIAL LADDER FOR OPERATION"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of the following:

- Types of aerial ladder apparatus
- Operating aerial ladder apparatus
- Positioning aerial ladder
- Safety precautions while working with aerial ladder

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 106, Lessons 10 and 11
2. IFSTA 106, Pgs. 103-132 (Operating Aerial Ladder Apparatus)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. NFPA Publication "Fire Officer's Guide to Operating Aerial Ladders"
  - Chapter 1, Pgs. 1-6 (Types of Aerial Ladder Trucks)
  - Chapter 2, Pgs. 7-18 (Features of Aerial Ladders)
  - Chapter 3, Pgs. 19-38 (positioning on the Fireground)
2. NFPA Publication "Fire Department Aerial Ladders"
  - Chapter 1, Pgs. 1, 2 (History of the Aerial Ladder)
  - Chapter 3, Pgs. 9-12 (Factors Involved in Aerial Ladder Operation)
  - Chapter 4, Pgs. 12-17 (Stabilizing the Truck)
  - Chapter 5, Pgs. 18-23 (Operating Procedures)
  - Chapter 8, Pgs. 76-82 (Safety Precautions for Operating Aerial Ladders)

### INSTRUCTOR MATERIALS:

1. NFPA Aerial Ladder Slides (NFPA NOSL - 10 recommended if available)
2. Slide projector, screen

DESCRIPTION OF DRILL:

This drill should familiarize the student with aerial ladder apparatus. It should emphasize the different types of aerial ladders; operating aerial ladders; stabilizing aerial ladders; and safety precautions dealing with aerial ladders.

DRILL SETTING:

This drill should be held in the classroom since most departments do not have an aerial ladder. The use of the NFPA Aerial Ladder Slides (NFPA NOSL - 10) is recommended in presenting this drill.

## FFI - 6I "PREPARING AERIAL LADDER FOR OPERATION"

### TIME:

1 hour

### OBJECTIVES:

To develop a basic understanding of the types of aerial ladder apparatus, procedures in operating aerial ladder apparatus, positioning aerial ladders, and safety precautions involved while working with aerial ladders.

### COVERAGE:

Basic aerial ladder operations, including safety principles as they apply

### MATERIALS:

1. Aerial ladder apparatus (for demonstration)
2. NFPA Aerial Ladder Slides (NFPA NOSL - 10)
3. Slide projector, screen
4. Chalkboard, chalk

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 106, Lessons 10 and 11
  - IFSTA 106, Pgs: 103-132 (Operating Aerial Ladder Apparatus)
2. Arrange for aerial ladder demonstration
3. Make ready a suitable classroom area

### INTRODUCTION:

Discuss the importance of aerial ladder operations during fire or rescue problems which require elevation to considerable heights, or maneuvering where normal ladders would not be accessible. Also discuss possible mutual or automatic aid situations whereby members of your department could possibly be called upon to assist in operation of an aerial ladder from another fire department.

**PRESENTATION:**

1. Show Slide Program NFPA NOSL - 10 (if available)
  - A. Discuss program
  - B. Discuss questions which arise
2. Aerial Ladder Types
  - A. Aerial ladder with or without ground ladders
  - B. Aerial ladder with pump, hose, ground ladders "quint"
  - C. Ground ladders, pump, hose "quad"
3. Operating Aerial Ladder Apparatus (IFSTA 106, Pgs. 104-132)
  - A. Discuss the following:
    - (1) Construction (truss)
    - (2) Hoisting cylinders and extension cables
    - (3) Turntable
    - (4) Control pedestals
    - (5) Locks and stops
    - (6) Stabilizing jacks
4. Preparing Aerial Ladders for Use
  - A. Set brakes and engage hydraulic pump
  - B. Place wheel chocks
  - C. Stabilize the apparatus
5. Positioning Aerial Ladder
  - A. Elevate
    - (1) Slow, even, steady operation
    - (2) Judgement of operator
    - (3) Slightly higher than required
  - B. Rotate
    - (1) Slow and steady
    - (2) Stop with slow, steady action
  - C. Extend fly sections
    - (1) Slow, even, steady operation
    - (2) Extend well above objective
  - D. Lower to objective
    - (1) Slowly, evenly, steadily
    - (2) When position is reached, position all locks
6. Safety Precautions
  - A. Operate on even ground - not to exceed 20°
  - B. Observe maximum load capacity recommendations
  - C. Always set brakes and outriggers
  - D. Precautions should be taken while working around power lines
  - E. Avoid water hammer during master stream operations
  - F. Operator should never leave platform
  - G. Operator should guard controls
  - H. Make sure everything is secure at termination of operation
  - I. Operators should always face outward from the vertical line of the turntable

**EVALUATION:**

1. Oral or written examination on the types of aerial ladders and their major components
2. Students should be able to list procedures in order of occurrence necessary to put an aerial ladder in operation

**TASK PERFORMANCE:**

Task No. 23



**FFI - 7 HOSE,  
NOZZLES AND APPLIANCES**

<b>FFI - 7A</b>	<b>Fire Hose - Construction, Care and Testing; Fire Hose Couplings</b>	<b>2 hours</b>
<b>FFI - 7B</b>	<b>Hose Appliances and Tools</b>	<b>2 hours</b>
<b>FFI - 7C</b>	<b>Fire Hose Rolls</b>	<b>2 hours</b>
<b>FFI - 7D</b>	<b>Hose Connections</b>	<b>2 hours</b>
<b>FFI - 7E</b>	<b>Fire Hose Carries and Drags</b>	<b>2 hours</b>
<b>FFI - 7F</b>	<b>Accordion Load; Loading and Advancing</b>	<b>2 hours</b>
<b>FFI - 7G</b>	<b>Horseshoe Load; Loading and Advancing</b>	<b>2 hours</b>
<b>FFI - 7H</b>	<b>Flat Load; Loading and Advancing</b>	<b>2 hours</b>
<b>FFI - 7I</b>	<b>Hose Load Finishes</b>	<b>2 hours</b>
<b>FFI - 7J</b>	<b>Loading and Advancing 1 1/2 Inch Hose and Booster Lines</b>	<b><u>2 hours</u></b>

**TOTAL 20 hours**

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# **FFI - 7A "FIRE HOSE - CONSTRUCTION, CARE AND TESTING; FIRE HOSE COUPLINGS"**

## **TIME:**

**.2 hours**

## **OBJECTIVES:**

**Develop a basic understanding of the following:**

- Various types of fire hose**
- Various sizes of fire hose**
- Material, care and construction of different types of fire hose**
- Testing Procedures**
- Various types of fire hose couplings**
- Material, construction and care of fire hose couplings**

## **INSTRUCTOR REFERENCES:**

- 1. IFSTA Instructor's Guide Sheet 103, Lessons 1 and 2**
- 2. IFSTA 103, Pgs. 7-44**
- 3. IFSTA 106, Pg. 41 (Spotting Apparatus for Suction Hose Use)**

## **SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:**

- 1. NFPA 196-8, Article 4 (Diameter and Length)**
  - 196-32 (Lining and Cover)**
  - 196-31 (Jackets)**
- 2. NFPA 198-3-13 (Woven-jacketed, Rubber-lined Hose)**
  - 198-15, Chapter 4 (Unlined Fire Hose)**
  - 198-6-17 (Care of Fire Hose)**
  - 198-80 (Mildew Treatment)**
  - 198-24, Chapter 6 (Washing, Drying and Storage)**
  - 198-8, Article 5 (Hydrostatic Pressure Tests)**
- 3. Fire Protection Handbook - 14th edition**
  - 9-59 (Types of Fire Hose)**
  - 9-59 (Testing Woven-jacketed, Rubber-lined Hose)**
  - 9-58 (Annual Tests)**
  - 9-62 (Service Tests)**
  - 9-64 (Fire Hose Connections)**
  - 9-64 (Attaching Couplings)**
  - 9-63 (Standardization Efforts)**
  - 9-64 (Care and Maintenance of Couplings)**

## **INSTRUCTOR MATERIALS:**

- 1. Chalkboard, chalk**
- 2. Visual Aids**

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**MATERIALS, EQUIPMENT:**

1. Various types of hose material and construction
2. Various types of coupling construction

**DESCRIPTION OF DRILL:**

This drill should emphasize the various types of fire hose; the various size of fire hose; the construction, care and maintenance of fire hose; testing of fire hose; the various types of hose couplings; and construction, care and maintenance of hose couplings.

**DRILL SETTING:**

This drill should be held in the classroom. Students should have the opportunity to examine and discuss construction of fire hose, and the various types of hose and hose couplings.

**FFI - 7A "FIRE HOSE - CONSTRUCTION, CARE AND TESTING;  
FIRE HOSE COUPLINGS"**

**TIME:**

2 hours

**OBJECTIVES:**

To provide the student with a basic understanding of fire hose construction, care and testing of fire hose, and a basic understanding of fire hose couplings.

**COVERAGE:**

Types of fire hose; size of fire hose; material, care and construction of fire hose; testing procedures; types, material, care and construction of fire hose couplings.

**MATERIALS:**

1. Chalkboard, chalk
2. Samples of hose and couplings
3. Visual aids (if available)

**PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 103, Lessons 1 and 2
  - IFSTA 103, Pgs. 7-44
  - IFSTA 106, Pg. 41 (Spotting Apparatus for Suction Hose Use)
2. Make ready materials
3. Make ready classroom

**INTRODUCTION:**

Emphasize to your students the importance of proper care and testing of fire hose. Discuss with your students the need for long life expectancy of fire hose due to cost of repair and replacement. Cite examples of situations where hose failure due to improper care or maintenance would prove disastrous.

**PRESENTATION:**

1. Size and Length
  - A. Discuss various sizes and lengths of hose with reference given to its use
  - B. Present examples of various hose used in your department
  - C. Illustrate advantages and/or disadvantages of each size and length of hose
2. Hose Lining
  - A. Show a cut-away section of hose
  - B. Discuss the lining
    - (1) Formation
    - (2) Function
3. Hose Jacket
  - A. Show section of hose jacket
  - B. Discuss how it is formed
4. Discuss reinforced rubber hose
5. Discuss unlined woven hose
6. Care of Fire Hose
  - A. Show damaged hose (if available)
  - B. Discuss mildew and mold
  - C. Discuss chemical contacts
  - D. Discuss washing, drying and storage
7. Fire Hose Testing Procedures - Discuss method of hose testing used by your department
8. Fire Hose Couplings
  - A. Show samples of couplings
    - (1) Indicate names of various parts
    - (2) Discuss importance of each part
  - B. Discuss method of attaching couplings
  - C. Discuss importance of standardizing threads
  - D. Discuss care of hose couplings

**EVALUATION:**

Develop and administer an oral or written examination covering the items presented in this lesson.

**TASK PERFORMANCE:**

Task No. 24

## FFI -7B "HOSE APPLIANCES AND TOOLS"

### TIME:

2 hours

### OBJECTIVES:

- Develop a basic understanding of the following:
- Identification of hose appliances and tools
  - Use and care of hose appliances and tools

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 103, Lesson 3
2. IFSTA 103, Pgs. 45-55
3. IFSTA 302, Pg. 17 (Fire Apparatus)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition
  - 9-53 (Equipment to Be Carried on Pumper)
  - 9-65 (Nozzles)
  - 9-64 (Coupling Adapters)

### INSTRUCTOR MATERIALS:

1. Chalkboard, chalk
2. Visual aids

### MATERIALS, EQUIPMENT:

1. Wye hose appliance
2. Siamese hose appliance
3. Any special nozzles
4. Adapters/reducers
5. Double males
6. Double females
7. Hydrant gate or gates
8. Hydrant wrench
9. Hose clamp tool
10. Rope hose tool
11. Hose jacket tool
12. Hose bridges
13. Spanner wrenches
14. Rubber mallet
15. Hose roller

DESCRIPTION OF DRILL:

This drill should emphasize the identification of various hose appliances and tools, uses, and care.

DRILL SETTING:

This drill could be held in the classroom, engine room or training ground where hose appliances and tools can be laid out, examined and discussed. If the department does not have all the equipment that is necessary for this topic, visual aids can be used. Each student should be able to identify each appliance or tool and its location on the apparatus.

## **FFI - 7B "HOSE APPLIANCES AND TOOLS"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of hose appliances and tools.

### **COVERAGE:**

Use and care of wye hose appliance; siamese hose appliance ; special nozzles; adaptors and reducers; double males and females; hydrant gates; hydrant wrench; hose clamp tool; hose rope tool, hose jacket tool; hose bridges; spanner wrenches; rubber mallet; hose roller; and location of appliances and tools on the apparatus.

### **MATERIALS:**

1. Display table
2. Appliances and tools utilized by your department
3. Department apparatus
4. Visual aids

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 103, Lesson 3
  - IFSTA 103, Pgs. 45-55
  - IFSTA 302, Pg. 17
2. Make ready appliances and tools
3. Make ready display table
4. Make ready classroom

### **INTRODUCTION:**

Emphasize the importance of being able to identify the use and care of various types of appliances and tools. Discuss the importance of knowing where to locate them on apparatus and how to use them during fire ground operations.



**PRESENTATION:**

1. Fire Hose Nozzles
  - A. Present examples of various nozzles
  - B. Discuss use of various nozzles
  - C. Show students where nozzles are located on apparatus
  - D. Explain how to inspect and care for nozzles
2. Hose Wye Appliances
  - A. Present examples of wyes
  - B. Discuss use of wyes
  - C. Show students where wyes are located on apparatus
  - D. Explain how to inspect and care for wyes
3. Siamese Hose Appliance
  - A. Present example of a siamese
  - B. Discuss use of a siamese
  - C. Show students where siameses are located on apparatus
  - D. Explain how to inspect and care for siameses
4. Water Thief Hose Appliance
  - A. Present a water thief
  - B. Discuss the use of a water thief
  - C. Show students where the water thief(s) are located on the apparatus
  - D. Explain how to inspect and care for water thieves
5. Special Hose Appliance
  - A. Present examples of special hose appliances (IFSTA 103, Pg. 48)
  - B. Discuss the use of various special hose appliances
  - C. Show students where the various special hose appliances are located on the apparatus
  - D. Explain how to inspect and care for each special hose appliance
6. Hose Hoist Tool
  - A. Present a hose hoist tool
  - B. Discuss the use of a hose hoist tool
  - C. Show students where the hose hoist tool is located on the apparatus
  - D. Explain how to inspect and care for a hose hoist tool
7. Hose Jacket Tool
  - A. Present a host jacket tool
  - B. Discuss the use of a hose jacket tool
  - C. Show students where the hose jacket tool is located on the apparatus
  - D. Explain how to inspect and care for a hose jacket tool
8. Hose Clamp Tools
  - A. Present various hose clamp tools
  - B. Discuss the use of various hose clamp tools
  - C. Show students where hose clamp tools are located on the apparatus
9. Hose Spanners and Hydrant Wrenches
  - A. Present hose spanners and hydrant wrenches
  - B. Discuss the use of hose spanners and hydrant wrenches
  - C. Show students where hose spanners and hydrant wrenches are located on the apparatus
  - D. Explain how to inspect and care for fire hose controls
10. Fire Hose Controls
  - A. Present a fire hose control
  - B. Discuss the use of a fire hose control
  - C. Show students where the fire hose controls are located on the apparatus
  - D. Explain how to inspect and care for fire hose controls

11. Fire Hose Ramps or Bridges
  - A. Present a fire hose ramp or bridge
  - B. Discuss the use of a fire hose ramp or bridge
  - C. Show students where the fire hose ramps or bridges are located on the apparatus
12. Chafing Blocks
  - A. Present a chafing block
  - B. Discuss the use and purpose of chafing blocks
  - C. Show students where chafing blocks are located on the apparatus
13. Rope Strap, and Chain Hose Tools
  - A. Present a rope strap, and/or chain hose tool
  - B. Discuss the use of rope straps and chain hose tools
  - C. Show the students where rope straps and chain hose tools are located on the apparatus

**EVALUATION:**

1. Develop and administer an oral or written exam covering use and location of the equipment utilized in this session.
2. Periodic re-examination of equipment location is recommended.

**TASK PERFORMANCE:**

Task No. 25

## FFI - 7C "FIRE HOSE ROLLS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Various types of hose rolls
- Need and purpose for various types of hose rolls

Teach the following skills:

- Skills in hose rolls used by the department

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 103, Lesson 4
2. IFSTA 103, Pgs. 59-87

### MATERIALS, EQUIPMENT:

1. 2 1/2-inch hose (one section for every two or four students)
2. 1 1/2-inch hose (one section for every two or four students)

### DESCRIPTION OF DRILL:

This drill should emphasize the various hose rolls and the need and purpose of various hose rolls used by the department.

### DRILL SETTING:

This drill should be held at the training ground or any suitable location. Each student should show proficiency in making the different rolls used by his department, including rolls for storage, load finishes, hose bundles and picking up hose.

## FFI - 7C "FIRE HOSE ROLLS"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of hose rolls and the skills necessary to roll hose properly.

### COVERAGE:

Straight roll; donut roll (one and two-man); twin donut roll; self-locking hose roll; bundle fold; special hose pack; and any other type or variation of hose rolls used in your department

### MATERIALS::

1. 1 1/2-inch hose (one section per two to four students)
2. 2 1/2-inch hose (one section per two to four students)

### PREPARATION:

1. Review the following material as you feel necessary:  
--IFSTA Instructor's Guide Sheet 103, Lesson 4  
--IFSTA 103, Pgs. 59-87
2. Make ready hose
3. Make ready area suitable for rolling hose

### INTRODUCTION:

Due to the amount of material to be covered in this session, emphasize the need for cooperation. Indicate that hose in a convenient roll is easier to carry, advance, store, load and pick up.

### PRESENTATION:

In each of the following, first demonstrate the hose roll, then have students perform the task:

1. Donut Roll (IFSTA 103, Pgs. 59-68)
2. Twin Donut Roll (IFSTA 103, Pgs. 69-72)
3. Self-Locking Hose Roll (IFSTA 103, Pgs. 73-78)
4. Bundle-Fold (IFSTA 103, Pgs. 79-84)
5. Special Hose Pack (IFSTA 103, Pg. 85)
6. Special Rolls Used in your department

EVALUATION:

1. Observation of students during the session.
2. Select rolls at random and have various students perform the task.
3. Follow-up with additional sessions allowing students to improve efficiency.

TASK PERFORMANCE:

Task No. 26

## FFI - 7D "HOSE CONNECTIONS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Different hose connections
- Advantages and disadvantages of each job assignment

Teach the following skills:

- Coupling connection
- Nozzle connection
- Pumper connection
- Hydrant connection
- Sprinkler and standpipe connection

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 103, Lessons 5 and 7
2. IFSTA 103, Pgs. 88-124, 158

### MATERIALS, EQUIPMENT:

1. Pumper
2. 2 1/2 - inch hose (one section for every two or four students)

### DESCRIPTION OF DRILL:

This drill should emphasize different hose connections to make the process simple and quick, and job assignments for coordinated hose operations.

### DRILL SETTING:

This drill should be held at the training ground or any suitable location. The students should show proficiency in making coupling connections, nozzle connections, pumper connections, hydrant connections, and sprinkler and standpipe connections.

## FFI - 7D "HOSE CONNECTIONS"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of various hose connections and develop skills necessary to perform related tasks.

### COVERAGE:

Coupling hose (one and two-man methods); breaking a tight coupling; attaching a nozzle to hose; hydrant connections; intake pump connections; connecting hose to devices and appliances

### MATERIALS:

1. 2 1/2 - inch hose (one section for every two to four students)
2. Pumper
3. Various devices and appliances

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 103, Lessons 5 and 7
  - IFSTA 103, Pgs. 88-124, 158
2. Make area suitable for connecting hose
3. Make ready hose, various devices, and appliances

### INTRODUCTION:

Emphasize the importance of student participation during this session. Discuss the need for quick, efficient hose connections on the fire scene. Have students cite situations where good quick connection of hose would be critical.

### PRESENTATION:

In each of the following hose connections, first demonstrate the various methods, then have the students perform the task.

1. Coupling Hose (one-man) (IFSTA 103, Pgs. 88-91)
  - A. Advantages of each method
  - B. Disadvantages of each method

2. Coupling Hose (two-man) (IFSTA 103, Pg. 92)
3. Breaking a Tight Coupling (IFSTA 103, Pgs. 95-96)
4. Attaching a Nozzle to Hose (IFSTA 103, Pgs. 95-96)
  - A. Advantages of each method
  - B. Disadvantages of each method
5. Making Hydrant Connections (IFSTA 103, Pgs. 97-103)

*Variations used by your department should be taught during the following operations.*

  - A. Advantages of each method
  - B. Disadvantages of each method
6. Intake Pump Connections (IFSTA 103, Pgs. 104-115)
7. Special Pump Connections (IFSTA 103, Pgs. 115-119)
8. Connecting to Devices and Appliances (IFSTA 103, Pgs. 120-124)

**EVALUATION:**

1. Observation of students during session.
2. Students should be able to perform each task covered during the session.
3. Follow up with additional sessions to allow students to improve efficiency.

**TASK PERFORMANCE:**

Tasks No. 27, 28, 61



## FFI - 7E "FIRE HOSE CARRIES AND DRAGS"

### TIME:

2 hours

### OBJECTIVES:

- Develop a basic understanding of the following:
  - Technique of hose drags
  - Technique of hose carries
  - Special fire hose operations

Teach the following skills:

- Picking up slack in hose lines
- Retrieving a "wild line"
- Replacing a section of hose
- One-man operation of large fire streams
- Street drag
- Working line drag
- Shoulder, shoulder loop, or underarm carries

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 103, Lessons 6 and 7
2. IFSTA 103, Pgs. 125-158

### MATERIALS, EQUIPMENT:

1. 2 1/2-inch hose (one section for every 2 or 4 students)
2. Pumper

### DESCRIPTION OF DRILL:

This drill should emphasize the various hose drags and carries used within the department; also the procedure for retrieving a "wild line"; replacing a section of hose; and one-man operation of a large fire stream.

### DRILL SETTING:

This drill should be held at the training grounds or any suitable location. Each student should show proficiency in skills required in this lesson.

## FFI - 7E "FIRE HOSE CARRIES AND DRAGS"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of hose carries and drags, and the skills required to perform tasks involved.

### COVERAGE:

Carrying the nozzle end; the accordian-shoulder carry; underarm carry; shoulder-loop carry; working-line drag; street drag; picking up slack in hose lines; retrieving a charged 'wild line'; replacing a section of hose; one-man operation of a large fire stream; other types of hose carries or drags utilized by your department

### MATERIALS:

1. Area suitable for carrying and dragging hose
2. 2 1/2 - inch hose (one section for every two to four students)
3. Pumper

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 103, Lessons 6 and 7
  - IFSTA 103, Pgs. 125-158
2. Make ready materials
3. Divide area into stations depending on instructor availability

### INTRODUCTION:

Emphasize the importance of strict discipline and student participation in this session. Note the importance of proper drags and carries in reference to quick hose line advancement, efficient fire attack, and personnel safety.

**PRESENTATION:**

In each of the following hose carries and drags, first demonstrate all methods, then have students perform the task:

1. Carrying the Nozzle End (IFSTA 103, Pg. 125) - State protection factors
2. Accordion Shoulder Carry (IFSTA 103, Pgs. 126-138)
3. Underarm Carry (IFSTA 103, Pg. 139-140)
4. Shoulder-Loop Carry (IFSTA 103, Pgs. 141-147)
5. Working-Line Drag (IFSTA 103, Pgs. 148-149)
6. Street Drag (IFSTA 103, Pg. 150-152)
7. Department Variations (*Use this opportunity to cover any different types or variations used by your department.*)
8. Special Fire Hose Operations (IFSTA 103, Pgs. 153-158)
  - A. Picking up slack
  - B. Retrieving a "wild line"
  - C. Replacing a section of hose
  - D. One-man operation of a large fire stream

**EVALUATION:**

1. Observation of students during session.
2. Students should be able to perform each task covered during session.
3. Follow up with other sessions to allow students to improve on efficiency.

**TASK PERFORMANCE:**

Tasks No. 29, 30

## **FFI - 7F "ACCORDIAN LOAD: LOADING AND ADVANCING"**

### **TIME:**

2 Hours

### **OBJECTIVES:**

Develop a basic understanding of the following:

- Requirements for hose bed or compartments
- Advantages of accordian load
- Disadvantages of accordian load
- Loading accordian load
- Advancing accordian loaded hose

Teach the following skills:

- Loading accordian load
- Advancing accordian loaded hose

### **INSTRUCTOR REFERENCES:**

1. IFSTA Instructor's Guide Sheet 103, Lesson 8
2. IFSTA 103, Pgs. 161-174

### **SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:**

NFPA 1901, Chapter 3 (Provisions Applying to Apparatus Equipped with a Hose Body)

### **MATERIALS, EQUIPMENT:**

1. Pumper with accordian load
2. 2 1/2-inch or 3-inch hose

### **DESCRIPTION OF DRILL:**

This drill should emphasize the advantages and disadvantages of the accordian load, and loading and advancing hose from the accordian load.

### **DRILL SETTING:**

This drill should be held at the training ground or any suitable location. At least 250 feet of 2 1/2-inch or 3-inch hose should be stretched from pumper. This evolution should be practiced until proficiency is gained in loading and advancing accordian loaded hose. If the department does not use the accordian load, then this time should be spent on the load used (FFI-7G or FFI-7H).

## **FFI - 7F "ACCORDIAN LOAD: LOADING AND ADVANCING"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of the accordian load and skills necessary to load and advance it. (If your department does not utilize the accordian load, provide instruction relating to the types used.)

### **COVERAGE:**

Requirements; disadvantages and advantages of the accordian load; loading the accordian load; advancing the accordian loaded hose

### **MATERIALS:**

1. Area suitable for loading and advancing hose
2. 250 feet of 2 1/2-inch or 3-inch hose
3. Pumper with empty hose bed

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 103, Lesson 8
  - IFSTA 103, Pgs. 161-174
2. Make ready materials

### **INTRODUCTION:**

Emphasize the importance of student participation in this session. Note the importance of systematic, neat loading and unloading. Discuss difficulties experienced through improper loading of hose. Have students give their thoughts as to the advantages and disadvantages of the accordian load.

### **PRESENTATION:**

1. Fire Hose Compartments (IFSTA 103, Pgs. 161-163)
  - A. Reverse lay
  - B. Straight lay
  - C. Capacity of hose compartments

2. General Loading Factors (IFSTA 103, Pgs. 164-165)
  - A. "Hose bed" - front and rear
  - B. Basic rules
3. Loading Procedures (IFSTA 103, Pgs. 170-173)
  - A. Demonstrate loading of hose
  - B. Have students perform the task
4. Unloading and Advancing Reverse Layout (IFSTA 103, Pgs. 170-173)
  - A. Demonstrate to students
  - B. Have students perform the task
5. Unloading and Advancing Forward Layout (IFSTA 103, Pg. 174)
  - A. Demonstrate to students
  - B. Have students perform the task

EVALUATION:

1. Observation of students during session.
2. Students should be able to perform each task covered during this session.
3. Follow-up with additional sessions allowing students to improve efficiency.

TASK PERFORMANCE:

Tasks No. 29, 31

## **FFI - 7G "HORSESHOE LOAD; LOADING AND ADVANCING"**

### **TIME:**

2 hours

### **OBJECTIVES:**

Develop a basic understanding of the following:

- Advantages of horseshoe load
- Disadvantages of horseshoe load
- Loading horseshoe load
- Advancing horseshoe loaded hose

Teach the following skills:

- Loading horseshoe load
- Advancing horseshoe load

### **INSTRUCTOR REFERENCES:**

1. IFSTA Instructor's Guide Sheet 103, Lesson 9
2. IFSTA 103, Pgs. 178-185

### **SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:**

NFPA 198-83 (Typical Hose Loads on Fire Trucks)

### **MATERIALS, EQUIPMENT:**

1. Pumper with horseshoe load
2. 2 1/2-inch or 3-inch hose

### **DESCRIPTION OF DRILL:**

This drill should emphasize the advantages and disadvantages of the horseshoe load; loading and advancing hose from the horseshoe load.

### **DRILL SETTING:**

This drill should be held at the training ground or any suitable location. At least 250 feet of 2 1/2-inch or 3-inch hose should be stretched from pumper. This evolution should be practiced until proficiency is gained in loading and advancing horseshoe load. If the department does not use the horseshoe load, then this time should be spent on the load used (FFI-7F or FFI-7H).

## FFI-7G "HORSESHOE LOAD; LOADING AND ADVANCING"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of the horseshoe load, and the skills necessary to load and advance it. (If your department does not utilize the horseshoe load, provide instruction relating to the types used.)

### COVERAGE:

Loading, unloading, and advancing the horseshoe load; advantages and disadvantages of the horseshoe load

### MATERIALS:

1. Area suitable for loading and advancing hose
2. 250 feet of 2 1/2-inch or 3-inch hose
3. Pumper with empty hose bed

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 103, Lesson 9
  - IFSTA 103, Pgs. 178-185
2. Make ready area and materials

### INTRODUCTION:

Emphasize to your students the importance of strict discipline and student participation in this session. Note the advantages and disadvantages of the horseshoe load.

### PRESENTATION:

If the accordion load is not used by the department, be sure to cover items 1 and 2 under Lesson Plan FFI-7F as the information contained there can relate to any hose lay.



In each of the following, first demonstrate the techniques, then have the students perform the task:

1. Loading Procedure - Horseshoe Load (IFSTA 103, Pgs. 178-181)
2. Unloading and Advancing - Forward or Reverse - Horseshoe Load (IFSTA 103, Pgs. 182-185)
3. Department Variations - *(Use this opportunity to cover any variations of horseshoe load used by the department.)*

EVALUATION:

1. Observation of students during session.
2. Students should be able to perform each task covered in this session.
3. Follow up with other sessions to allow students to improve on efficiency..

TASK PERFORMANCE:

Tasks No. 29, 31

## FFI - 7H "FLAT LOAD; LOADING AND ADVANCING"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Advantages of flat load
- Disadvantages of flat load
- Loading flat load
- Advancing flat load

Teach the following skills:

- Loading flat load
- Advancing flat load

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 103, Lessons 9 and 10
2. IFSTA 103, Pgs. 175-177

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

NFPA 198-83 (Typical Hose Loads on Fire Trucks)

### MATERIALS, EQUIPMENT:

1. Pumper with flat load
2. 2 1/2-inch or 3-inch hose

### DESCRIPTION OF DRILL:

This drill should emphasize the advantages and disadvantages of the flat load; loading and advancing hose from the flat load.

### DRILL SETTING:

This drill should be held at the training ground or any suitable location. At least 250 feet of 2 1/2-inch or 3-inch hose should be stretched from pumper. This evolution should be practiced until proficiency is gained in loading and advancing flat load. If the department does not use the flat load, then this time should be spent on the load used (FFI-7F or FFI-7G).

## FFI - 7H "FLAT LOAD; LOADING AND ADVANCING"

### TIME:

2 hours

### OBJECTIVES:

To provide students with a basic understanding of the flat load and the skills necessary to load and advance it.

### COVERAGE:

Loading flat load; unloading flat load; advancing flat load

### MATERIALS:

1. Area suitable for loading and advancing hose
2. 250 feet of 2 1/2-inch or 3-inch hose
3. Pumper with empty hose bed

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 103, Lessons 9 and 10
  - IFSTA 103, Pgs. 175-177
2. Make ready area and materials

### INTRODUCTION:

Emphasize to your students the importance of student participation during this session. Discuss advantages and disadvantages of the flat load.

### PRESENTATION:

For each of the following, first demonstrate the techniques, then have students perform the task:

1. Loading Procedure (IFSTA 103, Pgs. 175-176)
2. Unloading and Advancing Reverse Layout (IFSTA 103, Pg. 177)
3. Unloading and Advancing Forward Layout (IFSTA 103, Pg. 177)
4. Department Variations - (Use this opportunity to cover any hose loads unique to your department.)

**EVALUATION:**

1. Observation of students during session.
2. Students should be able to perform each task covered in this session.
3. Follow up with additional session allowing students to improve efficiency.

**TASK PERFORMANCE:**

Tasks No. 29, 31

## FFI - 71 "HOSE LOAD FINISHES"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Purpose of various load finishes
- Advantages of different load finishes
- Purpose of forward lay hose
- Purpose of reverse lay hose

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 103, Lesson 11
2. IFSTA 103, Pgs. 186-216

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

NFPA 198-83 (Typical Hose Loads on Fire Trucks)

### MATERIALS, EQUIPMENT:

Pumper

### DESCRIPTION OF DRILL:

This drill should emphasize the purpose of various hose load finishes; the advantages of each; and the purpose of forward and reverse lay hose.

### DRILL SETTING:

This drill should be held at the training ground or any suitable location. The student should practice the finished load used by the department.

## FFI - 71 "HOSE LOAD FINISHES"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of the purpose, advantage, and disadvantage to hose load finishes, the reverse lay, and the forward lay; to gain the skills necessary to make the hose load finishes discussed in this lesson. (If the department does not use any of the methods discussed in this lesson, use the time available to work on the methods used.)

### COVERAGE:

Skid-load finish (2 1/2-inch reverse lay, 1 1/2-inch reverse lay); cisco load (1 1/2-inch reverse lay); reverse horseshoe load finish (1 1/2-inch); department variations

### MATERIALS:

1. Area suitable for loading and advancing hose
2. 200 feet of 2 1/2-inch hose
3. 200 feet of 1 1/2-inch hose
4. Pumper with loaded hose bed

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 103, Lesson 11
  - IFSTA 103, Pgs. 186-216
2. Make ready area and materials
3. Divide area into groups depending on number of instructors and pumpers

### INTRODUCTION:

Emphasize to your students the importance of strict discipline and student participation in this session. Note the need for hose load finishes in reference to the different types of application at the fire scene.

### PRESENTATION:

Demonstrate each of the following hose load finishes. Then have students perform the task.

1. Skid Load Finish - Loading Procedure (2 1/2-inch reverse lay) (IFSTA 103, Pgs. 191-193)
2. Unloading and Advancing Skid Load (2 1/2-inch reverse lay) (IFSTA 103, Pgs. 194-197)
3. Skid Load Finish - Loading Procedure (1 1/2-inch reverse lay) (IFSTA 103, Pgs. 198-200)
4. Unloading and Advancing Skid Load (1 1/2-inch reverse lay) (IFSTA 103, Pgs. 200-204)
5. Cisco Load Finish - Loading Procedure (1 1/2-inch reverse lay) (IFSTA 103, Pgs. 205-207)
6. Unloading and Advancing - Cisco Load (1 1/2-inch reverse lay) (IFSTA 103, Pgs. 208-210)
7. Reverse Horseshoe Load Finish - Loading Procedure (1 1/2-inch hose) (IFSTA 103, Pgs. 211-213)
8. Unloading and Advancing Reverse Horseshoe (1 1/2-inch hose) (IFSTA 103, Pgs. 214-216)
9. Department Variations *(Use this opportunity to cover any variations of hose load finishes used by the department.)*

### EVALUATION:

1. Observation of students during session.
2. Students should be able to perform each task covered in this session.
3. Follow up with other sessions to allow students to improve on efficiency.

### TASK PERFORMANCE:

Task No. 31

**FFI - 7J "LOADING AND ADVANCING 1 1/2-INCH  
HOSE AND BOOSTER LINES"**

**TIME:**

**2 hours**

**OBJECTIVES:**

**Develop a basic understanding of the following:**

- Purpose of various 1 1/2-inch loads**
- Advancing 1 1/2-inch hose**
- Loading 1 1/2-inch hose**
- Purpose of the booster hose reels**

**Teach the following skills:**

- Advancing 1 1/2-inch hose up stairway/ladder**
- Advancing 1 1/2-inch hose into a structure**

**INSTRUCTOR REFERENCES:**

- 1. IFSTA Instructor's Guide Sheet 103, Lessons 12 and 13**
- 2. IFSTA 103, Pgs. 217-253**

**MATERIALS, EQUIPMENT:**

- 1. Pumper**
- 2. 24-foot extension ladder or longer**

**DESCRIPTION OF DRILL:**

**This drill should emphasize the purpose of various 1 1/2-inch loads; the advancing and loading of 1 1/2-inch hose; and the purpose and limitations of the booster line.**

**DRILL SETTING:**

**This drill should be held at the training ground or any suitable location. The students should practice pulling 1 1/2-inch hose into structures and up stairways or ladders until a high level of proficiency is gained.**



**FFI - 7J "LOADING AND ADVANCING 1 1/2-INCH  
HOSE AND BOOSTER LINES"**

**TIME:**

**2 hours**

**OBJECTIVES:**

To provide the student with a basic understanding of the purpose, loading and advancing of various 1 1/2-inch hose loads; and the skills necessary to load and advance the hose loads.. (If the department does not use any of the types discussed in this lesson, then use the time available on the type used.)

**COVERAGE:**

Pre-connected reverse horseshoe load; pre-connected flat load; pre-connected triple-layer load; combination load; booster reels; advancing hose up a stairway; advancing hose up a ladder; passing hose upward; hoisting hose; department variations

**MATERIALS:**

1. Area suitable for advancing hose lines
2. 24-foot extension ladder
3. Pumper with 1 1/2-inch pre-connected lines

**PREPARATION:**

1. Review the following materials as you feel necessary:  
--IFSTA Instructor's Guide Sheet 103, Lessons 12 and 13  
--IFSTA 103, Pgs. 217-253
2. Make ready area and materials
3. Divide area into stations depending on number of instructors and pumpers

**INTRODUCTION:**

Emphasize to your students the importance of strict discipline and student participation in this session. Note the importance of proper hose loading of pre-connected lines in reference to quick and efficient advancement and fire attack.

**PRESENTATION:**

In the following loads and maneuvers, first demonstrate all methods of loading and advancing, then have students perform the task:

1. Pre-connected Reverse Horseshoe Load (IFSTA 103, Pgs. 217-230)
2. Pre-connected Flat Load (IFSTA 103, Pgs. 230-234)
3. Pre-connected Triple Layer Load (IFSTA 103, Pgs. 235-241)
4. Combination Load (IFSTA 103, Pgs. 241-247)
5. Department Variations *(Use this opportunity to cover any variations of loading or advancing 1 1/2-inch lines used by the department.)*
6. Special Hose Maneuvers (IFSTA 103, Pgs. 248-253)
  - A. Advancing and loading booster reels
  - B. Advancing hose up a stairway
  - C. Advancing hose up a ladder
  - D. Passing hose upward
  - E. Hoisting hose

**EVALUATION:**

1. Observation of students during the session.
2. Assign each student a particular task at random.
3. Each student should be able to perform each task covered in this session.
4. Follow up with additional sessions to allow students to improve on efficiency.

**TASK PERFORMANCE:**

Tasks No. 31, 32, 33

## FFI - 8 SALVAGE AND OVERHAUL

FFI - 8A	Introduction to Salvage and Overhaul	2 hours
FFI - 8B	One-Man and Two-Man Salvage Cover Roll and Fold; Methods of Throws and Spreads	2 hours
FFI - 8C	Care and Maintenance of Salvage Covers	2 hours
FFI - 8D	Salvage Kits and Other Salvage Equipment	2 hours
FFI - 8E	Handling Water Run-Off in Structures	2 hours
FFI - 8F	Fire Fighting Functions Prior to Releasing Premises to the Owner	2 hours
FFI - 8G	Releasing Premises to Owner	<u>2 hours</u>
TOTAL		14 hours

## FFI - 8A "INTRODUCTION TO SALVAGE AND OVERHAUL"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Salvage defined
- Overhaul defined
- Fire department responsibility of overhaul and salvage
- Importance of training owners and employees in salvage, storage, and safety prior to and after an emergency

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 104, Lessons 1 and 2
2. IFSTA 104, Pgs. 3-12
3. IFSTA 110, Pgs. 66, 86 (Gathering Facts during Surveys)
4. IFSTA 302, Pgs. 35-71 (Pre-fire Planning)
5. IFSTA 302, Pg. 98 (The Need for Salvage)
6. IFSTA 302, Pg. 108 (Overhaul)
7. IFSTA 107, Pg. 6 (Permits Prompt Salvage Operations) (Ventilation)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. NFPA 604 (Salvaging Operations)  
604, Appendix 1-4302(8), (Fire Departments in Charge of Property)
2. Fire Protection Handbook - 14th edition  
9-3 (Salvage Corps)  
9-7 (Fire Department Organization and Responsibilities)

### INSTRUCTOR MATERIALS:

1. "The Double Edged Sword" (slides and cassette tape)

### DESCRIPTION OF DRILL:

This drill should define salvage and overhaul, emphasizing their importance; the fire department's responsibility during overhaul; and the owner's responsibility before and after an emergency.

### DRILL SETTING:

This drill should be held in the classroom. *If time permits, practice sessions could be held to gain proficiency in the practical skills required of this session.*

## FFI - 8A "INTRODUCTION TO SALVAGE AND OVERHAUL"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of salvage and overhaul and instill into members fire department responsibility and public cooperation as related to salvage and overhaul.

### COVERAGE:

Purpose and scope; fire department responsibility; definition of terms; owner's interest and responsibility; and the value in public relations

### MATERIALS:

1. Chalkboard, chalk
2. "The Double-Edged Sword" (slides and cassette tape)
3. Slide projector and screen

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 104, Lessons 1 and 2
  - IFSTA 104, Pgs. 3-12
2. Make ready classroom

### INTRODUCTION:

Emphasize to your students the importance of correct salvage and overhaul operations. Cite examples of situations where good and/or poor salvage and overhaul operations were used and discuss the effects of each. Although these are two separate functions the same goal is achieved. This goal is "reduce and prevent unnecessary damage to a building or its contents which might otherwise increase fire loss."

### PRESENTATION:

1. Define salvage
2. Present Slide Program ("The Double Edged Sword")
  - A. Stop and elaborate key points
  - B. Have students take mental notes (write later)
3. Discuss Slide Program

4. Define Overhaul
5. Value of Proper Overhaul (discuss each item)
  - A. Helps locate hidden fires
  - B. Helps prevent re-kindle
  - C. Helps determine cause
  - D. Aids investigation
  - E. Helps prevent unnecessary damage
  - F. Permits removal of fire cause
  - G. Aids restoring building
  - H. Helps improve public image
6. Fire Department Responsibility
  - A. Hidden smolders or fires
  - B. Protect point of origin
  - C. Assist in determining cause through proper salvage and overhaul
  - D. Keep damage to a minimum
7. Owner's Interest and Responsibility
  - A. Training employees
  - B. Marking and identifying safety devices
  - C. Providing spacing between stock
8. Value in Public Relations
  - A. Public praise
    - (1) Verbal
    - (2) News media
  - B. Morale builder among firefighters

EVALUATION:

Through the use of a written or oral exam, students should:

- A. Define salvage and overhaul
- B. State fire department responsibility
- C. State owner's responsibility
- D. State value in public relations

TASK PERFORMANCE:

Task No. 34

**FFI - 8B "ONE-MAN AND TWO-MAN SALVAGE COVER ROLL AND FOLD;  
METHODS OF THROWS AND SPREADS"**

**TIME:**

**2 hours**

**OBJECTIVES:**

**Develop a basic understanding of the following:**

- Ability to roll or fold salvage covers**
- Ability to position, spread or throw salvage covers quickly and efficiently**

**Teach the following skills:**

- One-man salvage cover fold**
- One-man salvage cover roll**
- Spread from one-man salvage cover roll**
- Two-man salvage cover fold**
- Carrying and positioning the two-man fold**
- Balloon throw**
- Single-edge snap throw**
- Double-edge snap throw**
- Crossover throw**
- Covering shelves**
- Removing salvage covers**

**INSTRUCTOR REFERENCES:**

- 1. IFSTA Instructor's Guide Sheet 104, Lessons 6 and 7**
- 2. IFSTA 104, Pgs. 29-68**

**SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:**

**NFPA 604-3304 (Fire Department Salvage Operations During Fires)**

**INSTRUCTOR MATERIALS:**

- 1. Salvage covers**
- 2. Furniture (tables)**

**DESCRIPTION OF DRILL:**

**This drill should emphasize the proper method of folding and rolling salvage covers, and spreading or throwing salvage covers by one man or two men.**

**DRILL SETTING:**

This drill should be held in a large enough area where demonstration and practice of the prescribed skills can take place. If moving station furniture is not desirable for demonstration and practice, two tables stacked one on another works sufficiently

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**FFI - 88 "ONE-MAN AND TWO-MAN SALVAGE COVER ROLL AND FOLD:  
METHOD OF THROWS AND SPREADS**

**TIME:**

2 hours

**OBJECTIVES:**

To provide the students with a basic understanding of salvage covers, their uses, and the skills necessary to roll, fold, position, spread, and throw salvage covers utilizing recommended methods.

**COVERAGE:**

One-man fold; one-man roll; spreading a salvage cover from a one-man roll; two-man fold; carrying and positioning the two-man fold; balloon throw; single-edge snap throw; double-edge snap throw; crossover throw; covering shelves; and removing salvage covers

**MATERIALS:**

1. Area suitable for spreading and folding salvage covers
2. Salvage covers utilized in your department
3. Items to be used to throw covers over

**PREPARATION:**

1. Review the following material as you feel necessary:  
--IFSTA Instructor's Guide Sheet 104, Lessons 6 and 7  
--IFSTA 104, Pgs. 29-68
2. Prepare area and make ready materials
3. Divide area into several stations (if possible) depending on availability of instructors

**INTRODUCTION:**

Emphasize the importance of strict, disciplined participation in this session due to amount of tasks to be covered and limited time to cover them. Discuss with your students the importance of performing these tasks efficiently at the fire scene.

**PRESENTATION:**

Demonstrate the following methods. Then have students perform the task.

1. One-Man Salvage Cover Fold and Roll (IFSTA 104, Pgs. 30-41)
2. Spread from One-Man Salvage Cover Roll (IFSTA 104, Pgs. 35-38)
3. Two-Man Salvage Cover Fold (IFSTA 104, Pgs. 46-51)
4. Carrying and Positioning the Two-Man Fold (IFSTA 104, Pgs. 52-54)
5. Balloon Throw (IFSTA 104, Pgs. 54-56)
6. Single-Edge Snap Throw (IFSTA 104, Pgs. 57-58)
7. Double-Edge Snap Throw (IFSTA 104, Pgs. 59-62)
8. The Crossover Throw (IFSTA 104, Pgs. 62-65)
9. Covering Shelves
  - A. Utilize tables
  - B. Utilize shelves, furniture, etc.
10. Removing Salvage Covers
  - A. Precautions
    - (1) Overhead obstructions
    - (2) Fold cover over on itself
    - (3) Start at a corner

**EVALUATION:**

1. Observation of students during session.
2. Students should be able to perform each task covered during the session.
3. Follow up with other sessions to allow students to improve on efficiency.

**TASK PERFORMANCE:**

Task No. 35

## FFI - 8C "CARE AND MAINTENANCE OF SALVAGE COVERS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Types and sizes of salvage covers
- Preparing salvage covers for use
- Testing salvage covers

Teach the following skills:

- Examining salvage covers for damage
- Procedures for testing salvage covers (lake test)

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 104, Lesson 3
2. IFSTA 104, Pgs. 13-17

### INSTRUCTOR MATERIALS:

Salvage covers

### DESCRIPTION OF DRILL:

This drill should emphasize the various types and sizes of salvage covers; testing salvage covers; cleaning, drying, examining for damage; and repairing salvage covers.

### DRILL SETTING:

This drill should be held in a large enough area where the instructor can demonstrate the preparation of salvage covers for use and testing. Visual aids (slides or overheads) could be used to depict cleaning and drying salvage covers. If time permits, practice sessions could be used to increase proficiency in some of the following areas:

- One-man and two-man throws or spread as approved by the department
- One-man and two-man roll and/or fold as prescribed by the department
- Balloon throw
- Single-edge snap throw
- Double-edge snap throw
- Crossover throw

## **FFI - 8C "CARE AND MAINTENANCE OF SALVAGE COVERS"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of the types and sizes of salvage covers and the skills involved in examining and testing salvage covers.

### **COVERAGE:**

Examining salvage covers for damage; procedures involved in testing salvage covers (lake test); cleaning, drying and repairing salvage covers

### **MATERIALS:**

1. Salvage covers
2. Materials necessary for lake test (IFSTA 104, Pg. 14)
3. Area suitable for working with salvage covers

### **PREPARATION:**

1. Review the following materials as you feel necessary:
  - IFSTA Instructor's Guide Sheet 104, Lesson 3
  - IFSTA 104, Pgs. 13-17
2. Make ready materials for lake test
3. Make ready area for conducting the session

### **INTRODUCTION:**

Emphasize to your students the necessity for care and maintenance of salvage covers. Discuss cost, life expectancy, etc. as related to proper or improper care and maintenance of covers.

### **PRESENTATION:**

1. Have students familiarize themselves with:
  - A. Size and type of covers in department
  - B. Location of covers on apparatus
2. Construction of Salvage Covers
  - A. Canvas material
  - B. Gromnets
  - C. Reinforced corners

3. Testing Salvage Covers
  - A. Divide group in half
  - B. Demonstrate examining procedures (IFSTA 104, Pg. 16)
  - C. Demonstrate lake test (IFSTA 104, Pg. 14)
  - D. Have students perform the task
4. Preparing Salvage Covers for Use
  - A. Cleaning (IFSTA 104, Pg. 14)
    - (1) discuss advantages and disadvantages of this method
    - (2) demonstrate to students
    - (3) have students perform the task
  - B. Drying (IFSTA 104, Pg. 15)
    - (1) air dry (like clothes)
      - (a) thoroughly dry
      - (b) prevent mildew
  - C. Repairing
    - (1) discuss your department's methods and procedures
    - (2) read policy (if available)

**EVALUATION:**

Observe student's performance during session. Ask questions related to items covered during the session.

**TASK PERFORMANCE:**

**Task No. 36**

**Note:** If time permits have students perform tasks covered in Lesson Plan FFI-8B (folding and throwing salvage covers).

## **FFI - 8D "SALVAGE KITS AND OTHER SALVAGE EQUIPMENT"**

### **TIME:**

2 hours

### **OBJECTIVES:**

Develop a basic understanding of the following:

- Types of salvage kits used during salvage operations
- Purpose and application of these salvage kits
- Additional tools and equipment used during salvage operations

### **INSTRUCTOR REFERENCES:**

1. IFSTA Instructor's Guide Sheet 104, Lessons 4 and 5
2. IFSTA 104, Pgs. 18-25

### **SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:**

1. NFPA 19-9320 (Some Salvage Kit Items Listed)
2. Fire Protection Handbook - 14th edition, 9-50, 9-54 (Salvage Trucks; Fire Apparatus)

### **INSTRUCTOR MATERIALS:**

Actual kits and equipment, or slides of various salvage kits and equipment

### **DESCRIPTION OF DRILL:**

This drill should emphasize the different types of salvage kits; additional tools and equipment used during salvage operation; purpose; and application.

### **DRILL SETTING:**

This drill should be held in the classroom. Since most departments are not equipped with salvage kits, slides are available on this subject. If some of the equipment is actually available, the use of these items should be demonstrated.

## **FFI - 8D "SALVAGE KITS AND OTHER SALVAGE EQUIPMENT"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of equipment used in salvage kits and other salvage equipment so that they can recognize and identify the various tools and equipment, and relate each to its particular use.

### **COVERAGE:**

Salvage kits; water chutes; carry-all; floor-runner; portable pumps; sawdust bags; and other tools used in salvage operations

### **MATERIALS:**

1. Salvage equipment used in your department
2. Slides of salvage kits or equipment
3. Slide projector and screen
4. Chalkboard, chalk

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 104, Lesson 4 and 5
  - IFSTA 104, Pgs. 18-25
2. Make ready equipment
3. Make ready classroom

### **INTRODUCTION:**

Emphasize to the students the importance of knowing each tool and its use. Relate to your students why we carry salvage kits and how they become so useful in carrying out salvage operations.

**PRESENTATION:**

*If time permits, have students handle equipment.*

1. Salvage Kits (IFSTA 104, Pgs. 18-19)
  - A. Display each kit available
    - (1) Describe and explain each tool
    - (2) Encourage discussion
2. Other Salvage Equipment (IFSTA 104, Pgs. 23-24)
  - A. Water Chutes
  - B. Carry-all
  - C. Floor-runner
  - D. Bags of sawdust
  - E. Portable pumps

**EVALUATION:**

At the conclusion of the session have each student explain the importance and use of salvage-kits and tools. (Assign each student a kit or tool.)

**TASK PERFORMANCE:**

Task No. 61



## FFI - 8E "HANDLING WATER RUN-OFF IN STRUCTURES"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:  
--Techniques of removing water from structures

Teach the following skills:

- Construction of a catch-all
- Construction of a water chute
- Splicing salvage covers

### INSTRUCTORS REFERENCES:

1. IFSTA Instructor's Guide Sheet 104, Lesson 8
2. IFSTA 104, Pgs. 69-78, 109
3. IFSTA 205, Pgs. 85-101 (Automatic Sprinkler Systems)

### INSTRUCTOR MATERIALS:

1. Salvage covers
2. Spare sprinkler heads
3. Sprinkler tongs, wedges, and wrenches

### DESCRIPTION OF DRILL:

This drill should emphasize the techniques of removing water run-off from structures, including water pump, stopping sprinkler heads, constructing catch-all, water chutes, and splicing salvage covers.

### DRILL SETTING:

This drill should be held in a large enough area to be used both as a classroom and a place to demonstrate and practice constructing the water chute, catch-all, and splicing salvage covers.

## **FFI - 8E "HANDLING WATER RUN-OFF IN STRUCTURES"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of techniques involved in removing water from structures and the skills to construct a catch-all, water chutes, and splice salvage covers.

### **COVERAGE:**

Removing water with chutes and catch-alls; splicing covers; removing water with pumps; using sprinkler tongs and wedges

### **MATERIALS:**

1. Salvage covers
2. Spare sprinkler heads
3. Sprinkler tongs, wedges, and wrenches
4. Garden hose
5. Pike poles (two)

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 104, Lesson 8
  - IFSTA 104, Pgs. 69-78, 109
  - IFSTA 205, Pgs. 85-101 (Automatic Sprinkler Systems)
2. Make ready materials listed above
3. Make ready an area suitable for working with covers, water, etc. (apparatus floor)

### **INTRODUCTION:**

Discuss the fact that excessive fire loss to structures is often due to unnecessary water damage. For this reason fire fighters must be capable of handling water run-off in structures quickly and efficiently. To become effective, the skills in this lesson are imperative.

**PRESENTATION:**

In each of the following, demonstrate the various techniques. Then have students perform the task.

1. Removing Water with Chutes (IFSTA 104, Pgs. 69-70)
  - A. Construction of a chute
  - B. Draining windows and doors
  - C. Applied to stairs and ladders
2. Removing Water with a Catch-All (IFSTA 104, Pgs. 70-72)
  - A. Construction of a catch-all
  - B. Utilize to catch water
3. Splicing Covers (IFSTA 104, Pgs. 73-75)
4. Removing Water with Pumps (IFSTA 104, Pgs. 76-77)
  - A. Familiarize students with pump(s)
  - B. Have students utilize pump(s) to remove water from a room or building
5. Using Sprinkler Tongs and Wedges (IFSTA 104, Pgs. 77-78)
  - A. Utilizing wedges
  - B. Utilizing tongs

**EVALUATION:**

Observation of students during the session

**TASK PERFORMANCE:**

Tasks No. 37, 38, 39

**FF1 - 8F "FIRE FIGHTING FUNCTIONS PRIOR TO RELEASING  
PREMISES TO THE OWNER"**

**TIME:**

2 hours

**OBJECTIVES:**

Develop a basic understanding of the following:

- Searching for hidden fires
- Rendering structure safe
- Restoring the premises

**INSTRUCTOR REFERENCES:**

1. IFSTA Instructor's Guide Sheet 104, Lesson 12
2. IFSTA 104, Pgs. 103-108

**SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:**

1. NFPA-604, Appendix A-2312-4306 (Fire Department Actions and Responsibilities)  
604-410 (Action Following Emergency)  
604-4103 (Primary Responsibility Rests with Owner)  
604-430 (The Fire Department's Post-Emergency Salvage Operations)

**DESCRIPTION OF DRILL:**

The drill should emphasize firefighter functions to render the structure safe; protect property; search for hidden fires; and removing debris prior to releasing the premises to the owner.

**DRILL SETTING:**

This drill should be held in the classroom. If time permits, practice sessions could be held to gain proficiency in the practical skills required of this session.

## **'FFI - 8F "FIRE FIGHTING FUNCTIONS PRIOR TO RELEASING PREMISES TO THE OWNER"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of searching for hidden fires, rendering a structure safe, and restoring the premises.

### **COVERAGE:**

Searching for and extinguishing hidden fires; removing debris from buildings; restoring premises

### **MATERIALS:**

Chalkboard, chalk

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 104, Lesson 12
  - IFSTA 104, Pgs. 103-108
2. Make ready classroom

### **INTRODUCTION:**

Emphasize to your students the importance of follow-up search and extinguishment. (An experience where you encountered a re-kindle might be worth sharing with your students.) Discuss the necessity to render the structure safe and to restore premises, emphasizing public relations and the legal aspects.

### **PRESENTATION:**

1. Searching for Hidden Fires (IFSTA 104, Pgs. 103-105)
  - A. Concealed spaces, a systematic check
  - B. Under debris and around merchandise
  - C. Have students list other potential fire areas
2. Extinguishing Hidden Fires (IFSTA 104, Pgs. 105-106)
  - A. Emphasize need for protective clothing - *MOST FIRE-FIGHTING INJURIES OCCUR DURING OVERHAUL OPERATIONS*
  - B. Charged hose lines
  - C. Use water sparingly
  - D. Wetting agents

3. Removal of debris from Buildings (IFSTA 104, Pg. 106)
  - A. Use portable carriers
  - B. Pile in conspicuous place for future examination
  - C. Mop and squeegee floors
  - D. Do not remove debris if that area is under investigation
4. Restoring Premises (IFSTA 104, Pg. 108)
  - A. Making building safe
  - B. Covering roofs, doors, windows
  - C. Make contents safe

EVALUATION:

Observation of students during session.

TASK PERFORMANCE:

Task No. 34

## FFI - 8G "RELEASING PREMISES TO OWNER"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Restoring sprinkler systems
- Restoring standpipe systems
- Making area and contents safe

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 104, Lesson 13
2. IFSTA 104, Pgs. 108-120
3. IFSTA 302, Pg. 29 (Automatic Sprinkler Systems)
4. IFSTA 205, Pgs. 103-109 (Standpipe Systems)
5. IFSTA 302, Pg. 30 (Standpipe Systems)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

NFPA 604-430 (The Fire Department's Post Emergency Salvage Operations)

### DESCRIPTION OF DRILL:

This drill should emphasize the final phase of overhaul; making contents and area safe; restoring sprinkler and standpipe systems; and releasing the premises.

### DRILL SETTING:

This drill should be held in the classroom. The use of visual aids could be helpful to depict key points of this topic. If time permits, practice sessions could be held to gain proficiency in the practical skills required of this session.

## **FFI - 8G "RELEASNG PREMISES TO OWNER"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding for restoring standpipe systems, and making an area and its contents safe.

### **COVERAGE:**

The final phase of overhaul - "touching-up"; making areas and contents safe; restoring systems; properly releasing premises

### **MATERIALS:**

1. Handout "Releasing Premises" (IFSTA 104, Pg. 112)
2. Chalkboard, chalk

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 104, Lesson 13
  - IFSTA 104, Pgs. 108-112
2. Make ready handout
3. Make ready classroom

### **INTRODUCTION:**

Emphasize to your students the importance of properly releasing premises, illustrating the value to your public relations program, and the possible legal implications that could be involved.,

### **PRESENTATION:**

1. Restoring Sprinkler Systems
  - A. Contact persons responsible
  - B. Watch premises
2. Restoring Standpipe Systems
  - A. Drain system
  - B. Close all valves
  - C. Restore outlet caps



3. Making Contents Safe
  - A. Water absorbed in contents
  - B. Weight conditions
  - C. Overhead hazards
    - (1) Fixtures
    - (2) Suspended debris
    - (3) Shelving, etc.
4. Placing Contents in Proper Order
  - A. Owner or occupant should be present
  - B. Place in same order as before fire
5. Making Area Safe
  - A. Direct and recommend removal of hazards
  - B. Post guards as necessary
6. Deodorizing Problems
  - A. Counteracting chemicals
  - B. The longer odors are present, the more difficult they are to remove
  - C. Deodorizing Principles
    - (1) Apply deodorizing fog as soon as possible
    - (2) Remove odor-generating materials
    - (3) Apply fog at rate of one-minute per 1,000 square feet
    - (4) Seal enclosure and allow vapor to work at rate of two-minutes per 2,000 square feet
    - (5) Open enclosure and ventilate with a 24-inch exhaust fan (minimum) and cross ventilate two-minutes per 1,000 square feet.
    - (6) If odor still prevails, repeat process
7. Releasing Premises
  - A. The owner and occupants
    - (1) Advise about conditions
    - (2) Recommend necessary precautions
  - B. Utilities
    - (1) Give full cooperation
    - (2) Recommend necessary precautions
  - C. Other authorities
    - (1) Cooperate with law enforcement representatives
    - (2) Cooperate with city officials
    - (3) Notify proper authorities of suspicious fires

**EVALUATION:**

Have students state procedures and fire department responsibility, as related to the tasks covered in this session.

**TASK PERFORMANCE:**

Task No. 61

### **FFI - 9 FIRE STREAMS**

<b>FFI - 9A</b>	<b>Introduction to Fire Streams and Water as an Extinguishing Agent</b>	<b>2 hours</b>
<b>FFI - 9B</b>	<b>Fire Stream Requirements and Principles of Pressure</b>	<b>2 hours</b>
<b>FFI - 9C</b>	<b>Characteristics of Fire Streams; Nozzle Pressure and Water Flow</b>	<b>2 hours</b>
<b>FFI - 9D</b>	<b>Calculating Fire Streams - Formulas and Rule of Thumb</b>	<b>2 hours</b>
<b>FFI - 9E</b>	<b>Calculating Master Streams</b>	<b>2 hours</b>
<b>FFI - 9F</b>	<b>Relay of Water - Supplying Private Systems</b>	<b>2 hours</b>
<b>FFI - 9G</b>	<b>Selecting Fire Streams - Design and Construction of Fire Stream Nozzles</b>	<b>2 hours</b>
<b>FFI - 9H</b>	<b>Water Flow Tests</b>	<b>2 hours</b>
<b>FFI - 9I</b>	<b>Water Application</b>	<b>2 hours</b>
<b>FFI - 9J</b>	<b>Development and Application of Foam</b>	<b>2 hours</b>
<b>TOTAL</b>		<b>20 hours</b>

## FFI - 9A "INTRODUCTION TO FIRE STREAMS AND WATER AS AN EXTINGUISHING AGENT"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Background and development of hose streams
- Purpose of fire streams
- Properties of water
- Effectiveness of water as an extinguishing agent

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 105, Lessons 1 and 2
2. IFSTA 105, Pgs. 3-19
3. IFSTA 107, Pgs. 37-41 (Law of Specific Heat and Law of Latent Heat of Vaporization)
4. IFSTA 107, Pg. 33 (Law of Heat Flow)
5. IFSTA 107, Pg. 106 (Application of Water Fog as an Aid to Ventilation)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

Fire Protection Handbook - 14th edition, 11-61 (Hydraulic Properties of Water)

### INSTRUCTOR MATERIALS:

1. Visual aids
2. Chalkboard, chalk

### DESCRIPTION OF DRILL:

This drill should emphasize the history and development of the hose stream; purpose of fire streams; the physical properties and the effectiveness of water as an extinguishing agent; its advantages and disadvantages.

### DRILL SETTING:

This drill should be held in the classroom. Visual aids should be used to depict key points in this topic. An instructor with a physical science background would be beneficial for this topic.

## **FFI - 9A "INTRODUCTION TO FIRE STREAMS AND WATER AS AN EXTINGUISHING AGENT"**

### **TIME:**

**2 hours**

### **OBJECTIVES:**

**To provide the student with a basic understanding of background, development, and purpose of fire streams and water as an extinguishing agent.**

### **COVERAGE:**

**Definition; purpose and scope; characteristics of water; heat transfer and heat absorption; expansion of water when converted to steam; other extinguishing advantages of water; disadvantages of water as an extinguishing agent**

### **MATERIALS:**

- 1. Chalkboard, chalk**
- 2. Visual aids**

### **PREPARATION:**

- 1. Review the following material as you feel necessary:**
  - IFSTA Instructor's Guide Sheet 105, Lessons 1 and 2**
  - IFSTA 105, Pgs. 3-19**
  - IFSTA 107, Pgs. 37-41 (Law of Specific Heat and Law of Latent Heat of Vaporization)**
  - IFSTA 107, Pg. 33 (Law of Heat Flow)**
  - IFSTA 107, Pg. 106 -108 (Application of Water Fog as an Aid to Ventilation)**
- 2. Prepare classroom and visual aids**

### **INTRODUCTION:**

**Emphasize to your students the importance of knowing what happens when water is applied to a fire with reference to proper fire stream selection.**

**PRESENTATION:**

Use blackboard or visual aids to discuss the following:

1. Fire Streams
  - A. Influenced by
    - (1) velocity, gravity
    - (2) wind
    - (3) gravity
    - (4) friction with air
  - B. Condition of Stream Influenced by
    - (1) operating pressures
    - (2) nozzle design
    - (3) nozzle adjustment
    - (4) condition of nozzle orifice
2. Purpose of Fire Streams
  - A. Reduce temperature
  - B. Provide protection
3. Characteristics of Water
  - A. Formed of hydrogen and water
  - B. Below 32° F. and 0° C., converts to solid (ice)
  - C. Above 212° F. converts into gas (water vapor, or steam)
  - D. Weight
    - (1) most at freezing (approx. 62.4 lbs./cu. ft.)
    - (2) least at boiling (approx. 60 lbs./cu. ft.)
4. Heat Transfer and Absorption
  - A. The law of heat flow
  - B. The law of specific heat
  - C. The law of latent heat of vaporization
5. Expansion of Water When Converted to Steam
  - A. Approx. 1,700 times original volume at boiling (212° F.)
  - B. Greater the heat, greater the expansion
6. Advantages of Water as Extinguishing Agent
  - A. Greater heat absorbing capacity than other agents
  - B. Large amount of heat required to change water into steam
  - C. Greater surface area of water exposed, more rapidly heat will be exposed.
  - D. Water converted to steam occupies many times original volume
7. Disadvantages of Water as an Extinguishing Agent
  - A. Surface tension limits soaking ability
  - B. Reacts violently with certain materials or chemicals
  - C. Low opacity of water fog allows radiated heat to pass through
  - D. Freezing can be hazardous to firefighters and equipment
  - E. Low viscosity allows to run off surfaces quickly
  - F. A conductor of electricity, dangerous to the firefighter
8. The Application of Water Fog
  - A. Direct fog application
    - (1) directly to seat of small free-burning fire
    - (2) quenches and cools
  - B. Indirect fog application
    - (1) to overhead areas of extremely hot or advanced fire
    - (2) creates large volume of steam
  - C. Combination fog application
    - (1) spiral motion of nozzle
    - (2) reduces water damage

**EVALUATION:**

Through means of oral or written examination, students should know main points of the lesson.

**TASK PERFORMANCE:**

Task No. 40

## **FFI - 9B "FIRE STREAM REQUIREMENTS AND PRINCIPLES OF PRESSURE"**

### **TIME:**

2 hours

### **OBJECTIVES:**

Develop a basic understanding of the following:

- Requirements for extinguishing structural fires
- Requirements for extinguishing flammable liquid fires
- Requirements for extinguishing fires involving electrical equipment
- Requirements for extinguishing fires involving combustible metals
- Principles of pressure

### **INSTRUCTOR REFERENCES:**

1. IFSTA Instructor's Guide Sheet 105, Lessons 3 and 4
2. IFSTA 105, Pgs. 20-36
3. IFSTA 101, Pg. 131 (Forcible Entry - Requirements for Burning)
4. IFSTA 402, Pgs. 36-38 (How Pressure Acts on Liquids)
5. IFSTA 402, Pg. 38 (Static Pressure)
6. IFSTA 402, Pg. 39 (Normal Operating Pressure)
7. IFSTA 402, Pg. 39 (Residual Pressure)
8. IFSTA 402, Pg. 40 (Flow Pressure)
9. IFSTA 402, Pgs. 35, 36 (Determining Pounds Per Square Inch)
10. IFSTA 402, Pgs. 41-48 (Resistance to Flow of Liquids)
11. IFSTA 402, Pg. 48 (Back Pressure and Water Hammer)
12. IFSTA 401, Pg. 32, Problem 18
13. IFSTA 401, Pg. 46, Problem 4

### **SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:**

Fire Protection Handbook - 14th edition, 9-67 (Hose Streams and Nozzles)

### **INSTRUCTOR MATERIALS:**

1. Visual aids
2. Chalkboard, chalk

### **DESCRIPTION OF DRILL:**

This drill should emphasize fire stream requirements for extinguishing structural fires; flammable liquid fires; fires involving energized electrical equipment; fires involving combustible metals; and all aspects of how pressure acts on fluids.

**DRILL SETTING:**

This drill should be held in the classroom. Visual aids should be used to depict key points of this topic. An instructor with a physical science background would be beneficial for this topic.



## **FFI - 9B "FIRE STREAM REQUIREMENTS AND PRINCIPLES OF PRESSURE"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of extinguishing requirements for structural fires, flammable liquid fires, electrical equipment fires, flammable metallic fires, and the principles of pressure.

### **COVERAGE:**

Requirements for extinguishing structural fires; flammable liquid fires; electrical equipment fires; flammable metallic fires; how PSI is determined; how pressures act on fluids; kinds of pressure on fluids; atmospheric pressure; pressure loss or gain because of elevation; water hammer; pressure or friction loss

### **MATERIALS:**

1. Chalkboard, chalk
2. Visual aids

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 105, Lessons 3 and 4
  - IFSTA 105, Pgs. 20-36
  - IFSTA 101, Pg. 131 (Forcible Entry - Requirements for Burning)
  - IFSTA 402, Pgs. 36-38 (How Pressure Acts on Liquids)
  - IFSTA 402, Pg. 38 (Static Pressure)
  - IFSTA 402, Pg. 39 (Normal Operating Pressure)
  - IFSTA 402, Pg. 39 (Residual Pressure)
  - IFSTA 402, Pg. 40 (Flow Pressure)
  - IFSTA 402, Pgs. 35, 36 (Determining Pounds Per Square Inch)
  - IFSTA 402, Pgs. 41-48 (Resistance to Flow of Liquids)
  - IFSTA 402, Pg. 48 (Back Pressure and Water Hammer)
  - IFSTA 401, Pg. 32, Problem 18
  - IFSTA 401, Pg. 46, Problem 4
2. Prepare classroom and materials

### **INTRODUCTION:**

Emphasize the importance of knowing fire stream requirements for different classes of fire with reference to proper extinguishing effects. Cite personal experiences.

**PRESENTATION:**

Explain and discuss important points on the following:

1. Requirements for Extinguishing Structural Fires
  - A. Confined fires
    - (1) Incipient phase - direct application of water
    - (2) Flame-producing phase - combination of direct and indirect application of water
    - (3) Smoldering phase - indirect application of water
  - B. Open or non-confined fires
    - (1) Long-range operations
    - (2) Large volumes of water
2. Requirements for Extinguishing Flammable Liquid Fires
  - A. Flash points of flammable liquids
  - B. Difficulty of reducing temperatures with water fog
  - C. Danger of reignition
3. Requirements for Extinguishing Electrical Equipment Fires and Conductivity of Fire Streams
  - A. Danger to operator of water stream (hose or extinguisher)
  - B. Water damaging to electrical equipment
  - C. Safe use of fire streams
    - (1) fog nozzles
    - (2) intermittent applications of water (broken streams)
    - (3) safe distances
4. Requirements for Extinguishing Combustible Metal Fires
  - A. Intensity of fire increased by water application
  - B. Some fires may be extinguished by heavy, coarse streams over long periods
5. Principles of Pressure - How PSI's are Determined
  - A. Expressed in pounds per square foot (psf) or pounds per square inch (psi)
  - B. Weight of cubic foot of water approximately 62.5 pounds at sea level
  - C. One square inch column of water one foot high exerts pressure of .434 psi at the base
6. How Pressures Act on Fluids - Six Principles
  - A. Fluid pressure is perpendicular to any surface on which it acts.
  - B. Fluid pressure at a point in a fluid at rest is of the same intensity in all directions.
  - C. Pressure applied to a confined fluid from without is transmitted equally in all directions.
  - D. The pressure of a liquid in an open vessel is proportional to its depth.
  - E. The pressure of a liquid in an open vessel is proportional to the density of the liquid.
  - F. The pressure of a liquid on the bottom of a vessel is independent of the shape of the vessel.
7. Kinds of Pressure on Fluids
  - A. Absolute and gauge pressure
    - (1) absolute: total lack of pressure, or perfect vacuum
    - (2) gauge: pressure relative to atmospheric pressure (14.7 lbs.)

- B. Static pressure - stored potential energy available to force water through pipe, fittings, fire hose, and adapters.
  - C. Normal operating pressure - that pressure normally found on a water distribution system during normal consumption demands.
  - D. Residual pressure - that part of the total available pressure that is not used to overcome friction or gravity while forcing water through pipe, fittings, fire hose, and adapters.
  - E. Flow pressure - the forward velocity pressure at a discharge opening while water is flowing.
8. Atmospheric pressure
- A. A pressure exerted on everything by the environment enveloping the earth's surface
  - B. Atmospheric pressure at sea level used as a mean or standard -14.7 psi
9. Pressure Loss or Gain Because of Elevation
- A. Nozzle pressure will be less than engine pump pressure when the nozzle is above the pump in elevation
    - (1) approximately 5 psi additional pressure required to raise water in a hose one story (11.5 feet)
    - (2) approximately 11.5 feet vertical drop in elevation will result in 5 psi greater pressure
10. Water Hammer
- A. Surge created when flow of water through hose or pipe is suddenly stopped
  - B. Stoppage causes change in direction of energy multiplied many times
  - C. Can cause damage to water mains, plumbing, hose, pumps
  - D. Force can cause injury to firefighters
  - E. Avoided by slow closing of all valves, nozzles, hydrants, hose clamps, etc.
11. Pressure or Friction Loss
- A. That part of total pressure used to overcome friction while forcing water through pipes, fittings, hose and adapters.
  - B. Principles:
    - (1) All other conditions being the same, loss by friction varies directly with the length of the hose or pipe.
    - (2) When the same size hose is used, the friction loss will vary approximately with the square of the velocity of the flow.
    - (3) For the same discharge, friction loss varies inversely as the fifth power of the diameter of the hose.
    - (4) For a given velocity of flow, the friction loss in hose is approximately the same no matter what the pressure on the water may be.

### EVALUATION:

Through the use of oral or written examination, students should demonstrate their understanding of the basic principles covered.

### TASK PERFORMANCE:

Task No. 41

157

**FFI - 9C "CHARACTERISTICS OF FIRE STREAMS;  
NOZZLE PRESSURE AND WATER FLOW"**

**TIME:**

2 hours

**OBJECTIVES:**

Develop a basic understanding of the following:

- Influencing factors in producing fire streams
- Different types and characteristics of fire streams
- Desired and adequate nozzle pressure

**INSTRUCTOR REFERENCES:**

1. IFSTA Instructor's Guide Sheet 105, Lessons 5 and 6
2. IFSTA 105, Pgs. 37-67
3. IFSTA 107, Pg. 106-108 (Application of Water Fog as an Aid to Ventilation)
4. IFSTA 103, Pg. 123 (Master Stream Appliances)
5. IFSTA 401, Pgs. 91-98 (Formula)
6. IFSTA 401, Pgs. 93-95 (Computing GPM)

**INSTRUCTOR MATERIALS:**

1. Visual aids
2. Chalkboard, chalk
3. Film "Coordinated Fire Attack"

**MATERIALS, EQUIPMENT:**

1. Various nozzles (straight stream and fog)
2. Master stream
3. Master stream appliances

**DESCRIPTION OF DRILL:**

This drill should emphasize the influencing factors in producing good fire streams; different types and characteristics of hose streams; and calculating water flow for adequate nozzle pressure.

**DRILL SETTING:**

This drill should be held in the classroom. Various types of nozzles, both straight stream and fog (2 1/2-inch and 1 1/2-inch) and a master stream with various tips and appliances should be available for examination and discussion on design and use. The film "Coordinated Fire Attack" is recommended.

**FFI - 9C "CHARACTERISTICS OF FIRE STREAMS;  
NOZZLE PRESSURE AND WATER FLOW"**

**TIME:**

2 hours

**OBJECTIVES:**

To provide the student with a basic understanding of the influencing factors in producing fire streams, different types and characteristics of fire streams, and desired and adequate nozzle pressure.

**COVERAGE:**

Influencing factors; types of fire streams; characteristics of broken fire streams; fog or spray nozzle design and pressure; velocity of the jet; size of water particles; volume of water discharge; reach of fog stream, space occupied by fog stream; handling, performance, and results of fog streams; solid stream nozzles; flow capacity of solid streams; effective reach of a solid stream; master streams; special stream nozzles; desired and adequate nozzle pressure; formula symbols; square root of numbers; constants, and some valuable formulas; computing water flow in GPM; constant gallonage nozzles

**MATERIALS:**

1. Display of various nozzles in the department
2. Chalkboard, chalk
3. Visual aids
4. Film "Co-ordinated Fire Attack"
5. Projector, screen

**PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 105, Lessons 5 and 6
  - IFSTA 105, Pgs. 37-67
  - IFSTA 107, Pgs. 106-108 (Application of Water Fog as an Aid to Ventilation)
  - IFSTA 103, Pg. 123 (Master Stream Appliances)
  - IFSTA 401, Pgs. 91-98 (Formula)
  - IFSTA 401, Pgs. 93-95 (Computing GPM)
2. Prepare classroom and materials



## INTRODUCTION:

Emphasize to your students the importance of understanding the characteristics of fire streams and how to produce them.

## PRESENTATION:

1. Influencing Factors
  - A. Available water
  - B. Fire Equipment
    - (1) water supply - hydrant, pumper, reservoir, etc.
    - (2) fire hose
    - (3) nozzle
  - C. Fire Apparatus
  - D. Human Ability
    - (1) human error
    - (2) communications
2. Types of Fire Streams
  - A. Broken streams
  - B. Fog or spray streams
  - C. Solid streams
  - D. Show film "Coordinated Fire Attack"
  - E. Discuss each type of fire stream
  - F. Show department nozzles that produce each type of stream
3. Characteristics of Broken Fire Streams
  - A. Solid stream broken into coarsely divided drops
  - B. Commonly used for protecting exposures
  - C. Water curtain
4. Fog or Spray Nozzle Design - Velocity of the Jet
  - A. Operates at its best when pressure is enough
  - B. Inefficient if pressure too low
  - C. Nozzle design or adjustment affects the fog stream
    - (1) reach or forward velocity of stream
    - (2) angle of discharge
    - (3) discharge pattern should remain the same - uniform - no matter what the setting
5. Size of the Water Particles - Volume of Water Discharge
  - A. Finely divided (as a mist) may be carried away by air currents
  - B. Friction loss (with air) of particles decrease the forward velocity of a fog stream
  - C. Fog streams must deliver enough volume of water to absorb heat more rapidly than generated
6. Reach of Fog Stream - Space Occupied by Fog Stream
  - A. Not as great as that of solid stream
  - B. Requires greater velocity at nozzle
  - C. Distance to be reached at a fire requires that the fog pattern be different
  - D. Amount of heat to be absorbed determines type of nozzle setting to be used

7. Handling, Performances, and Results of Fog Streams
  - A. Solid streams more difficult to handle at nozzle
    - (1) straight stream away from nozzle causes equal pressure in opposite direction, directly
  - B. Desired performance of fog nozzles depends upon
    - (1) quality of the fog stream
    - (2) reach of the fog stream
    - (3) space occupied by fog stream
    - (4) ease of handling of fog stream
8. Solid Stream Nozzles - Flow Capacity of Solid Streams
  - A. Physical characteristics of "good" stream
    - (1) at point of breakover has not broken into spray
    - (2) most of volume will shoot inside a 10" circle
    - (3) stiff enough to reach height required with breeze blowing
  - B. Flow capacity determined by
    - (1) velocity of stream
    - (2) size of discharge opening
    - (3) basic rule - nozzle tip should not be larger than one-half the diameter of the hose
9. Effective Reach of a Solid Stream
  - A. Characteristics
    - (1) the greater the stream velocity at the nozzle, the greater the reach of the stream
    - (2) the greater the volume of water with the same stream velocity, the greater the reach of the stream
    - (3) the closer the directed stream reaches 32° angle to the earth's surface, the greater the reach of the stream (rule of thumb: 45°)
10. Master Streams - Special Stream Nozzles
  - A. Types of master streams (any stream too large to be controlled without mechanical aid)
    - (1) turret pipe
    - (2) deluge set
    - (3) monitor
    - (4) ladder pipe
  - B. Show department master stream devices
  - C. Types of special stream nozzles (those designed to be used in special situations or for special purposes)
  - D. Show department special stream nozzles
11. Nozzle Pressure and Water Flow
  - A. Production of good fire streams by using formulas, rules of thumb, and prepared tables or charts
    - (1) computing water flow (gpm)
    - (2) gpm flows from fog nozzles
    - (3) constant gallonage nozzles

### EVALUATION:

Through oral or written examination, students should understand principles covered in this lesson.

### TASK PERFORMANCE:

Task No. 42

171

## FFI - 9D "CALCULATING FIRE STREAMS - FORMULAS AND RULE OF THUMB"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Principles of fire stream calculations
- Make fire stream calculations using rule of thumb

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 105, Lessons 7 and 8
2. IFSTA 105, Pgs. 68-103

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

Fire Protection Handbook - 14th edition  
9-67 (Friction Loss Flow Formulas)  
9-67 (Friction Loss Calculations)  
9-67 (Fire Hose Calculations)

### INSTRUCTOR MATERIALS:

1. Handout covering formulas, problems, and rule of thumb
2. Chalkboard, chalk
3. Department pump chart (if available)

### DESCRIPTION OF DRILL:

This drill should emphasize the calculating of effective hose streams using both the formula method and the rule of thumb.

### DRILL SETTING:

This drill should be held in the classroom. Students should be given handouts covering the material being presented plus some problems to solve. This topic is very important especially for current or soon-to-be pump operators. A department pump chart could be developed if the department does not have one.



## **FFI - 9D "CALCULATING FIRE STREAMS - FORMULAS AND RULE OF THUMB"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of the principles of fire stream calculations and to teach the student to make fire stream calculations using rule of thumb.

### **COVERAGE:**

Computing friction loss in 2 1/2-inch hose; computing friction loss in hose other than 2 1/2-inch; supplying more than one hose line; wyed 1 1/2-inch lines and pre-connected hose; siamesed hose lines; friction loss calculation

### **MATERIALS:**

1. Handouts covering formulas, problems, and rule of thumb
2. Chalkboard, chalk
3. Department pump chart (if available)

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 105, Lessons 7 and 8
  - IFSTA 105, Pgs. 68-103
2. Prepare classroom and materials

### **INTRODUCTION:**

Emphasize to your students the importance of accurate formula calculations for obtaining proper fire streams and the practicality of rule of thumb calculations with reference to fire ground operations.

### **PRESENTATION:**

In covering the topics below, utilize handouts with listed examples to explain principles to students. Then have students work out examples in the handouts.

1. Computing Friction Loss in 2 1/2-inch Hose (IFSTA 105, Pgs. 69-72)
2. Computing Friction Loss in Hose Other Than 2 1/2-inch (IFSTA 105, Pgs. 72-74)
3. Supplying More Than One Hose Line (IFSTA 105, Pgs. 74-77)
4. Wyeed 1 1/2-inch and Pre-connected Hose (IFSTA 105, Pgs. 78-85)
5. Siamesed Hose Lines (IFSTA 105, Pgs. 85-89)
6. Calculating Friction Loss by Condensed "Q" Formula (IFSTA 105, Pgs. 90-91)
7. Calculating Friction Loss by Association, Fractions, GPM Flow, and Counting (IFSTA 105, Pgs. 91-96) - Encourage student feedback
8. Applying Rule of Thumb (IFSTA 105, Pgs. 96-103)
  - A. Have students work out problems on chalkboard to develop selected method
  - B. Use examples listed

**EVALUATION:**

1. Through the use of oral or written examination, students should understand the basic principles covered.
2. Follow up with other sessions to gain efficiency.

## FFI - 9E "CALCULATING MASTER STREAMS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Definition of master stream
- Calculating master streams
- Producing master streams

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 105, Lesson 9
2. IFSTA 105, Pgs. 104-115

### INSTRUCTOR MATERIALS:

1. Handout covering formulas and problems
2. Chalk, chalkboard
3. Department pump chart (if available)

### DESCRIPTION OF DRILL:

This drill should emphasize the calculating and producing of effective master streams.

### DRILL SETTING:

This drill should be held in the classroom. Students should be given handouts covering the material being presented plus some problems to solve. The class should start by reviewing drill FFI - 9D.

## **FFI - 9E "CALCULATING MASTER STREAMS"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of calculating and producing master streams.

### **COVERAGE:**

Flows which warrant master streams; advantages of large diameter hose

### **MATERIALS:**

1. Handouts covering formulas and problems
2. Chalkboard, chalk
3. Department pump chart (if available)
4. Visual aids

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 105, Lesson 9
  - IFSTA 105, Pgs. 104-115
2. Prepare classroom and materials

### **INTRODUCTION:**

Define "master streams" and how they are used in the department.

### **PRESENTATION:**

1. Review Lesson FFI-9D
  - A. Use chalkboard to cover important areas
  - B. Have students work out examples
2. Flows Which Warrant Master Streams (IFSTA 105, Pgs. 104-111)
  - A. Utilize handouts with listed examples to explain principles to students
  - B. Have students work out examples in handouts
3. Advantages of Large Diameter Fire Hose (IFSTA 105, Pgs. 111-115)
  - A. Use overheads of listed graphs to explain principles
  - B. Use any remaining time to cover weak areas

**EVALUATION:**

Though the use of oral or written examination, students should understand the basic principles covered.

## FFI - 9F "RELAY OF WATER - SUPPLYING PRIVATE SYSTEMS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Need for relay pumping
- Ability to do relay pumping
- Spacing pumpers (formula and rule of thumb)
- Supply automatic sprinkler systems
- Supply standpipes

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 105, Lessons 10 and 11
2. IFSTA 105, Pgs. 116-128
3. IFSTA 205, Sec. 3 (Supplying Sprinkler and Standpipe Systems)
4. IFSTA 205, Pgs. 85-101 (Automatic Sprinkler Systems)
5. IFSTA 205, Pgs. 103-111 (Standpipe Systems)

### INSTRUCTOR MATERIALS:

1. Handout covering formulas and problems
2. Chalk, chalkboard
3. Department pump chart (if available)

### DESCRIPTION OF DRILL:

This drill should emphasize importance of, need for, and calculating of relay pumping and the fire department's responsibility in properly using and supplying private protection systems (sprinkler systems and standpipes).

### DRILL SETTING:

This drill should be held in the classroom. The students should be given handouts covering the material plus problems to solve.

## FFI - 9F "RELAY OF WATER - SUPPLYING PRIVATE SYSTEMS"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of relay pumping and pumping to private fire protection systems.

### COVERAGE:

Factors controlling pumper relay; relay relief valves; spacing pumps; start and stop operations during relay; supplying automatic sprinkler systems; feeding standpipe systems; pump chart

### MATERIALS:

1. Handout covering formulas and problems
2. Chalkboard, chalk
3. Department pump chart (if available)

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 105, Lessons 10 and 11
  - IFSTA 105, Pgs. 116-128
  - IFSTA 205, Sec. 3 (Supplying Sprinkler and Standpipe Systems)
  - IFSTA 205, Pgs. 85-101 (Automatic Sprinkler Systems)
  - IFSTA 205, Pgs. 103-111 (Standpipe Systems)
2. Prepare classroom and materials

### INTRODUCTION:

Emphasize to the students that even if relay operations are not common, they will benefit from the knowledge obtained in the event they are called upon to participate in a relay operation. Cite examples of local fire protection systems and how they benefit initial attack.

### PRESENTATION:

Use handout with listed examples (if appropriate) to explain the following principles. Then have students work out the problems.



1. **Factors Controlling Pumper Relay**
  - A. Pumps should usually not operate above 200 psi discharge pressure.
  - B. Each pump operator must know amount of water flowing.
  - C. All pumps should operate at approximately same pressure.
  - D. Open and shut nozzles slowly.
  - E. When starting operation, open pump drain cocks or unused discharge opening
  - F. Place largest pumper at water source and smallest pumper at fire.
2. **Relay Relief Valves**
  - A. Set to protect men, pump and hose
  - B. Ordinary pressure relief valve does not protect intake side of relay pump
  - C. If no relay relief valve available, pump operator must be prepared to relieve pressure through unused discharge valve.
3. **Spacing Pumps (Use formulas from IFSTA 105, pgs. 119-122)**
4. **Start and Stop Operations During Relay**
  - A. Starting - major problem removing air in supply lines of each pump
  - B. Shutdown - more serious because of cavitation problems if source of water suddenly shut off
  - C. General guidelines for Start and Stop Operations - (IFSTA 105, pgs. 122-123)
5. **Supplying Automatic Sprinkler Systems**
  - A. **Essential Items**
    - (1) pumper must be adequate for volume and pressure
    - (2) two hose lines from pumper to fire department connection
    - (3) build up pressure slowly to 150 psi
    - (4) if one pumper is not enough, use two pumps
    - (5) do not rob water supply feeding system
    - (6) check all control valves to system
    - (7) avoid shutting off sprinkler system too soon
    - (8) maintain pumper hookup during overhaul
    - (9) see that system is restored
  - B. Examples of such systems locally
6. **Feeding Standpipe Systems**
  - A. **Requirements**
    - (1) feed through parallel hose lines from pumper
    - (2) allow 25 psi loss for system itself
    - (3) allow 5 psi loss for each floor
    - (4) friction loss per 100 feet of hose must be calculated on both supply lines and working hose on floors
  - B. Examples of such systems locally
7. **Pump Chart**
  - A. Development of pump chart useful to particular department having jurisdiction
  - B. Have students develop basic pump chart on chalkboard

#### EVALUATION:

1. Through use of oral or written examination, students should understand the basic principles covered in this lesson.
2. Follow up with other sessions to gain proficiency.



# FFI - 9G "SELECTING FIRE STREAMS - DESIGN AND CONSTRUCTION OF FIRE STREAM NOZZLES"

## TIME:

2 hours

## OBJECTIVES:

Develop a basic understanding of the following:

- Pre-fire planning
- Understanding fire streams
- Consideration in selecting fire streams
- Construction and design of fire stream nozzles
- Operating principles of fire stream nozzles

## INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 105, Lessons 12 and 14
2. IFSTA 105, Pgs. 131-135, 161-168
3. IFSTA 107, Pg. 82-84 (Extension Upward)
4. IFSTA 103, Pg. 45 (Fire Hose Nozzles)

## INSTRUCTOR MATERIALS:

1. Chalk, chalkboard
2. Visual aids
3. Film "The Nozzleman"

## MATERIALS, EQUIPMENT:

Various fog and solid stream nozzles (2 1/2-inch and 1 1/2-inch)

## DESCRIPTION OF DRILL:

The drill should emphasize the extent to which fire streams are involved in pre-fire planning; understanding the considerations and problems in selecting fire streams; principles of fog and solid stream nozzles; design and construction features.

## DRILL SETTING:

This drill should be held in the classroom. Visual aids should be used to depict key points of this topic. Various fog and straight stream nozzles should be available for examination and discussion. The film "The Nozzleman" is recommended.

# **FFI - 9G "SELECTING FIRE STREAMS - DESIGN AND CONSTRUCTION OF FIRE STREAM NOZZLES"**

## **TIME:**

2 hours

## **OBJECTIVES:**

To provide the students with a basic understanding of selecting fire streams; the construction and operating principles of fire stream nozzles.

## **COVERAGE:**

Pre-fire planning; considering the fire; streams to protect exposures; streams at avenues of fire spread; streams at point of origin; mechanical principles of spray stream nozzles; the periphery deflected stream; the impinging deflected stream; mechanical principles of solid stream nozzles; rotary motion and twisting currents at the nozzle; fire stream control valves.

## **MATERIALS:**

1. Chalkboard, chalk
2. Visual aids
3. Film "The Nozzlemán"
4. Various fog and solid stream nozzles
5. Projector, screen

## **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 105, Lessons 12 and 14
  - IFSTA 105, Pgs. 131-135, 161-168
  - IFSTA 107, Pgs. 82-84 (Extension Upward - Downward)
  - IFSTA 103, Pg. 45 (Fire Hose Nozzles)
2. Prepare classroom and materials

## **INTRODUCTION:**

Emphasize to your students the importance of properly selecting the fire stream best suited for the job and how pre-fire plans affect the selection. Cite the importance of nozzle design and construction with reference to good fire stream development.

**PRESENTATION:**

1. Pre-fire planning
  - A. Relationship of pre-fire planning and fire streams
  - B. Selecting nozzles and streams
2. Considering the Fire
  - A. Situation in which fire is found governs
    - (1) types of fire streams
    - (2) positions for attack
  - B. Three-position approach for firefighting
    - (1) at exposures
    - (2) at avenues of fire spread
    - (3) at point of origin
  - C. Application of fire streams
    - (1) standard operating procedures recommended
    - (2) immediate attack nozzles selected in advance
  - D. Show film "The Nozzleman"
  - E. Discuss important points with students
3. Streams to protect Exposures
  - A. Small buildings - small hose lines
  - B. Larger buildings - large hand streams or master streams, water curtains
  - C. Possible interior attack if fire penetrates exposed buildings
4. Streams at Avenues of Fire Spread
  - A. Methods of fire spread - conduction, convection, radiation, direct flame contact
  - B. Extension - vertical, horizontal, downward
  - C. Fire streams selected by consideration of direction and methods of spread of fire
5. Streams at Point of Origin
  - A. Concentrated attack at point of origin should be made (place of most intense burning)
  - B. Sometimes exposures and avenues of fire spread must be considered before point of origin
  - C. Rule of thumb for flow rate necessary in enclosed building.
    - (1) one gpm. for each 100 cubic feet of enclosed space
    - (2) flow must be adequate to reduce heat and heat production
  - D. When fire blacked out
    - (1) total flow must be stopped
    - (2) short applications with straight streams for overhaul
6. Mechanical Principles of Spray Stream Nozzles
  - A. Define deflection - turning or state of being turned
  - B. Define periphery - line bounding a rounded surface, the outward bounds of a thing
  - C. Define impinge - to strike or dash upon or against, with force
  - D. Wide-angle deflection produces short-reach fog
  - E. Narrow-angle deflection produces long-reach fog
7. Deflected Stream Nozzles
  - A. Explain principles (IFSTA 105, pgs. 162-163)
  - B. Show examples of
    - (1) periphery deflected stream nozzle
    - (2) impinging deflected stream nozzle

8. Mechanical Principles of Solid Stream Nozzles
  - A. Shape of stream reduced in nozzle
  - B. Cylindrical bore rounds out, gives stream shape before discharge
  - C. Show basic design (IFSTA 105, pg. 164)
  - D. Show examples of nozzles which produce the stream
9. Rotary Motion and Twisting Currents at the Nozzle
  - A. Devices introduced to prevent motion and twisting
    - (1) internal vanes
    - (2) sometimes called "vanes and stream straighteners"
  - B. Master stream devices need something to reduce whirling action set up by converging streams
  - C. Control valves at nozzle (IFSTA 105, pgs. 166-168)
    - (1) solid-plug
    - (2) rotary
    - (3) ball-valve
  - D. Show examples of control valves in the department

EVALUATION:

Through the use of oral or written examination, students should understand basic principles covered in this lesson.

TASK PERFORMANCE:

Tasks No. 43, 44

## FFI - 9H "WATER FLOW TESTS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Computing available water
- Using flow test equipment

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 105, Lesson 15
2. IFSTA 105, Pgs. 169-179
3. IFSTA 107, Pgs. 25-30 (Phases of Burning)
4. IFSTA 205, Pg. 62 (Fire Flow Test)
5. IFSTA 205, Pgs. 73-79 (Water Flow Test Summary Sheet)
6. IFSTA 205, Pg. 70 (Using Pitot Tube and Gauge)
7. IFSTA 401, Pgs. 76-79 (Roots)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition  
11-53 (Set of Water Flow Testing Apparatus)  
11-53 (Pitot Tube Method of Measuring Flow)

### INSTRUCTOR MATERIALS:

1. Chalkboard, chalk
2. Handout covering formulas and problems

### MATERIALS, EQUIPMENT:

1. Pitot tube and guage

### DESCRIPTION OF DRILL:

This drill should emphasize calculating available water and using flow testing equipment.

DRILL SETTING:

This drill should have a short classroom session to explain the calculating formula and then some time should be spent for flow testing hydrants. Each student should have an opportunity to flow test a hydrant and calculate its gallons per minute.

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## FFI - 9H "WATER FLOW TESTS" .

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of how to compute available water and how to use flow test equipment.

### COVERAGE:

Computing available water in a specific area using Pitot tube and guage

### MATERIALS:

1. Chalkboard, chalk
2. Handouts covering formulas and problems
3. Water flow test equipment

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 105, Lesson 15
  - IFSTA 105, Pgs. 169-179
  - IFSTA 107, Pgs. 25-30 (Phases of Burning)
  - IFSTA 205, Pg. 62 (Fire Flow Test)
  - IFSTA 205, Pgs. 73-79 (Water Flow Test Summary Sheet)
  - IFSTA 205, Pg. 70 (Using Pitot Tube and Guage)
  - IFSTA 401, Pgs. 76-79 (Roots)
2. Prepare classroom and materials

### INTRODUCTION:

Emphasize to your students the importance of knowing available water flow and how to use measuring devices and instruments with reference to fire streams.

### PRESENTATION:

1. Fire Flow Tests
  - A. Made on water distribution systems
    - (1) hydrants and water mains
    - (2) to obtain data on how much water will flow from a particular system



- B. Important to pre-fire plans
  - (1) indicates strong points on water system
  - (2) can be used to correct weak points when upgrading is done
- C. Should be run
  - (1) after changes to/or extensions of water mains
  - (2) every five years if no changes have been made
- 2. Computing Available Water in a Specific Area
  - A. Mathematical computations necessary
  - B. Use handout of listed examples (IFSTA 105, pg. 170-177) to explain principles
  - C. Have students work out examples in handouts
- 3. Using Pitot Tube and Gauge
  - A. To take a flow reading at a hydrant
  - B. Explain operation procedures (IFSTA 105, pg. 177)
- 4. Field Operations
  - A. Have each student flow test a hydrant and calculate its gpm

**EVALUATION:**

Through the use of oral or written exam, students should understand the basic principles covered in this lesson.

**TASK PERFORMANCE:**

Task No. 45



## FFI - 91 "WATER APPLICATION"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Applying fire streams effectively
- Handling various nozzles

Teach the following skills:

- Attacking Class "A" fires
- Attacking Class "B" fires

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 105, Lesson 13
2. IFSTA 105, Pgs. 37-53, 131-151

### INSTRUCTOR MATERIALS:

1. Burn barrel for Class "B" fires
2. Fire inside closed room/Class "A" fire at training grounds

### MATERIALS, EQUIPMENT:

1. Pumper
2. Full turnouts
3. Breathing apparatus

### DESCRIPTION OF DRILL:

This drill should emphasize the proper methods of extinguishing Class "A" and "B" fires, including proper nozzle pattern, correct attack, using fire stream effectively and conservatively, and overall evolution performance.

### DRILL SETTING:

This drill should be held at the training ground where a Class "A" fire can be set, or at an abandoned house waiting demolition. Also, a burn barrel for Class "B" fires should be available.

## **FFI - 91 "WATER APPLICATION"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of water application and the skills to handle various nozzles and attack class "A" and "B" fires.

### **COVERAGE:**

Handling, maneuvering, and advancing the nozzle (1- and 2-man methods on 1 1/2-inch and 2 1/2-inch, 3-man method on 2 1/2-inch); applying small streams, fog streams, solid streams, master streams, broken streams

### **MATERIALS:**

1. Pumper
2. Burn barrel for Class "B" fire
3. Materials and/or structure suitable for Class "A" fire
4. Full protective clothing for each participant
5. Breathing apparatus

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 105, Lesson 13
  - IFSTA 105, Pgs. 37-53, 131-151
2. Prepare materials
3. Prepare area suitable for working with fire streams, pumper, full turnouts, department nozzles and hose lines
4. Prepare area suitable for a fire inside a closed area

### **INTRODUCTION:**

Emphasize to your students the importance of strict discipline and student participation in this session. Discuss with your students the importance of proper handling and application of fire streams with reference to proper fire control.

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## PRESENTATION:

Demonstrate the following methods. Then have students perform the task.

1. Handling, Maneuvering, and Advancing One-Man 1 1/2-inch (IFSTA 105, Pgs. 138-146)
2. Handling, Maneuvering, Advancing Two-Man 1 1/2-inch (IFSTA 105, Pgs. 138-146)
3. Handling, Maneuvering, Advancing One-Man 2 1/2-inch (IFSTA 105, Pg. 140)
4. Handling, Maneuvering, Advancing, Two-Man 2 1/2-inch (IFSTA 105, Pgs. 140-146)
5. Handling, Maneuvering, Advancing Three-Man 2 1/2-inch (IFSTA 105, Pgs. 142-146)
6. Applying Small and Fog Streams (IFSTA 105, Pgs. 146-152)
  - A. Demonstrate on live fires
    - (1) confined fires - effectiveness depends on how, where, when applied
    - (2) open fires - more volumes of water needed
    - (3) flammable liquid fires - consideration of type of fuel, methods of use of fog, use of other extinguishing agents
    - (4) ventilation purposes - direction, velocity of fog, size of fog pattern, ways of disrupting ventilation by water fog
  - B. Have students perform the tasks
7. Applying Solid and Master Streams (IFSTA 105, Pgs. 153-156)
  - A. Important factors
    - (1) flow capacity, effective reach - "rule of thumb": one lb. pressure per foot of reach
    - (2) penetration and deflection
    - (3) 80 psi for master solid streams, 100 psi for master fog streams
    - (4) permit firefighters with hand streams to get closer to fire
8. Applying Broken Streams (IFSTA 105, Pg. 157)
  - A. Use in concealed spaces, as water curtains
  - B. Types of nozzles using broken streams, how to use
    - (1) cellar or distributor,
    - (2) partition, puncture
    - (3) sprinkler heads

## EVALUATION:

1. Observation of students during session.
2. Students should be able to perform each task covered in this session.
3. Follow up with other sessions to allow students to improve on efficiency.

## TASK PERFORMANCE:

Tasks No. 43, 44

## FFI - 9J "DEVELOPMENT AND APPLICATION OF FOAM"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Development of foam
- Application of foam
- Storage of foam
- Care and maintenance of foam equipment

Teach the following skills:

- Proper technique of applying foam

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 105, Lesson 16
2. IFSTA 105, Pgs. 179-183

### INSTRUCTOR MATERIALS:

1. Chalkboard, chalk
2. Visual aids
3. Burn barrel

### MATERIALS, EQUIPMENT:

Foam and foam equipment (if available)

### DESCRIPTION OF DRILL:

This drill should emphasize the development, application, storage, care and maintenance of foam and foam equipment.

### DRILL SETTING:

This drill should have a short classroom session and allow for time at the training grounds where students can have the opportunity to apply foam to liquid fires.

## FFI - 9J "DEVELOPMENT AND APPLICATION OF FOAM"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of the development and application of foam and the proper technique of applying foam.

### COVERAGE:

Development of foam; equipment used to apply foam; practical application of foam; proper storage of foam

### MATERIALS:

1. Chalkboard, chalk
2. Burn barrel
3. Visual aids
4. Department foam equipment

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 105, Lesson 16
  - IFSTA 105, Pgs. 179-183
2. Prepare area suitable for applying foam

### INTRODUCTION:

Discuss with your student the types of fires and the areas in the district where foam would be utilized. Cite previous examples of fires.

### PRESENTATION:

1. Development of Foam
  - A. Two solutions, mixed - World War I
  - B. Two-powder foam
  - C. Foam Liquid - Sweden
  - D. Protein base (mechanical, air, or low expansion) World War II
  - E. Most common means of inducing foam compound
    - (1) Venturi nozzle
    - (2) in-line educator
  - F. Penetrant based foam

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- G. Ultra-high expansion foam
- H. Fluorocarbon and fluoroprotein base foam (AFFF-aqueous film-forming foam)
  - (1) most effective in combination with dry chemical agent
  - (2) vapor sealing barrier
- 2. Application of foam
  - A. Should not be older than about three years
    - (1) use oldest for training first
  - B. Expansion 10 to 1, per square foot
    - (1) alcohol fires - twice as much
    - (2) when water limited on interior fire, more rapid rate of application recommended
  - C. Most successful methods
    - (1) bounce stream off solid surface
    - (2) if level surface sweep from front of fire
    - (3) slow and deliberate sweep
    - (4) in a tank, directed against side or other obstacle (as a splash board)
- 3. Foam applying equipment
  - A. Venturi pick-up nozzle
  - B. Eductors or proportioners
  - C. Use visual aids
  - D. Demonstrate department equipment (live fires)
    - (1) operation
    - (2) cleaning
  - E. Have students perform the tasks
- 4. Storage of foam
  - A. Precautions to be taken
  - B. Suggestions, use department storage area for examples

EVALUATION:

- 1. Observation of students during session.
- 2. Students should be able to set up and operate department foam equipment.
- 3. Through oral or written exam, students should be able to demonstrate understanding of the basic information presented during this session.
- 4. Follow up with other sessions to allow students to improve on efficiency.

TASK PERFORMANCE:

Task No. 46

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## FFI - 10 VENTILATION

FFI - 10A	Introduction to Ventilation	1 hour
FFI - 10B	Combustion, Heat, Phases of Burning, and Natural Laws of Heat	1 hour
FFI - 10C	Construction Influencing Fire Spread, Types of Roofs, and a Variety of Venting Devices	2 hours
FFI - 10D	Evaluation and Size-Up	2 hours
FFI - 10E	Vertical Ventilation	1 hour
FFI - 10F	Ventilating a Roof	1 hour
FFI - 10G	Horizontal or Cross Ventilation	1 hour
FFI - 10H	Ventilation Using Water Fog	1 hour
FFI - 10I	Forced Ventilation	1 hour
FFI - 10J	Ventilation Using an Exhaust Fan	1 hour
TOTAL		12 hours

## FFI - 10A "INTRODUCTION TO VENTILATION"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of the following:

- Objectives of firefighters
- Advantages of ventilation
- Requirements for combustion

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 107, Lesson 1  
(up to Flammable Liquid Characteristics)
2. IFSTA 107, Pgs. 3-17
3. IFSTA 402, Pgs. 79-80 (Combustion and Heat)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition
  - 2-2 (Chemistry and Physics of Fire)
  - 2-24 (Chemical Extinguishment)

### INSTRUCTOR MATERIALS:

1. Film "Ventilation" (recommended)

### DESCRIPTION OF DRILL:

This drill should emphasize the responsibility of firefighters; advantages of ventilation; and requirements for combustion (fire triangle and fire tetrahedron). The film "Ventilation" is recommended as an overview of ventilation practices.

### DRILL SETTING:

This drill should be held in the classroom.



## **FFI - 10A "INTRODUCTION TO VENTILATION"**

### **TIME:**

1 hour

### **OBJECTIVES:**

To provide students with a basic understanding of combustion and advantages of ventilation with regards to their responsibilities as firefighters.

### **COVERAGE:**

Responsibility of firefighters; objectives and advantages; requirements for burning

### **MATERIALS:**

1. Chalkboard, chalk
2. Film "Ventilation" (if available)
3. Projector, screen

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 107, Lesson 1
  - IFSTA 107, Pgs. 3-17
  - IFSTA 402, Pgs. 79-80 (Combustion and Heat)
2. Make ready materials
3. Make ready classroom

### **INTRODUCTION:**

Read out of the manual - IFSTA 107, Pg. 3, paragraphs 1 and 2.  
Discuss introduction. Show film "Ventilation".

### **PRESENTATION:**

Discuss examples of various conditions which would substantiate the material presented in this session.

1. Responsibility of Firefighters
  - A. Each member must have thorough knowledge of ventilation
  - B. Choose alternatives right for situation

2. Objectives and advantages
  - A. Aids life-saving and rescue
    - (1) Removes smoke and gases
    - (2) Makes conditions safer for firefighters
  - B. Speeds attack and extinguishment
    - (1) Aids in determining path of fire
    - (2) Allows firefighters to take proper action
  - C. Reduces the danger of back draft or smoke explosion
  - D. Reduces mushrooming
  - E. Makes firefighting easier
  - F. Reduces fire and water damage
  - G. Reduces smoke and heat damage
  - H. Permits prompt salvage operations
  - I. Helps provide confinement
3. Requirements for Burning
  - A. The fire triangle
    - (1) Oxygen (oxidizing agent)
    - (2) Heat (temperature)
    - (3) Fuel (reducing agent)
  - B. The fire tetrahedron
    - (1) Oxygen (oxidizing agent)
    - (2) Heat (temperature)
    - (3) Fuel (reducing agent)
    - (4) Chemical chain reaction
4. Extinguishment
  - A. Removal of fuel (reducing agent)
  - B. Exclude oxygen (oxidizing agent)
  - C. Reduce the temperature

EVALUATION:

Have students list advantages of ventilation either orally or through written quiz.

**FFI - 10B "COMBUSTION, HEAT, PHASES OF BURNING, AND  
NATURAL LAWS OF HEAT"**

**TIME:**

1 hour

**OBJECTIVES:**

Develop a basic understanding of the following:

- Characteristics of flammable liquids
- Phases of burning
- Transmission of heat
- Natural laws of heat

**INSTRUCTOR REFERENCES:**

1. IFSTA Instructor's Guide Sheet 107, Lesson 2 (from Flammable Liquid Characteristics) and 3
2. IFSTA 107, Pgs. 17-41, 68
3. IFSTA 105, Pgs. 12-13 (Law of Specific Heat)
4. IFSTA 105, Pgs. 14-16 (Law of Latent Heat of Vaporization)
5. IFSTA 108, Pgs. 10-16 (Respiratory Hazards to Rescue Workers)
6. IFSTA 206, Pgs. 28-31 (Fuel Systems)
7. IFSTA 402, Pgs. 79-97 (Combustion and Heat)

**SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:**

1. Fire Protection Handbook - 14th edition
  - 2-4 (Ignition Temperature, Flammable Limits, Flammable Range, and Flashpoint)
  - 3-137 (Fire Hazard Properties of Liquids)
  - 2-16 (Products of Combustion and Their Effects on Safety)
  - 3-41 (Gas Fuels)
  - 2-30 (Theory of Smoke and Heat Venting)
  - 2-27 (Cooling Effect of Ventilation)
  - 2-7 (Heat Transfer)

**DESCRIPTION OF DRILL:**

This drill should emphasize the different characteristics of flammable liquids; the three phases of burning; the four ways heat is transmitted; and the different natural laws of heat.

DRILL SETTING:

This drill should be held in the classroom. Training aids should be used to depict key points of this topic.

**FFI - 10B "COMBUSTION, HEAT, PHASES OF BURNING, AND  
NATURAL LAWS OF HEAT"**

**TIME:**

1 hour

**OBJECTIVES:**

To provide the student with a basic understanding of combustion, heat, phases of burning, and natural laws of heat.

**COVERAGE:**

Characteristics of flammable liquids; products of combustion; phases of burning; transmission of heat; expansion of gases; accumulated smoke and gases

**MATERIALS:**

Chalkboard, chalk

**PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 107, Lessons 2 and 3
  - IFSTA 107, Pgs. 17-41, 68
2. Make ready classroom

**INTRODUCTION:**

Emphasize to your students the importance of knowing characteristics of combustibles, phases of burning, etc., in order to do an adequate job during emergency situations. Review Lesson FFI - 10A briefly to refresh student's memory with regard to advantages of ventilation and requirements for combustion.

**PRESENTATION:**

1. Flammable Liquid Characteristics
  - A. Flash point - "the lowest temperature at which a material will give off vapors in sufficient quantity to ignite momentarily."
    - (1) An increase in temperature causes a proportionate increase in vapor
    - (2) The reverse is true when you reduce temperature
  - B. Burning point - "the temperature at which a material will give off vapor rapidly enough to sustain combustion."

- C. Ignition temperature - "first, it is the minimum temperature required to ignite a material; second, it is the temperature at which a material will ignite spontaneously, independent of an outside ignition source."
- D. Explosive limits - "the range of vapor mixture which will ignite when subjected to an ignition source."
  - (1) Upper limit - maximum vapor mixture
  - (2) Lower limit - minimum vapor mixture
- E. Vapor density - "the weight of vapors compared to air."
  - (Illustrate importance of this concept to firefighters when dealing with common gases and potential sources of ignition such as pilot lights, sparks, etc.)
- 2. Products of Combustion (discuss each item)
  - A. Fire gases
  - B. Flame
  - C. Heat
  - D. Smoke
- 3. Fire in a closed Building
  - A. Incipient or beginning phase
    - (1) oxygen content not significantly reduced
    - (2) updraft of heat present
    - (3) breathing not difficult
    - (4) ventilation not a problem
    - (5) little steam production (show illustration IFSTA 107, pg. 26)
  - B. Free burning or second phase
    - (1) fire has involved more fuel
    - (2) oxygen being depleted
    - (3) heat accumulating at upper levels
    - (4) breathing difficult (masks recommended)
    - (5) ventilation - not a definite need
    - (6) good steam production (show illustration IFSTA 107, pg. 27)
  - C. Smoldering or third phase
    - (1) free burning has ceased
    - (2) oxygen supply not equal to demands of fire
    - (3) temperature throughout building very high
    - (4) normal breathing is not possible
    - (5) oxygen deficiency may cause back draft
    - (6) extinguishment - indirect method
    - (7) ventilation - a must
    - (8) maximum steam production from water fog
- 4. Transmission of Heat
  - A. The law of heat flow
    - (1) heat tends to flow from a hot substance to a cold substance
    - (2) one substance will absorb heat from another
  - B. Conduction "the transfer of heat from one substance to another."
    - (1) metals are good conductors
    - (2) liquids and gases are poor conductors
  - C. Radiation - "the transfer of heat through air"
  - D. Convection - "the upward movement of heated air"
  - E. Direct flame contact
- 5. The Law of Specific Heat - "The heat absorbing capacity of a substance"
  - measured in BTU's (British Thermal Units) (IFSTA 107, Pg. 38)

6. Latent Heat of Vaporization (IFSTA 107, Pgs. 39-40)
7. Expansion of Gases
  - A. When gases are heated they expand
  - B. Expansion in most gases is nine times that of water
8. Accumulated Smoke and Gases
  - A. Dangerous to the firefighter
  - B. Makes movement difficult inside a building
  - C. Many gases may be toxic

EVALUATION:

Through oral or written examination students should understand basic principles of this session.

**FFI - 10C "CONSTRUCTION INFLUENCING FIRE SPREAD,  
TYPES OF ROOFS, AND A VARIETY OF  
VENTING DEVICES"**

**TIME:**

2 hours

**OBJECTIVES:**

Develop a basic understanding of the following:

- Building construction features
- Types of roof construction
- Types of venting devices
- Problems in venting different types of construction

**INSTRUCTOR REFERENCES:**

1. IFSTA Instructor's Guide Sheet, Lessons 4 and 5
2. IFSTA 107, Pgs. 45-63
3. IFSTA 101, Pg. 7 (General Building Construction)
4. IFSTA 101, Pg. 8 (Fire Stops)
5. IFSTA 101, Pgs. 33-39 (Sliding Doors and Forcing Technique)
6. IFSTA 101, Pg. 75 (Special Forcible Entry Operations)
7. IFSTA 110, Pgs. 89-117 (Building and Occupancy Classification)
8. IFSTA 302, Pg. 29 (Interior Protection Facilities)

**SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:**

1. NFPA 203M-8 (Selection of Roof Coverings from a Fire Standpoint)
  - 203M (Manual on Roof Coverings)
  - 203M-8 (Built-up Coverings)
2. NFPA 204-Section 5, Appendix (Heat Released from Burning Surfaces)
  - 204-232 (Heat Release, Contents Categorized)
  - 204-131 (Classification of Occupancies)
  - 204-Section 4 (Inspection and Maintenance of Vents)
  - 204-230 (Dimensions and Spacing of Vents)
  - 204-120 (Principles of Venting)
  - 204-200 (Types of Vents)
  - 204-220 (Effective Vent Area)
  - 204-Section 3 (Curtain Boards)
  - 204-240 (Venting Ratios - Stack Effect)
  - 204-101 (Effect of Curtain Boards and Monitors)
  - 204-201A (Monitors)
  - 204-201B (Continuous Gravity Vents)
  - 204-201C (Unit Type Vents)
  - 204-201D (Sawtooth Roof Skylights)
  - 204-201E (Exterior Wall Windows)
3. Fire Protection Handbook - 14th edition
  - 2-27 (Venting Methods and Applications)
  - 2-31 (Calculating Vent Areas)



DESCRIPTION OF DRILL:

This drill should emphasize general building construction features; different types of roof construction; different types of venting devices; and problems in venting different types of construction.

DRILL SETTING:

This drill should be held in the classroom. Training aids should be used to depict key points of this topic.

**FFI - 10C "CONSTRUCTION INFLUENCING FIRE SPREAD,  
TYPES OF ROOFS, AND A VARIETY OF  
VENTING DEVICES"**

**TIME:**

2 hours

**OBJECTIVES:**

To provide the student with a basic understanding of construction influencing fire spread, types of roofs, and a variety of venting devices.

**COVERAGE:**

General building construction features; roof construction; roof openings; occupancy and contents; underground structures and windowless buildings; high rise buildings

**MATERIALS:**

1. Chalkboard, chalk
2. Visual aids (if available)

**PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 107, Lessons 4 and 5
  - IFSTA 107, Pgs. 45-63
  - IFSTA 101, Pgs. 7, 8, 33-39, 75
  - IFSTA 110, Pgs. 89-117
  - IFSTA 302, Pg. 29
2. Make ready materials
3. Make ready classroom

**INTRODUCTION:**

Discuss with your students the importance of understanding building construction and various items affecting fire spread. Emphasize additional damage which can be caused by cutting or chopping at wrong points within a structure. Share experiences with your students which might support this discussion.

**PRESENTATION:**

1. General Building Construction Features
  - A. Discuss illustration on Pg. 47, IFSTA 107
  - B. Discuss role of fire stops
2. Roof Construction (IFSTA 107, Pg. 48)
  - A. Draw and discuss
    - (1) Flat
    - (2) Shed
    - (3) Butterfly
    - (4) Hip
    - (5) Mansard
    - (6) Lantern
    - (7) Gambrel
    - (8) Dome
    - (9) Gable
3. Roof Openings
  - A. Roof stairway access doors
  - B. Hatches
  - C. Skylights
  - D. Ventilator openings
  - E. Elevator shafts
4. Occupancy and Contents
  - A. Factors influencing ventilation procedures
    - (1) Number and location of people
    - (2) Extent to which escape routes may be blocked
    - (3) Combustibles (quantity and type)
    - (4) Combustibles (location)
    - (5) Toxicity and explosion hazards
    - (6) Fire detecting and extinguishing systems available
5. Automatic Venting Devices
  - A. Curtain boards
    - (1) Trap and retard smoke and heat
    - (2) Confine heated air
  - B. Monitors
    - (1) Rectangular projections
    - (2) Open when fire occurs
  - C. Gravity vents
  - D. Unit Type vents
  - E. Skylights
  - F. Exterior wall windows
6. Underground Structures and Windowless Buildings
  - A. Require forced ventilation
  - B. Life hazard is increased
7. High-rise Buildings
  - A. Fire prevention is a must; tenants should know:
    - (1) The value of closed doors
    - (2) How to transmit an alarm
    - (3) How to alert occupants
    - (4) The operation of fire extinguishers
    - (5) How to prevent smoke from entering room

**EVALUATION:**

Develop and administer an exam covering the various topics taught in this session.

## FFI - 10D "EVALUATION AND SIZE-UP"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Size-up with regard to ventilation
- Requirements for ventilation
- Dangers of smoke and gases
- Precautions before venting
- Performing rescue work

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet - Lesson 6
2. IFSTA 107, Pgs. 67-80, review Pg. 21
3. IFSTA 106, Pg. 39 (Spotting Apparatus)
4. IFSTA 108, Pgs. 10-16 (Respiratory Hazards to Rescue Workers)
5. IFSTA 301, Pgs. 78, 85 (Directing the Ventilation)
6. IFSTA 301, Pg. 84 (Providing Exposure Protection)
7. IFSTA 302, Pg. 31 (Exterior Protection Facilities)
8. IFSTA 302, Pg. 54 (Life Safety of Occupants)
9. IFSTA 302, Pg. 55 (Exposures)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition, Chapter 3, (Protection Against Exposures)

### DESCRIPTION OF DRILL:

This drill should emphasize the requirements and decisions that are necessary for ventilation; dangers of smoke and toxic gases produced by burning material; recognizing indications of fire intensity; precautions that are necessary for successful ventilation; and performing rescue.

### DRILL SETTING:

This drill should be held in the classroom. Visual aids should be used to depict key points of this topic. The instructor should also be familiar with the following IFSTA manuals:

1. IFSTA 108 "Fire Service Rescue and Protective Breathing Practices"

2. IFSTA 109 "Fire Service First Aid Practices" (Handling Victims)
3. IFSTA 110 "Fire Prevention and Inspection Practices" (Surveys and Inspections)

## FFI - 10D "EVALUATION AND SIZE-UP"

### TIME:

2 hours

### OBJECTIVES:

To provide the students with a basic understanding of evaluation and size-up procedures involved in determining if ventilation is necessary, and what type of ventilation will be used if a need is determined.

### COVERAGE:

Requirements for ventilation; the nature of accumulated smoke and gases; visible smoke conditions; smoke odors; providing fire control; heat conditions and fire severity; life hazards to occupants; potential hazards to fire service personnel; performing rescue work

### MATERIALS:

Chalkboard, chalk

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 107, Lesson 6
  - IFSTA 107, Pgs. 67-80
2. Make ready materials
3. Make ready classroom

### INTRODUCTION:

Emphasize to your students the concept that a firefighter faces many variables and unknown factors when preparing to ventilate. He must select the proper method, place, means, etc., to best meet the situation. He does this through experience and training sessions like the one in which he is about to participate.

### PRESENTATION:

1. Requirements for Ventilation (discuss each item)
  - A. First decision: Is there a need?
    - (1) Based on heat
    - (2) Based on smoke
    - (3) Gas conditions

- B. Second decision: Where is ventilation needed?
    - (1) Based on construction features
    - (2) Based on exposures
    - (3) Based on wind direction
    - (4) Based on extent of fire
    - (5) Based on location of fire
    - (6) Based on natural openings available
  - C. Third decision: What type of ventilation?
    - (1) Openings from interior to exterior
    - (2) Displace, by use of steam
    - (3) Forced air ventilation
- Safety would always be a factor when determining the above items.*
- 2. The Nature of Accumulated Smoke and Gases
    - A. Danger to occupants and firefighters
    - B. Added difficulty in locating fire
      - (1) Heat
      - (2) Smoke
    - C. Types of gases present
    - D. Physical effects on structure
    - E. Flammability of gases
  - 3. Visible Smoke Conditions
    - A. Indicates fire progression
      - (1) Vertical
      - (2) Horizontal
      - (3) Intensity
    - B. Fire location
      - (1) Room
      - (2) Vertical extension (attic)
      - (3) Material involved
  - 4. Smoke Odors
    - A. Assist in determining what's burning
    - B. Difficult to recognize any more
  - 5. Providing Fire Control - *Before ventilating, a fire officer must provide manpower and adequate fire control facilities.*
    - A. Precautions before venting
      - (1) Protect men who are ventilating with a charged line
      - (2) Be prepared for fire flare-up
    - B. Protect exposures
    - C. Wind considerations
  - 6. Heat Conditions and Fire Severity
    - A. Smoke observations
    - B. Indicators of heat conditions
      - (1) Feeling walls, doors, windows
      - (2) Hot spots
      - (3) Time and over-all temperature (IFSTA 107, Pg. 75)
  - 7. Life Hazards to Occupants
    - A. Overcome by smoke and gases
    - B. Lost in building
  - 8. Potential Hazards to Fire Service Personnel
    - A. Obscurity caused by dense smoke
    - B. Poisonous gases
    - C. Lack of oxygen
    - D. Presence of flammable gases
    - E. Serious damage to structure

9. Performing Rescue Work
  - A. Influenced by
    - (1) Stage of burning
    - (2) Manpower
10. Anticipating the Situation
  - A. Probable location of fire
  - B. Type of building
  - C. Contents
  - D. Occupancy
  - E. Action of fire
11. Gathering Facts
  - A. Visible smoke
  - B. Smoke odor
  - C. Heat
12. Evaluating Facts
  - A. Personal Protection
  - B. Exposures
  - C. Material burning
  - D. Extinguishment method
  - E. Location of fire
  - F. Fire travel
  - G. Smoke and gas travel
  - H. Extent of fire
  - I. Manpower and equipment
  - J. Rescue requirements
  - K. Building construction
  - L. Occupancy
  - M. Weather conditions
13. Determining Procedures
  - A. Rescue Procedures
    - (1) Establish need
    - (2) Use most desirable method
  - B. Fire protection requirements
    - (1) Exposures protected
    - (2) Charged lines in place
  - C. Ventilation procedures
    - (1) Place(s) to ventilate
    - (2) Time to ventilate
    - (3) Methods to ventilate
  - D. Extinguishment procedures
    - (1) Place(s) to enter
    - (2) Methods of extinguishment

**EVALUATION:**

Through written or oral examination, the student should indicate his understanding of the principles taught during this session. Utilize items covered in this class in future sessions.

NFPA 1001 STANDARD 3-10.2



## FFI - 10E "VERTICAL VENTILATION"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of the following:

- Vertical ventilation procedures
- Upward vertical extension
- Downward vertical extension
- Selecting site for ventilation
- Tools needed for vertical ventilation
- Opening roofs

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 107, Lesson 7
2. IFSTA 107, Pgs. 81-98
3. IFSTA 201, Pgs. 9-11 (Care and Handling of Tools)
4. IFSTA 101, Pg. 53 (Flat Roof Construction and Opening Techniques)
5. IFSTA 101, Pg. 74 (Opening Techniques for Ceilings)
6. IFSTA 102, Pg. 34 (Ladder Climbing Skills)
7. IFSTA 105, Pg. 82, 100 (Horizontal and Vertical Extension)
8. IFSTA 106, Pg. 120 (Operating Elevated Ladder Pipes)
9. IFSTA 103, Pg. 65 (Fire Department Ropes and Knots)
10. IFSTA 206, Pgs. 68-72 (Special and Conventional Tools)
11. IFSTA 302, Pg. 55 (Vertical Openings)

### MATERIALS, EQUIPMENT:

1. Chain saw/circular saw
2. Pick-headed fire axe
3. Pike pole
4. Spanner wrench
5. Crowbar
6. Wire cutters

### DESCRIPTION OF DRILL:

This drill should emphasize vertical ventilation procedures which would include how fires extend through structures; selecting site for ventilation; name and proper use of tools needed in ventilation; selecting the site for ventilation; and proper method for opening roofs.

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DRILL SETTING:

This drill should be held in the classroom or a location with adequate space to demonstrate the different tools used in ventilation and to demonstrate the correct procedure in opening roofs.

## **-FFI - 10E "VERTICAL VENTILATION"**

### **TIME:**

1 hour

### **OBJECTIVES:**

To provide the student with a basic understanding of vertical ventilation and related tasks.

### **COVERAGE:**

Getting manpower and tools to the roof; selecting the place to ventilate; utilizing natural roof openings; opening the roof; top level ventilation procedures; safety precautions; precautions against upsetting established vertical ventilation

### **MATERIALS:**

1. Chain saw/circular saw
2. Pick headed fire axe
3. Pike pole
4. Spanner wrench
5. Crow bar
6. Wire cutters
7. Other forcible entry tools used by the department having jurisdiction
8. Chalkboard, chalk

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 107, Lesson 7
  - IFSTA 107, Pgs. 81-98
  - IFSTA 201, Pgs. 9-11
  - IFSTA 101, Pgs. 53, 74
  - IFSTA 102, Pg. 34
  - IFSTA 105, Pgs. 82, 100
  - IFSTA 106, Pg. 120
  - IFSTA 108, Pg. 65
  - IFSTA 206, Pgs. 68-72
  - IFSTA 302, Pg. 55
2. Make ready materials
3. Make ready classroom

## INTRODUCTION:

Discuss with your students the importance of knowing vertical ventilation procedures, and being able to perform related tasks.

## PRESENTATION:

1. Getting Manpower and Tools to the Roof
  - A. Discuss department procedures
  - B. Emphasize safety when taking equipment to roof
  - C. Memorize name and functions of tools
2. Selecting the Place to Ventilate
  - A. Availability of natural openings
  - B. Location of fire and desirable routing of heat and gases
  - C. Type of construction
  - D. Wind direction
  - E. Extent of fire
  - F. Condition of building and contents
3. Utilizing Natural Roof Openings
  - A. Scuttle hatches
  - B. Skylights
  - C. Monitors
  - D. Ventilation shafts
  - E. Stairway doors
4. Opening the Roof
  - A. Decision to open
  - B. Coordination with attack crews
  - C. Size of roof cuts
  - D. Shape of roof cut
    - (1) Rectangular
    - (2) Square
    - (3) Trench ventilation
5. Opening Flat Roofs
  - A. Location of vent hole - determined by:
    - (1) Location and intensity of fire
    - (2) Height and angle of roof
    - (3) Wind
  - B. Location of rafters
  - C. Mark outline of intended cut
  - D. Use axe to clean off roof
  - E. Cut decking alongside rafters
  - F. Use short strokes with axe
  - G. Remove boards with pick of axe
  - H. Power equipment may be preferable
6. Opening Pitched Roofs
  - A. Place roof ladder
    - (1) Upwind
    - (2) Alongside proposed cut
    - (3) Make sure hooks are secured
  - B. Rip off shingles or roof covering
  - C. Cut sheathing alongside rafters
  - D. Remove sheathing alongside rafters

7. Top Level Ventilation Procedures
  - A. Coordinate with ground and attack companies
  - B. Observe wind direction
  - C. Note obstructions or weight on roof
  - D. Secure lifeline to roof
  - E. Utilize natural roof openings whenever possible
  - F. Cut a large hole rather than several small ones
  - G. Do not damage main structural supports
  - H. Work with the wind
  - I. Guard the opening
  - J. Break out ceiling after hole is cut
8. Safety Precautions
  - A. Provide secondary means of escape
  - B. Avoid spongy or springy roofs
  - C. Secure lifelines
  - D. Protect personnel
  - E. Exercise caution around electrical wires
  - F. Be careful of axe while swinging
  - G. Raise/lower tools and equipment with care
9. Precautions Against Upsetting Vertical Ventilation
  - A. Improper forced ventilation
  - B. Breakage of glass
  - C. Improperly directed fire streams
  - D. Breakage of skylights
  - E. An explosion
  - F. A burn through
  - G. Additional openings

EVALUATION:

Through written or oral examination, students should understand principles and procedures taught in this session.

TASK PERFORMANCE:

Task No. 47

## FFI - 10F "VENTILATING A ROOF"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of the following:  
--Ventilating a roof

Teach the following skills:  
--Selecting site for ventilation  
--Ventilating a roof using a fire axe  
--Ventilating a roof using chain or circular saw

### INSTRUCTOR REFERENCES:

1. IFSTA 107, Pgs. 86-97 (Selecting the Place to Ventilate)
2. IFSTA 101, Pgs. 52-63 (Opening Roofs)

### MATERIALS, EQUIPMENT:

1. Pick-headed fire axe
2. Chain or circular saw
3. 24-foot extension ladder
4. Roof ladder
5. Pike pole
6. Rope hose tool

### DESCRIPTION OF DRILL:

This drill should emphasize the student's ability to use ventilating equipment properly in ventilating a roof. This would include location of hole, size of hole, safe use of equipment and following accepted procedures in vertical ventilation.

### DRILL SETTING:

This drill should be held at an abandoned building awaiting demolition or the fire department training ground where a simulated roof can be constructed. The students should be familiar with Lesson FFI-10E before this drill.

## FFI - 10F "VENTILATING A ROOF"

### TIME:

1 hour

### OBJECTIVES:

- To teach the skills involved in vertically ventilating a roof.

### COVERAGE:

Selecting site for ventilation; ventilating a roof utilizing a fire axe; ventilating a roof using a chain or circular saw

### MATERIALS:

1. Pick-headed fire axe
2. Chain or circular saw
3. 24-foot extension ladder
4. Roof ladder
5. Pike pole
6. Rope hose tool

### PREPARATION:

1. Review Lesson FFI - 10E
2. Make ready materials
3. Make ready abandoned building or props

### INTRODUCTION:

Review orally, Lesson FFI - 10E. Emphasize the importance of strict discipline during this session. (Re-emphasize SAFETY.)

### PRESENTATION:

1. Discuss selection of a site for ventilation
2. Demonstrate venting a roof with a fire axe
3. Have students vent the roof with a fire axe
4. Demonstrate venting a roof with a power saw
5. Have students vent a roof with a power saw

Proceed with practical application as long as time permits.

**EVALUATION:**

3. Observation of students during the session.

**TASK PERFORMANCE:**

Task No. 47



## FFI - 106 "HORIZONTAL OR CROSS VENTILATION"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of the following:

- Horizontal ventilation procedures
- Horizontal extension
- Obstruction to cross ventilation
- Using windows or horizontal ventilation
- Application of water fog to aid ventilation

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet, Lesson 8
2. IFSTA 107, Pgs. 99-112
3. IFSTA 101, Pg. 22 (Breaking Glass)
4. IFSTA 101, Pgs. 42-51 (Opening Windows)
5. IFSTA 101, Pg. 68 (Opening Walls, Partitions, and Ceilings)
6. IFSTA 105, Pgs. 27-30 (Kinds of Pressure on Fluids and Atmospheric Pressure)
7. IFSTA 105, Pgs. 9-10 (Water as an Extinguishing Agent)

### DESCRIPTION OF DRILL:

This drill should emphasize procedures of horizontal ventilation including: horizontal extension; importance of wind direction; exposures; use of windows; and obstructions to cross ventilation. The drill should introduce the principle of using water fog as an aid to ventilation.

### DRILL SETTING:

This drill should be held in the classroom. Training aids should be used to depict key points of this topic.

## FFI - 10G "HORIZONTAL OR CROSS VENTILATION"

### TIME:

1 hour

### OBJECTIVES:

To provide the student with a basic understanding of horizontal or cross ventilation and related operations.

### COVERAGE:

Horizontal ventilation procedures; horizontal extension; obstruction to cross ventilation; using windows or horizontal ventilation; use of water fog for ventilation

### MATERIALS:

Chalkboard, chalk

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 107, Lesson 8
  - IFSTA 107, Pgs. 99-112
  - IFSTA 101, Pgs. 22, 42-51, 68
  - IFSTA 105, Pgs. 9-10, 27-30
2. Make ready classroom
3. Make ready materials

### INTRODUCTION:

Discuss the importance of horizontal or cross ventilation, and being able to perform related tasks.

### PRESENTATION:

1. Structures Where Horizontal Ventilation May Be Applied
  - A. Residential - no fire in attic
  - B. Building with high windows
  - C. Attics of residential-type buildings with louver vents
  - D. Involved floors of multi-floor buildings
  - E. Buildings with large unsupported areas beneath the roof

2. Weather Conditions
  - A. Wind (direction)
    - (1) Windward
    - (2) Leeward
3. Exposures
  - A. Internal
    - (1) Occupants
    - (2) Other rooms
  - B. External
    - (1) Other buildings
    - (2) Other stories of involved building
4. Provide Charged Lines
  - A. When entering building
  - B. When venting building
5. Obstructions to Cross Ventilation
  - A. Walls
  - B. Contents
  - C. Partitions
6. Application of Water Fog
  - A. Changes to steam
  - B. Expands atmosphere

*Utilize remaining time to review previous lessons in this unit.*

**EVALUATION:**

Through written or oral examination, students should understand the basic principles and procedures taught in this session.

NFPA 1001 STANDARD 3-10.1

## FFI - 10H "VENTILATION USING WATER FOG"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of the following:  
--Ventilation using water fog

Teach the following skills:  
--Direct fog application  
--Indirect fog application

### INSTRUCTOR REFERENCES:

1. IFSTA 107, Pgs. 106-112

### MATERIALS, EQUIPMENT:

1. Pumper
2. 1 1/2-inch hose line
3. Fog nozzle (adjustable)

### DESCRIPTION OF DRILL:

This drill should emphasize the correct method of direct and indirect application of water fog for ventilation. The students should demonstrate their ability to ventilate a building by projecting a fog stream through an open door or window.

### DRILL SETTING:

This drill should be held in an abandoned building awaiting demolition or the fire department training grounds.

## FFI - 10H "VENTILATION USING WATER FOG"

### TIME:

1 hour

### OBJECTIVES:

To provide students with a basic understanding of the utilization of water fog to effect ventilation and related skills.

### COVERAGE:

Direct fog application; indirect fog application; precautions against upsetting established cross ventilation

### MATERIALS:

1. Pumper
2. 1 1/2-inch hose line(s)
3. Fog nozzle(s) (adjustable)

### PREPARATION:

1. Review the following material as you feel necessary:  
--IFSTA 107, Pgs. 106-112
2. Make ready materials
3. Make ready building or props

### INTRODUCTION:

Explain to your students that this will be a practical application class and there will be a need to pay strict attention. (Re-Emphasize SAFETY.)

### PRESENTATION:

1. Read IFSTA 107, Pgs. 106-111
2. Demonstrate direct fog application
3. Have students perform the task
4. Demonstrate indirect fog application
5. Have students perform the task

*Utilize remaining time to practice skills.*

**EVALUATION:**

Observation of students during session; discussion of the application of water fog both during the class and afterwards.

**TASK PERFORMANCE:**

Task No. 48

## FFI - 101 "FORCED VENTILATION"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of the following:

- Forced ventilation
- Advantages and disadvantages of forced ventilation
- Equipment needed for forced ventilation

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 107, Lesson 9
2. IFSTA 108, Pgs. 113-119
3. IFSTA 102, Pg. 112 ("A"-frame Ladder Information)
4. IFSTA 102, Pg. 30 (Safety Measures for Climbing Ladders)

### MATERIALS, EQUIPMENT:

1. Exhaust fan (smoke ejector)
2. Folding Ladder (attic ladder)
3. Salvage cover
4. Rope hose tool

### DESCRIPTION OF DRILL:

This drill should emphasize the principles of forced ventilation; the advantages and disadvantages of forced ventilation; equipment needed for forced ventilation; and use of exhaust fan (smoke ejector).

### DRILL SETTING:

This drill should be held in the classroom or an area large enough to demonstrate the use of the exhaust fan (smoke ejector). The use of training aids should be used to depict key points of this topic. *If time permits, a review of all aspects of ventilation could be conducted. The film "Ventilation" could be used again for review and reinforcement.*

## FFI - 101 "FORCED VENTILATION"

### TIME:

1 hour

### OBJECTIVES:

To provide the student with a basic understanding of forced ventilation and related skills.

### COVERAGE:

Situations requiring forced ventilation; advantages of forced ventilation; disadvantages of forced ventilation; forced ventilation equipment

### MATERIALS:

1. Exhaust fan (smoke ejector)
2. Folding ladder (attic ladder)
3. Salvage cover
4. Rope hose tool

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 107, Lesson 9
  - IFSTA 107, Pgs. 113-119

### INTRODUCTION:

Discuss with your students the importance of forced ventilation; both to fire operations and public relations. Have students list situations where forced ventilation has been used successfully in the department.

### PRESENTATION:

1. Situations Requiring Forced Ventilation
  - A. When structure is not suitable for natural ventilation
  - B. When fire is below ground level
  - C. Where no fire is present, but you must remove smoke and/or gases
2. Advantages of Forced Ventilation
  - A. Insures more positive control
  - B. Supplements natural ventilation
  - C. Speeds removal of contaminants
    - (1) Rescue
    - (2) Extinguishment

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- D. May be used where other methods fail
- E. Reduces smoke damage
- F. Promotes good public relations
- 3. Some Disadvantages of Forced Ventilation
  - A. Can move fire along with smoke, extending it to lateral areas
  - B. Can introduce air in too large of volume, causing a fire to spread
  - C. Is dependent upon power
  - D. Requires additional manpower
  - E. Requires special equipment
- 4. Forced Ventilation Equipment
  - A. Demonstrate how each piece of equipment is operated (IFSTA 107, Pgs. 116-119)
  - B. Have students operate the equipment

**EVALUATION:**

Observation of students during the session.

**TASK PERFORMANCE:**

Tasks No. 49, 50

## FFI - 10J "VENTILATION USING AN EXHAUST FAN"

### TIME:

1 hour

### OBJECTIVES:

Develop a basic understanding of the following:

--Use of an exhaust fan

Teach the following skills:

--Assembling necessary equipment to hang the exhaust fan

### INSTRUCTOR REFERENCES:

IFSTA 107, Pgs. 115-119

### MATERIALS, EQUIPMENT:

1. Exhaust fan
2. Salvage cover
3. Folding ladder
4. Rope hose tool

### DESCRIPTION OF DRILL:

This drill should emphasize the proper use of the exhaust fan to exhaust air from a room or building to the outside. Emphasis should be placed on use of equipment to properly hang the fan; safety; and the department's accepted procedure.

### DRILL SETTING:

This drill should be held at the drill ground or a location where an exhaust fan can be used effectively (preferably a room with a doorway and windows). Practices should continue until a level of proficiency is obtained. *If time permits, practices of other ventilating procedures could be conducted.*

## FFI - 10J "VENTILATION USING AN EXHAUST FAN"

### TIME:

1 hour

### OBJECTIVES:

To provide students with the skills necessary to set up and operate exhaust fans during various situations.

### COVERAGE:

Use of an exhaust fan; frame installation; stairwell installation; hall or archway placement; floor opening placement; door casing placement; door placement; window placement; ladder placement; casement windows.

### MATERIALS:

1. Exhaust fan
2. Salvage cover
3. Folding ladder
4. Rope hose tool
5. Smoke bombs

### PREPARATION:

1. Review the following material as you feel necessary:  
--IFSTA 107, Pgs. 115-119
2. Make ready materials
3. Make ready building or room to be filled with smoke

### INTRODUCTION:

Re-emphasize the importance of forced ventilation and explain procedures to be followed during this lesson.

### PRESENTATION:

1. Demonstrate each installation and placement of exhaust fans (IFSTA 107, Pgs. 116-118)
  - A. Frame installation
  - B. Stairwell installation
  - C. Hall or archway placement
  - D. Floor opening placement

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- E. Door casing placement
  - F. Door placement
  - G. Window placement
  - H. Ladder placement
  - I. Casement windows
2. Have student perform each task

**EVALUATION:**

Observation of students during the session; discussion of principles and procedures during and after the class.

**TASK PERFORMANCE:**

Tasks No. 49, 50

## FFI - 11 RESCUE AND BREATHING APPARATUS

FFI - 11A	Introduction - Protective Breathing Apparatus	2 hours
FFI - 11B	Protective Breathing Equipment	2 hours
FFI - 11C	Care and Maintenance of Self-Contained Breathing Equipment	2 hours
FFI - 11D	Breathing Equipment Agility Course	2 hours
FFI - 11E	Other Protection Equipment	2 hours
FFI - 11F	Rescue Knot Procedures; Raising and Lowering Victims	2 hours
FFI - 11G	Search Procedures and Rescue Techniques	2 hours
FFI - 11H	Stretcher Transportation	2 hours
FFI - 11I	Pre-Rescue Planning	2 hours
FFI - 11J	Rescue Situations	2 hours
TOTAL		20 hours

## FFI - 11A "INTRODUCTION - PROTECTIVE BREATHING APPARATUS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Importance of body protection .
- Importance of respiratory protection
- Hazards of the respiratory tract
- Shipping regulations

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 108, Lessons 1 and 2
2. IFSTA 108, Pgs. 3-24
3. IFSTA 206, Pgs. 73-75 (Protective Clothing)
4. IFSTA 109, Pg. 25 (Normal and Induced Breathing)
5. IFSTA 109, Pgs. 149-150 (Dangerous gases)
6. IFSTA 109, Pgs. 149-150 (Carbon Monoxide Poisoning)
7. IFSTA 107, Pgs. 21, 68 (Accumulated Smoke and Gases)

### INSTRUCTOR MATERIALS:

1. Visual aids (respiratory tract and DOT labels)
2. Chalkboard, chalk

### DESCRIPTION OF DRILL:

This drill should emphasize the importance of full body protection; the importance of self-contained breathing apparatus for respiratory protection; gases that are hazardous to the respiratory tract; and the Department of Transportation's shipping regulations.

### DRILL SETTING:

This drill should be held in the classroom. Visual aids should be used to depict key points of this topic.

## FFI - 11A "INTRODUCTION - PROTECTIVE BREATHING APPARATUS"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of breathing apparatus and importance to the welfare of firefighters.

### COVERAGE:

Body protection; primary and secondary functions; rescue incidents and situations; the respiratory tract; respiratory hazards; shipping regulations

### MATERIALS:

1. Visual aids
2. Respiratory tract
3. DOT labels
4. Chalkboard, chalk

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 108, Lessons 1 and 2
  - IFSTA 108, Pgs. 3-24
2. Make ready materials
3. Make ready classroom

### INTRODUCTION:

Read the first two paragraphs on Pg. 3, IFSTA 108. Discuss with your students the importance of this phase of training.

### PRESENTATION:

1. Body protection
  - A. Protective clothing
  - B. Protection of internal organs

2. Primary Functions
  - A. Locating and freeing victims
  - B. Conveying victims to a safe place
  - C. Rendering medical aid
3. Secondary Functions
  - A. Search for bodies in debris
  - B. Remove animals
4. Rescue Incidents and Situations (examples)
  - A. Burning buildings
  - B. Demolished buildings
  - C. Gaseous areas
  - D. Electrical contacts
  - E. Earth openings
  - F. Dangerous articles
  - G. Underwater incidents
  - H. Storms and floods
  - I. Transportation accidents
  - J. Forest and brush fires
  - K. Panics
  - L. Other accidental occurrences
5. Respiratory Tract
  - A. Pharynx
  - B. Tongue
  - C. Larynx
  - D. Trachea
  - E. Bronchi
  - F. Lungs
  - G. Heart
  - H. Diaphragm
6. Rescue Hazards to Rescue Workers
  - A. Smoke (various mixtures of gases)
  - B. Acid gases
    - (1) chlorine
    - (2) hydrogen sulphide
    - (3) Phosgene
  - C. Anesthetic gases and vapors
    - (1) Group I - produces anesthesia but no serious after effects
      - (a) acetylene
      - (b) compressed cooking gases
      - (c) organic vapors (gasoline, chloroform, etc.)
    - (2) Group II - injures body parts
      - (a) methylchloride
  - D. Irritant gases
    - (1) Group I - affects upper respiratory tracts
      - (a) ammonia
    - (2) Group II - affects middle and upper respiratory tracts
      - (a) sulfur dioxide
      - (b) chlorine
    - (3) Group III - affects lungs
      - (a) phosgene
      - (b) nitrous fumes



- E. Asphyxiant gases
  - (1) Group I - mechanically exclude oxygen
    - (a) carbon dioxide
    - (b) methane
  - (2) Group II - unites with red blood cells - prevents oxygen from being utilized
    - (a) carbon monoxide
    - (b) hydrogen cyanide
- 7. DOT Shipping Labels (IFSTA 108, Pgs. 16-24)
  - A. Present and discuss labels
  - B. Discuss placement

EVALUATION:

Through oral or written examination, the student should understand the basic principles covered in this session.

## FFI - 11B "PROTECTIVE BREATHING EQUIPMENT"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Donning facepiece
- Donning harness and task assembly
- Operating principles of demand and pressure demand breathing equipment

Teach the following skills:

- Donning breathing apparatus
  - Coat method (back strap model)
  - Overhead method (back strap model)
- Donning shoulder strap model
- Emergency breathing techniques

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 108, Lesson 3
2. IFSTA 108, Pgs. 25-45

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

Fire Protection Handbook - 14th edition, 9-56 (Respiratory Protective Equipment)

### MATERIALS, EQUIPMENT:

1. Self-contained breathing equipment
2. Full protective clothing
3. Chalkboard, chalk

### DESCRIPTION OF DRILL:

This drill should emphasize the use of protective breathing equipment to include donning the facepiece; donning side shoulder strap model and back strap model using the coat method and overhead method; demonstrating the operating principles of demand and pressure demand breathing equipment; and learning the techniques of emergency breathing practices (buddy breathing).

DRILL SETTING:

This drill should be held in the classroom or other room with adequate space to demonstrate each method of donning breathing apparatus. Each student should practice donning breathing apparatus until an accepted level of proficiency is gained. Buddy breathing techniques should be introduced at this time. Mistakes should be corrected at the time they occur. Training aids are available to cover this topic.

## FFI - 11B "PROTECTIVE BREATHING EQUIPMENT"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of demand and pressure demand breathing equipment and the skills necessary to don them.

### COVERAGE:

Donning facepiece; donning harness and tank assembly; operating principles of demand and pressure demand breathing equipment

### MATERIALS:

1. Self-contained breathing apparatus (one per 2-4 students)
2. Full protective clothing
3. Visual aids (if available)
4. Chalkboard, chalk

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 108, Lesson 3
  - IFSTA 108, Pgs. 25-45
2. Make ready materials
3. Make ready classroom

### INTRODUCTION:

Discuss the necessity to understand and learn skills involved with breathing apparatus. Emphasize the students' safety and safety of rescue victims. Discuss situations where their actions and efficiency could mean life or death.

### PRESENTATION:

Divide students into groups of two or four. After demonstrating the various techniques, have students perform the task.

1. Donning the Facepiece
  - A. Loosening straps
  - B. Placing chin and fitting facepiece
  - C. Pull harness over head
  - D. Tighten chin straps
  - E. Tighten temple straps
  - F. Tighten top strap
2. General Operating Procedures (IFSTA 108, Pg. 28)
  - A. Draw diagram showing
    - (1) cylinder
    - (2) by-pass valve
    - (3) mainline valve
    - (4) pressure gauge
    - (5) reducing valve
    - (6) safety valve
    - (7) admission valve
    - (8) diaphragm
    - (9) facepiece
3. Donning the Side Shoulder Strap Model (procedures as illustrated in IFSTA 108, Pgs. 30-34)
4. Donning Back Strap Model - Coat Method (procedures as illustrated in IFSTA 108, Pgs. 35-38)
5. Donning the Back Strap Model - Overhead Method (procedures as illustrated in IFSTA 108, Pgs. 39-41)
6. Donning Back-Strap Model from Vehicle Mount
7. Necessity for teamwork
  - A. Enter involved area only in pairs
  - B. Maintain communication with each other
8. Limitations of mask
  - A. Check for seal
  - B. Conditions when mask will not protect
9. Buddy Breathing Techniques
  - A. Explain when needed
  - B. Explain techniques
    - (1) with regulator valve
    - (2) with flexible hose
    - (3) importance of timing
    - (4) use with fellow firefighters
    - (5) use with civilians

*Utilize any remaining time to practice skills.*

#### EVALUATION:

1. Observation of students during session.
2. Time students, meeting standards set by your department for donning breathing apparatus.

#### TASK PERFORMANCE:

Task No. 51

NFPA 1001 STANDARD 3-3.2, 3-3.4

**FFI - 11C "CARE AND MAINTENANCE OF SELF-CONTAINED  
BREATHING EQUIPMENT"**

**TIME:**

2 hours

**OBJECTIVES:**

Develop a basic understanding of the following:

- Inspecting self-contained breathing equipment
- Care of self-contained breathing equipment
- Testing self-contained breathing equipment
- Filling cylinders for self-contained breathing equipment

**INSTRUCTOR REFERENCES:**

1. IFSTA Instructor's Guide Sheet 108, Lesson 4
2. IFSTA 108, Pgs. 45-49

**MATERIALS, EQUIPMENT:**

Self-contained breathing equipment, demand or pressure demand

**INSTRUCTOR MATERIALS:**

1. Visual aids
2. Chalkboard, chalk

**DESCRIPTION OF DRILL:**

This drill should emphasize the inspection, care, and testing of self-contained breathing equipment. This would include testing by-pass valve, regulator shut-off valve and cylinder valve for leaks; checking facepieces, hoses, harness, regulators, and gauges for serviceability. The correct procedure for filling cylinders with cascade system should be emphasized.

**DRILL SETTING:**

This drill should be held in the classroom or any suitable location close to cascade system if available. The instructor should demonstrate all care and maintenance of breathing equipment and also in filling cylinders. Each student should be familiar with the care and maintenance of breathing equipment and filling cylinders by actual practice.

**FFI - 11C "CARE AND MAINTENANCE OF SELF-CONTAINED  
BREATHING EQUIPMENT"**

**TIME:**

2 hours

**OBJECTIVES:**

To provide the student with a basic understanding of care and maintenance of self-contained breathing apparatus.

**COVERAGE:**

Inspecting self-contained breathing equipment; care of self-contained breathing apparatus; testing self-contained breathing equipment; filling cylinders for self-contained breathing equipment

**MATERIALS:**

1. Visual aids (if available)
2. Breathing apparatus (one complete unit)
3. Chalkboard, chalk

**PREPARATION:**

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 108, Lesson 4
  - IFSTA 108, Pgs. 46-49
2. Make ready materials
3. Make ready classroom

**INTRODUCTION:**

Discuss with your students the importance of proper care and maintenance of self-contained breathing apparatus. Emphasize the fact that you literally put your life in the hands of this piece of equipment while performing in various situations. Share experiences which you or your students have had to substantiate this fact.

**PRESENTATION:**

1. Visual Inspection (Weekly) - Demonstrate Procedures:
  - A. Check condition of carrying device
  - B. Check equipment to see if it is complete
  - C. Check cylinder pressure
  - D. Cleaning after each use according to manufacturer's instructions
2. Quarterly Inspection (IFSTA 108, Pg. 47) - Check:
  - A. Valves
  - B. Pressure regulator
  - C. Gauges
  - D. Harness
  - E. Facepiece
3. After Two and One Half Years - Test and/or Repair:
  - A. Regulator
  - B. Regulator hose
4. Five-Year Inspection - Hydrostatically Test Cylinders
5. Method of Filling Cylinders (read procedures in IFSTA 108, Pgs. 48-49)

*Utilize remaining time to practice skills learned in previous lesson (donning breathing apparatus).*

**EVALUATION:**

Ask questions regarding procedures about items covered.

**TASK PERFORMANCE:**

Task No. 52



## FFI - 11D "BREATHING EQUIPMENT AGILITY COURSE"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding and skill in the following:

- Donning breathing equipment
- Working with breathing equipment
- Refilling cylinders

### INSTRUCTOR REFERENCES:

IFSTA 108, Pgs. 25-49

### MATERIALS, EQUIPMENT:

1. Breathing equipment
2. Extra cylinders
3. Breathing apparatus wrenches
4. Stop watch (optional)

### DESCRIPTION OF DRILL:

Review use of breathing equipment. Divide class into two-man teams. Each team should have one set of breathing equipment with one spare bottle. One team member from each team will mount the equipment and run an obstacle course in a "follow-the-leader" manner creating an exhausting atmosphere. When the warning bell rings on the bottle he will return to his partner, change bottles and return to obstacle course. The second team member can refill the first bottle while the second bottle is being used. Repeat drill with team members changing assignments. If time permits, use this period also for training in emergency breathing practices (buddy breathing). Use future training sessions to improve skills and develop proficiency in avoiding or thinking one's way out of a disoriented or panic situation.

### DRILL SETTING:

This drill should be held at the training ground or suitable area near cascade system if possible.

## FFI - 11D "BREATHING EQUIPMENT AGILITY COURSE"

### TIME:

2 hours

### OBJECTIVES:

To develop acceptable skills in donning, working with, and refilling cylinders

### COVERAGE:

Donning breathing apparatus; working with breathing apparatus; refilling cylinders

### MATERIALS:

1. Breathing equipment (one per two students)
2. Extra cylinders (one per two students)
3. Breathing apparatus wrenches
4. Stop watch (optional)

### PREPARATION:

1. Review the following material as you feel necessary:  
--IFSTA 108, Pgs. 25-49
2. Make ready materials
3. Make ready obstacle course

### INTRODUCTION:

Discussion with your students situations whereby it is necessary to perform duties with breathing apparatus under stress conditions, and change bottles, returning to work. Explain procedures to be followed. Explain good practices to be used in a panic situation.

### PRESENTATION:

1. Review donning procedures
2. Divide firefighters into teams of two
3. Explain obstacle course (demonstrate)
  - A. Don apparatus
  - B. Run obstacle course (until air supply is depleted)
  - C. Change bottles
  - D. Repeat obstacle course

4. Send first group through course
5. Change group positions and repeat operation

*You may want to time each firefighter, making the session competitive in nature.  
Spend remaining time practicing the tasks.*

**EVALUATION:**

Observe students during session.

**TASK PERFORMANCE:**

Task No. 53

## FFI - 11E "OTHER EQUIPMENT"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Standard protective clothing
- Special protective clothing
- Rope guide lines
- Radiation detection devices
- Ambulance and rescue equipment
- Explosion and gas meters

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 108, Lesson 6
2. IFSTA 108, Pgs. 3, 59-62
3. IFSTA 206, Pgs. 73-75 (Protective Clothing)
4. IFSTA 101, Pg. 84 (Forcible Entry Cautions and Procedures)
5. IFSTA 101, Pg. 100 (Fire Service Ropes and Knots)
6. IFSTA 109, Pgs. 191-212 (Short Distance Transfer of Patients)
7. IFSTA 108, Pgs. 25-58 (Protective Breathing Equipment)
8. IFSTA 108, Pgs. 59-60 (Protective Clothing)
9. IFSTA 108, Pg. 4 (Body Protection)
10. IFSTA 206, Pgs. 73-74 (Types of Protective Clothing)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. NFPA 403-491 (Types of Protective Clothing)
2. NFPA 402-404 (Protective Clothing)

### MATERIALS, EQUIPMENT:

1. Full set of protective clothing (Standard and Special)
2. Self-contained breathing apparatus
3. 125-foot rope
4. Dosimeter
5. Survey meter

### DESCRIPTION OF DRILL:

This drill should emphasize full protective clothing; other protective clothing used for aircraft emergencies; how rope guide lines are used; and radiation detection devices.

**DRILL SETTING:**

This drill could be held in the classroom or at a large enough space to crawl around with rope guide lines. The instructor should demonstrate and familiarize the students with radiation detection devices. If time permits, practice sessions could be set up for the students to gain proficiency in donning breathing apparatus.

## FFI - 11E "OTHER EQUIPMENT"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of protective equipment, rope guide lines, radiation detection devices, ambulance and rescue equipment, and explosion and gas meters.

### COVERAGE:

Standard protective clothing; special protective clothing; rope guide lines; radiation detection devices; ambulance and rescue equipment; explosion and gas meters.

### MATERIALS:

1. Full set of protective clothing
2. Self-contained breathing apparatus
3. 125-foot rope
4. Dosimeter
5. Survey meter
6. Ambulance or rescue unit

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 108, Lesson 6
  - IFSTA 108, Pgs. 3, 58-64
2. Make ready materials
3. Make ready classroom

### INTRODUCTION:

Emphasize the importance of special fire service equipment, discussing the importance of utilizing all equipment provided to protect you against injury, and to assist in your work.

### PRESENTATION:

1. Protective Clothing
  - A. Display and demonstrate
    - (1) helmet
    - (2) coat
    - (3) pants
    - (4) boots
    - (5) gloves

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*Provide students with specifications of equipment if available. Include what the article protects; purpose for design; material of construction; heat resistance; etc.*

2. Special Protective Clothing
  - A. Display and demonstrate
    - (1) Entry suits
    - (2) Scuba diving suit
    - (3) Other clothing utilized in your department
3. Rope Guide Lines
  - A. Signals - demonstrate
    - (1) One (1) tug - means OK
    - (2) Two (2) tugs - means allow slack
    - (3) Three (3) tugs - means take up slack
    - (4) Four (4) tugs - means HELP
  - B. Have students practice signals (groups of two)
    - (1) Attach ropes
    - (2) Provide dark area
    - (3) Have students crawl and signal partner
4. Radiation Detection Devices
  - A. Demonstrate and Explain
    - (1) Dosimeter
    - (2) Survey meter
    - (3) Explosion and gas meters
  - B. Have students work with detection devices
5. Ambulance Equipment
  - A. Demonstrate ambulance and equipment
  - B. Have students handle equipment

**EVALUATION:**

Through oral or written examination, students should understand the basic principles of this lesson and the uses of the various equipment.

**TASK PERFORMANCE:**

Task No. 56

## FFI - 11F "RESCUE KNOTS; RAISING AND LOWERING VICTIMS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Rescue knots
- Lowering victim
- Raising victim

Teach the following skills:

- Bowline-on-a-bight
- Double bowline
- Butterfly knot
- Lowering and raising victim - horizontal position
- Lowering and raising victim - vertical position

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 108, Lesson 7
2. IFSTA 108, Pgs. 65-92
3. IFSTA 101, Pgs. 89-99 (Fire Service Ropes)
4. IFSTA 101, Pgs. 105-107 (Bowline Knot)

### INSTRUCTOR MATERIALS:

1. 10-foot rope (one for each student)
2. 125-pound dummy

### MATERIALS, EQUIPMENT:

1. 24-foot extension ladder (or longer)
2. 125-foot rope
3. Stretcher

### DESCRIPTION OF DRILL:

This drill should emphasize the proper tying of knots used in rescue operations and the proper procedure in raising or lowering a victim in the horizontal position and the vertical position.



DRILL SETTING:

This drill should be held at the training grounds or any building suitable for laddering. Each student should practice tying the different knots required before actual rescue practice begins. A person or a training dummy may be used in raising or lowering victim. Victim should be raised or lowered from a height or depth of at least 20 feet.

## FFI - 11F "RESCUE KNOTS; RAISING AND LOWERING VICTIMS"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of rescue knots and related skills necessary to lower victims.

### COVERAGE:

Bowline-on-a-bight; double bowline; butterfly knot; raising and lowering victims - horizontal position; raising and lowering victims - vertical position.

### MATERIALS:

1. 10-foot rope (one for each student)
2. Two 125-foot ropes
3. 125-lb dummy
4. 24-foot extension ladder (or longer)
5. Stretcher

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 108, Lesson 7
  - IFSTA 108, Pgs. 65-92
  - IFSTA 101, Pgs. 89-99 (Fire Service Ropes)
  - IFSTA 101, Pgs. 105-107 (Bowline Knot)

### INTRODUCTION:

Discuss the importance of possessing efficient skills in rescue knots and operations. Emphasize that there may come a time when a knot you tie may mean life or death for a victim.

### PRESENTATION:

Demonstrate the following knots and techniques. Then have students perform the task.

1. Rescue Knots (IFSTA 108, Pgs. 65-76)
  - A. Bowline-on-a-bight
  - B. Double bowline
  - C. Butterfly knot
2. Raising and Lowering Victims (IFSTA 108, Pgs. 75-92)
  - A. Horizontal position (IFSTA 108, Pgs. 77-80)
  - B. Vertical position (IFSTA 108, Pgs. 81-82)
3. Devices Used in Raising and Lowering
  - A. Demonstrate items used in your department
  - B. Have students perform the tasks

**EVALUATION:**

1. Observation of students during session.
2. Have students demonstrate their ability to tie and utilize knots covered in this lesson.

*Additional sessions should be scheduled to increase efficiency.*

**TASK PERFORMANCE:**

Tasks No. 10, 22, 54

## FFI - 11G "SEARCH PROCEDURES AND RESCUE TECHNIQUES"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Search procedures as determined by the department having jurisdiction
- Assisting a victim
- Carrying a victim
- Dragging a victim

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 108, Lesson 8
2. IFSTA 108, Pgs. 93-107
3. Brady Transparencies, Unit 20 - Fireground Search and Rescue

### INSTRUCTOR MATERIALS:

1. 125-lb training dummy (optional)
2. Ropes
3. Mattress
4. 1 1/2-inch or 2 1/2-inch hose

### MATERIALS, EQUIPMENT:

24-foot extension ladder (or longer)

### DESCRIPTION OF DRILL:

This drill should emphasize the department standard operating procedures for search, and the various assists, carries, and drags used in the fire service in rescuing and handling victims.

### DRILL SETTING:

This drill should be held at the training grounds or any building suitable for laddering. Most procedures would have students working as part of a team.

## **FFI - 11G "SEARCH PROCEDURES AND RESCUE TECHNIQUES"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of search procedures and assisting, carrying, and dragging victims.

### **COVERAGE:**

Searching an area for victims; assisting a victim to walk; assisting a victim down a ladder; carrying a victim; dragging a victim.

### **MATERIALS:**

1. 125-lb. training dummy
2. Ropes
3. Mattress
4. 1 1/2-inch or 2 1/2-inch hose
5. 24-foot extension ladder (or longer)
6. Breathing apparatus
7. Full protective clothing for all participants

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - Your departmental procedures for conducting search operations in a hazardous environment
  - IFSTA Instructor's Guide Sheet 108, Lesson 8
  - IFSTA 108, Pgs. 93-107
  - Brady Transparencies, Unit 20
2. Make ready materials
3. Make area suitable to ladder and perform tasks

### **INTRODUCTION:**

Discuss the necessity of having procedures for searching systematically and thoroughly for victims; discuss the importance of assisting, carrying and dragging victims. Emphasize situations where quick action and knowledge would be necessities with regard to the welfare of the victim.

**PRESENTATION:**

Describe in detail the procedures used in your department to search a particular area for a victim. Demonstrate the procedures so that each student may see that every inch of space is searched systematically and swiftly.

1. Considerations in size-up
  - A. Information received at time of alarm
  - B. Time of day as related to occupancy
  - C. Size and type of occupancy
2. Begin search
  - A. In rooms adjoining fire
  - B. In area directly over fire
3. Establish search pattern
  - A. Right hand pattern throughout search
  - B. Left hand pattern throughout search
  - C. Entry and exit through same door
  - D. Ventilation throughout if time permits
  - E. Close door on fire to isolate if possible
  - F. Identify searched room by chair on side in doorway or other signal
  - G. Do not kick or force a door - victim might be behind
  - H. Use tool for probing - carefully
  - I. Key search locations
    - (1) under windows, behind drapes
    - (2) under and behind furniture
    - (3) on, under and between beds
    - (4) closets
    - (5) bathroom - tub and behind shower curtain
    - (6) hidden areas - children tend to hide
4. Search for extension of fire and interior/exterior exposures
  - A. walls
  - B. interior shafts
  - C. air shafts for extension to exposures
5. Communications
  - A. Keep in touch with fellow searchers
  - B. Keep in touch with officers in command
  - C. Communicate what you do and do not find

In the following rescue techniques, first demonstrate the methods used, then have students perform the task:

1. Assisting a Victim to Walk (IFSTA 108, Pgs. 93, 94)
  - A. One-man method
  - B. Two-man method
2. Assisting a Victim Down a Ladder (IFSTA 108, Pgs. 94-95)
3. Carrying a Victim (IFSTA 108, Pgs. 95-100)
  - A. The pack-strap crawl and carry (one-man)
  - B. The seat carry (two-man)
  - C. The arm cradle carry (one-man)
  - D. The astride back carry (one-man)
  - E. The extremities carry (two-man)
  - F. The chair carry (two-man)
  - G. The three-man carry

4. Dragging a Victim (IFSTA 108, Pgs. 101-106)
- A. Incline drag
  - B. Mattress splint drag
  - C. The firemen's drag
  - D. The blanket drag
  - E. The ladder float drag

EVALUATION:

Observe students during the session.

TASK PERFORMANCE:

Tasks No. 19, 55, 56

## FFI - 11H "STRETCHER TRANSPORTATION"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Lifting a victim, placing victim on a stretcher and carrying a stretcher

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 108, Lesson 9
2. IFSTA 108, Pgs. 108-116
3. IFSTA 109, Pg. 112 (Placing a Victim on a Stretcher)

### MATERIALS, EQUIPMENT:

1. Pike poles
2. Blankets or sheets
3. Rope
4. Stretcher
5. Backboards

### DESCRIPTION OF DRILL:

This drill should emphasize the proper procedure in placing a victim on a stretcher and properly carrying a stretcher.

### DRILL SETTING:

This drill should be held at the training ground or any location with adequate space to perform the required tasks. There should be obstacles to carry stretcher around and over. Class should be divided into two- and four-man teams.



## FFI - 11H "STRETCHER TRANSPORTATION"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of how to lift victims, how to place them on stretchers, and how to carry a loaded stretcher.

### COVERAGE:

Placing a victim on a stretcher; carrying a stretcher; improvised stretchers

### MATERIALS, EQUIPMENT:

1. Pike poles
2. Blankets or sheets
3. Rope
4. Stretcher
5. Backboards

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 108, Lesson 9
  - IFSTA 108, Pgs. 108-116
2. Make ready materials
3. Make area suitable for lifting and carrying victims.  
(Provide students with an obstacle course to carry victims.)

### INTRODUCTION:

Discuss the importance of proper lifting and carrying of victims. Emphasize the potential danger of further injury to a victim and/or rescuer if proper procedures are not followed.

### PRESENTATION:

1. Improvised Stretchers (IFSTA 108, Pgs. 108-109)
  - A. Demonstrate how to make stretcher using:
    - (1) Pike Poles
    - (2) Blanket
  - B. Have students perform the task

2. Placing a Victim on a Stretcher (IFSTA 108, Pg. 109)
  - A. Divide students into groups of three
  - B. Demonstrate
    - (1) lifting victim
    - (2) placing victim on stretcher
  - C. Have students perform the task
3. Carrying a Victim (IFSTA 108, Pgs. 110-111)
  - A. Divide students into groups of four
  - B. Demonstrate carry
  - C. Have students carry stretcher through obstacle course

*If time permits, review previous lessons on lifts and carries.*

**EVALUATION:**

Observation of students during the session.

**TASK PERFORMANCE:**

Task No. 57

## FFI - 111 "PRE-RESCUE PLANNING"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Sizing up rescue situation
- Determining procedures
- Locating and reaching victims
- Conditions where victims may be found
- Caring for and releasing a victim

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 108, Lesson 10
2. IFSTA 108, Pgs. 119-126
3. IFSTA 107, Pg. 5 (Aids Life Saving and Rescue)
4. IFSTA 107, Pg. 77 (Performing Rescue Work)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition
  - 9-45 (Rescue Truck)
  - 9-53 (Rescue Equipment on Trucks)
  - 9-51 (Aircraft Rescue)

### INSTRUCTOR MATERIALS:

1. Visual aids
2. Chalkboard, chalk

### DESCRIPTION OF DRILL:

This drill should emphasize how to size up a rescue situation; determining proper procedures; how to locate and reach a victim; conditions where victims may be found; caring for and releasing a victim.

### DRILL SETTING:

This drill should be held in the classroom. Visual aids should be used to depict key points. Students should be able to discuss each situation presented. The instructor should be familiar with the following IFSTA manuals:

- IFSTA 109 "Fire Service First Aid Practices"
- IFSTA 206 "Aircraft Fire Protection and Rescue Procedures"
- IFSTA 302 "Fire Department Facilities, Planning and Procedures"

## FFI - 111 "PRE-RESCUE PLANNING"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of pre-rescue planning.

### COVERAGE:

Sizing up rescue situation; determining procedures; locating and reaching victim(s); conditions where victims may be found; caring for and releasing a victim

### MATERIALS:

1. Visual aids (if available)
2. Chalkboard, chalk
3. Dummy

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 108, Lesson 10
  - IFSTA 108, Pgs. 119-126
2. Make ready materials
3. Make ready classroom

### INTRODUCTION:

Discuss the importance of quick; proper decision-making when dealing with rescue operations and removing victims from hazardous situations. Reemphasize the fact that rescue has first consideration.

### PRESENTATION:

1. Sizing up a Rescue Situation
  - A. Continually evaluate existing conditions
    - (1) weigh the facts
    - (2) make a decision
    - (3) determine procedure
2. Determining Procedure
  - A. Go over "system of survey" (IFSTA 108, Pg. 120)
    - (1) initial decision
    - (2) supplemental decisions

3. Locating and Reaching Victim(s)
  - A. Rescue victims who can be seen and heard
  - B. Avoid indiscriminate movement in rescue area
  - C. Arrange rescuers around perimeter
  - D. Progress toward center
  - E. Maintain silence
  - F. Obtain a position "fix"
  - G. Anticipate actions of victim(s)
  - H. Select method and technique of removal
4. Have Class Search for Victim(s)
5. Conditions in Which Victims May Be Found
  - A. Trapped victim
  - B. Pinned victim
  - C. Injured victim
  - D. Burned victim
  - E. Unconscious victim
  - F. Victim in shock
  - G. Sleeping victim
  - H. Intoxicated victim
  - I. Bedfast victim
  - J. Panicky victim
6. Caring for and Releasing Victim
  - A. First aid theory and practice
  - B. Proper victim handling (previous lessons)
  - C. Define purpose of rescue work
  - D. Summarize

EVALUATION:

Through oral or written examination, students should understand the basic principles taught in this lesson.

## FFI - 11J "RESCUE SITUATIONS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Rescue from burning buildings
- Rescue from demolished building
- Rescue from gaseous areas
- Rescue from electrical contact
- Rescue from earth openings
- Rescue from under water
- Rescue from storms and floods
- Rescue from transportation accidents
- Rescue from forest and brush fires
- Rescue from panics
- Rescue from aircraft
- Rescue from other accidental occurrences

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 108, Lesson 11
2. IFSTA 108, Pgs. 127-144
3. IFSTA 101, Pg. 131 (Forcible Entry - Requirements for Burning)
4. IFSTA 206, Pgs. 215, 229 (Aircraft Rescue)

### INSTRUCTOR MATERIALS:

1. Visual aids
2. Chalkboard, chalk

### DESCRIPTION OF DRILL:

This drill should emphasize the different hazards and techniques required in conducting a rescue operation under various circumstances.

### DRILL SETTING:

This drill should be held in the classroom. Visual aids should be used to depict different rescue situations. The students should be able to discuss each situation presented.

## FFI - 11J "RESCUE SITUATIONS"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of procedures involved in various types of rescues.

### COVERAGE:

Rescue from burning building; rescue from demolished building; rescue from gaseous areas; rescue from electrical contact; rescue from earth openings; rescue from underwater; rescue from storms and floods; rescue from transportation accidents; rescue from forest and brush fires; rescue from panics; rescue from aircraft; rescue from other accidental occurrences

### MATERIALS:

1. Visual aids (if available)
2. Chalkboard, chalk

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 108, Lesson 11
  - IFSTA 108, Pgs. 127-144
2. Make ready materials
3. Make ready classroom

### INTRODUCTION:

Discuss the necessity of knowing basic principles involved in various types of rescues. Emphasize the importance of group participation during this lesson.

### PRESENTATION:

1. Rescue from Burning Building
  - A. Rescuer protection
    - (1) clothing
    - (2) hose line(s)
  - B. Communication between rescue teams
    - (1) life lines
    - (2) radios
    - (3) vocal

- C. Situation complicated at night
  - (1) visual contact difficult
  - (2) obstacles
- D. Complications of crowds and unfamiliar facility
- E. Fire escapes
  - (1) access
  - (2) location
- F. Victims not ambulatory
- 2. Rescue from Demolished Building
  - A. Immediate rescue of free and lightly trapped
  - B. Rescue of heavily trapped
  - C. Collapse of bearing walls
    - (1) effect on victims
    - (2) danger to rescuers
    - (3) type of collapse (discuss)
- 3. Rescue from Gaseous Areas
  - A. Personal protection
  - B. Types of hazardous gases
    - (1) industrial gases - fumigants, anesthetics, etc.
    - (2) fire gases - smoke, carbon dioxide, carbon monoxide, etc.
    - (3) gases from decomposition - ammonia, hydrogen sulfide, etc.
  - C. Precautions
    - (1) use gas indicator
    - (2) stop gas leaks
    - (3) no smoking or open flames
    - (4) do not attempt to extinguish burning gas
    - (5) use breathing apparatus
- 4. Rescue from Electrical Contact
  - A. Personal protection
  - B. Detaching victim
  - C. Making hot wire safe
  - D. Utilities personnel responsibilities
  - E. Tools and equipment employed
- 5. Rescue from Earth Openings
  - A. Rescuer protection
  - B. Means of entry
  - C. Shoring and cribbing
- 6. Rescue from Underwater
  - A. Search by divers
  - B. Dragging
  - C. Responsible agencies
- 7. Planning
  - A. Coordination between agencies
    - (1) disaster plan(s)
    - (2) agreements
  - B. Volunteers
    - (1) value
    - (2) availability
  - C. By-standers
  - D. The value of witnesses
- 8. Other Incidents
  - A. Discuss
  - B. Plan



EVALUATION:

Through written or oral examination, students should understand the basic principles presented in this lesson.

TASK PERFORMANCE:

Tasks No. 19, 58

## FFI - 12 FIRE PREVENTION AND INSPECTION PRACTICES

FFI - 12A	Introduction to Fire Prevention	2 hours
FFI - 12B	Fire Safety Education Programs	4 hours
FFI - 12C	Building Construction and Structural Features Which Influence Fire Spread and Safety	2 hours
FFI - 12D	Fire Inspection Techniques and Procedures	2 hours
FFI - 12E	Company and Special Inspections	2 hours
FFI - 12F	Fire Investigation and Reporting	4 hours
FFI - 12G	Recognizing and Preserving Evidence of Arson	<u>2 hours</u>
TOTAL		18 hours

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## FFI - 12A "INTRODUCTION TO FIRE PREVENTION"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Purpose and objectives of fire prevention and a fire prevention bureau
- Fire prevention activities and programs

### INSTRUCTOR REFERENCES:

1. IFSTA 110, Pgs. 1-20
2. Introduction to Fire Prevention, by James Robertson
3. Fundamentals of Fire Prevention, by William Bare

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition
  - 9-29 (Fire Prevention Activities and Fire Marshals)
  - 9-30 (Fire Prevention Programs)
  - A-24 (List of Agencies)
  - A-1 (How NFPA Fire Protection Standards are Prepared)

### DESCRIPTION OF DRILL:

This drill should emphasize the purpose and objectives of fire prevention and a fire prevention bureau.

### DRILL SETTING:

This drill should be held in the classroom. There are training aids and film that can be used to supplement this topic. A Fire Marshal might be available to speak on this topic.

## FFI - 12A "INTRODUCTION TO FIRE PREVENTION"

### TIME:

2 hours

### OBJECTIVES:

To provide firefighters with an understanding of the importance of fire prevention and related activities.

### COVERAGE:

Purpose and scope; definitions; legal aspects; The Three "E's" of Fire Prevention Activities; Managing a Fire Prevention Bureau

### MATERIALS:

1. Chalkboard, chalk
2. Course outline

### REFERENCES:

Review the following material as you feel necessary:

1. IFSTA 110, Pgs. 1-20
2. Introduction to Fire Prevention, by James Robertson
3. Fundamentals of Fire Prevention, by William Bare

### PREPARATION:

1. Make ready materials
2. Make ready classroom area
3. Review reference material
4. Review the content of this lesson

### INTRODUCTION:

Fire is one of the most difficult things to control, despite man's increased ability to create and manage his built environment. Fire uncontrolled has the power to charm a person into stunned disbelief, then fear, then panic, and perhaps to injury and death. The understanding of fire, its causes and its effects on buildings and people, and the importance of fire prevention are necessary for a good fire prevention program. Armed with this knowledge, you will be able to educate the public, to understand the basis for laws, regulations, and standards, and to appreciate the importance of good building construction and fire protection systems.

**PRESENTATION:**

1. Introduction to Fire Prevention
  - A. Purpose and Scope
    - (1) present you with proper prevention practices
    - (2) to up-grade quality of inspections
    - (3) to standardize fire prevention activities
  - B. Definitions
    - (1) Inspection - a close and critical examination by a competent authority
    - (2) Inspector - a competent person who inspects
    - (3) A Fire Prevention Officer
      - (a) conducts examinations to eliminate hazards
      - (b) reduces findings to written form
      - (c) serves as a consultant
      - (d) serves as public relations officer
      - (e) examines plans for new construction
    - (4) Fire Company Inspection
      - (a) conducts inspections to eliminate hazards
      - (b) collects information for pre-fire plans
      - (c) familiarizes self and company with buildings
      - (d) informs and educates people
      - (e) improves public relations
  - C. Legal Aspects
    - (1) National laws (codes)
    - (2) State laws (codes)
    - (3) Local ordinances
    - (4) "The right to inspect"
      - (a) schedule inspections.
      - (b) may enter building without permission if there is reason to suspect an immediate fire menace.
  - D. The Fire Prevention Bureau
    - (1) a staff function (illustrate your organizational structure and how prevention bureau fits in)
    - (2) works in close harmony with suppression division
  - E. The Elements of Fire Prevention
    - (1) Education
      - (a) promotion of fire safe attitudes and behavior
      - (b) participation with other agencies and organizations in public education
      - (c) program development, implementation and evaluation.
    - (2) Engineering (plan reviews for)
      - (a) building design and construction
      - (b) fire protection and alarm systems
      - (c) water supply networks
    - (3) Inspection
      - (a) to discover and eliminate hazards
      - (b) responsibility and authority
    - (4) Investigation
      - (a) to determine cause and place responsibility
      - (b) to identify recurring hazards

**F. Managing a Fire Prevention Bureau**

- (1) responsibility
  - (a) supervision of prevention activities
  - (b) development, interpretation, and enforcement of fire prevention codes and ordinances
  - (c) participation of prevention education programs
  - (d) promotes good public relations
  - (e) investigates fire incidents
  - (f) maintains files, records, reports, maps
  - (g) maintenance of a reference library
- (2) Supervision
  - (a) orients personnel
  - (b) assigns duties
  - (c) schedules work
  - (d) maintains a cooperative work force
  - (e) trains personnel
  - (f) rates personnel

**SUMMARY:**

Review the contents of this lesson with your firefighters, answering any questions they might have.

**EVALUATION:**

Develop and administer a written or oral examination covering the material presented in this lesson.

## **-FFI - 12B "FIRE SAFETY EDUCATION PROGRAMS"**

### **TIME:**

4 hours

### **OBJECTIVES:**

To develop a basic understanding of fire safety education programs and agencies responsible to the public.

### **INSTRUCTOR REFERENCES:**

1. "Five-step Systematic Planning" manual and slide/tape program, Public Education Office, USFA (SFMQ)
2. IFSTA 110, Pgs. 21-26
3. Fire safety education programs of the authority having jurisdiction

### **DESCRIPTION OF DRILL:**

This drill should emphasize education programs for school and community; related organizations and agencies and their responsibilities; responsibility of local fire departments.

### **DRILL SETTING:**

This drill should be held in the classroom. A fire inspector, fire prevention officer, or fire marshal may be available to speak on this topic.

## FFI - 12B "FIRE SAFETY EDUCATION PROGRAMS

### TIME:

4 hours

### OBJECTIVE:

To provide firefighters with a basic understanding of public education programs and responsible agencies.

### COVERAGE:

Systematic planning; promotional activities; industrial or functional activities; monthly fire safety campaigns; Boy Scout-Girl Scout programs; school programs; Sparky, Smokey Bear, and Jr. fire marshal programs; community youth organizations; baby-sitter programs; service, fraternal, and social clubs; National Fire Prevention Week; use of news media; annual fire prevention competition

### PREPARATION:

1. Review the following materials as you feel necessary:
  - "Five-Step Systematic Planning" manual and slide/tape program (SFM0)
  - IFSTA 110, Pgs. 21-26
  - Department fire safety education program
2. Make ready materials
3. Make ready classroom

### INTRODUCTION:

Probably one of the most important aspects of fire protection is its relationship with its public. Through fire prevention education programs and inspection programs we allow ourselves the opportunity to build a lasting relationship with our public. To take full advantage of such programs is to provide our citizens with excellent fire service in the area of fire prevention.

### PRESENTATION:

1. Fire Prevention Education Program
  - A. Five-Step planning and its importance in the public education process
    - (1) identification of problem
    - (2) selection of treatments
    - (3) design of program
    - (4) implementation of program
    - (5) evaluation

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- B. Importance of directing effort at specific problem areas; one problem at a time; continuity of public education efforts, not just once a year during Fire Prevention Week
  - C. Utilization of community resources; Public Fire Education Committees; need for grass roots support
2. Present "Five-Step Systematic Planning" program

SUMMARY:

Public fire education is the single most important element in reducing our fire losses, more so than suppression, inspections, investigations, etc. Effective public education will not only reduce fire losses, but will build a lasting image for your fire department.

EVALUATION:

Assign each student a specific fire problem and have him/her outline a five-step plan for that problem.

Ex: -children playing with matches  
-smoking in bed  
-disposal of smoking materials in waste baskets in an office building

FFI - 12C "BUILDING CONSTRUCTION AND STRUCTURAL  
FEATURES WHICH INFLUENCE FIRE SPREAD AND SAFETY"

TIME:

2 hours

OBJECTIVES:

To provide firefighters with a basic understanding of the following construction:

- Types of construction
- Fire resistive requirements of construction
- Safety features which restrict spread of fire

INSTRUCTOR REFERENCES:

1. IFSTA 110, Pgs. 89-109
2. Uniform Building Code, 1979 edition, chapters 18-22, or building code mandated by authority having jurisdiction

SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

- 1 NFPA National Fire Codes, 1975, Vol. 7

INSTRUCTOR MATERIALS:

1. Chalkboard, chalk
2. Visual aids as available

DESCRIPTION OF DRILL:

This drill should emphasize the ability to recognize various kinds of construction and their fire-resistive qualities; the structural elements which control or restrict spread of fire; the structural means used to allow safe escape from a fire situation.

DRILL SETTING:

This drill should be conducted in the classroom. This class might well be taught by someone in the field of construction or engineering.

## FFI - 12C "BUILDING CONSTRUCTION AND STRUCTURAL FEATURES WHICH INFLUENCE FIRE SPREAD AND SAFETY"

### TIME:

2 hours

### OBJECTIVE:

To provide firefighters with a basic understanding of building construction and those features of buildings which influence fire spread and safety.

### COVERAGE:

Fire resistive construction; non-combustible construction; heavy timber construction; ordinary construction; wood frame construction; fire walls and partitions; fire doors; fire windows and fire shutters; curtain boards; venting devices; fire exits and escapes; fire and smoke dampers; fire stops.

### MATERIALS:

1. Chalkboard, chalk
2. Visual aids, if available

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA 110, Pgs. 89-95
  - Uniform Building Code, 1979 edition, Ch. 18-22, or that code mandated by the authority having jurisdiction
2. Make ready materials and visual aids
3. Make ready classroom
4. Make arrangements to tour buildings of various types

### INTRODUCTION:

Remind your people that no material is immune to damage by severe or prolonged heat. A building is designed on the drafting board to meet the specifications that have been established for it. It is during this stage of development that engineering concepts are applied to insure that a safe structure will be built. Inferior construction, unprotected openings, excessive areas, and inoperative fire doors are the main structural features which contribute to the spread of fire. To be knowledgeable of such features is to possibly avoid a major fire loss in your community.

PRESENTATION:

1. Types of construction

A. Fire resistive construction: UBC Type I F.R., II F.R.

(1) constructed of non-combustible:

- (a) walls
- (b) partitions
- (c) columns
- (d) floors
- (e) roof

(2) structural members have various ratings by hour of fire resistance (2, 3, and 4 hour ratings)

B. Non-combustible construction: UBC Type II 1-Hr, II N

- (1) steel
- (2) iron
- (3) brick
- (4) tile
- (5) concrete
- (6) slate, etc.

C. Heavy timber construction: UBC Type IV HT

(1) (read pages 94-95, A-E, under "Heavy timber construction")

D. Ordinary construction: UBC Type III 1-Hr, III N

- (1) bearing walls of 2-hour resistance
- (2) stable under fire conditions

E. Wood frame construction: UBC Type V 1-Hr, V N

- (1) combustible materials
- (2) does not qualify under heavy timber or ordinary construction

2. Structural features which influence fire spread and safety.

A. Fire walls and partitions

- (1) constructed to prevent spread of fire
- (2) fire walls
  - (a) non-combustible material
  - (b) 4-hour fire-resistive rating
  - (c) continuous from foundation to above roof
  - (d) thickness determined by code
- (3) fire partitions
  - (a) non-combustible or protected combustible

B. Fire wall and fire partition openings

- (1) Class "A" openings - 3-hour rating
- (2) Class "B" openings - 1 to 1½-hour rating
  - vertical enclosures (stairs, elevators)
- (3) Class "C" openings - ¾-hour rating
  - in corridors or room partitions
- (4) Class "D" openings - 1½-hour rating
  - exterior wall doors
- (5) Class "E" and "F" openings - ¾-hour rating
  - exterior wall doors

C. Fire doors

D. Fire windows and fire shutters

E. Curtain boards (draft curtains)

F. Venting devices (smoke and heat)

- (1) complement and supplement other devices
- (2) especially important in high hazard occupancies

- G. Fire exits and escapes
- H. Fire and smoke dampers
  - (1) used to avoid the possibility of ducts spreading fire and smoke
  - (2) usually automatic
- I. Fire stops

APPLICATION:

Have firefighters identify several occupancies of various construction in the local area.

SUMMARY:

Discuss various types of construction and fire resistive features with your firefighters, answering any questions they might have regarding this session.

EVALUATION:

Develop and administer a written or oral examination covering the material presented in this lesson.

## FFI - 12D "FIRE INSPECTION TECHNIQUES AND PROCEDURES"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Authority and codes for inspecting
- Conducting the fire inspection
- Reports and records
- Fire company surveys and inspections
- Home inspections by fire companies
- Inspection of schools and other special facilities

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 110, Lesson 5 (Making Inspection, Final Interview, and Map Sketch Making), 6, 7, 8, and 9
2. IFSTA 110, Pgs. 132-223
3. Uniform Building Code, 1979 edition, or edition mandated by authority having jurisdiction
4. Edmonds, Washington Home Inspection program (SFMO)

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition
  - 9-30 (Fire Prevention Operational Tasks)
  - 12 (Alarm and Communication System)
  - 11-7 (Water Distribution Systems)
  - 14 (Sprinkler Systems)
  - 9-26 (Pre-planning and Inspection Services)
  - 8-6 (Inspections of Residential Properties)
  - 8-24 (Inspection of Public Assembly Buildings)
  - 10-15 (Traffic and Exit Drills)
2. NFPA 101 (Code for Safety to Life from Fire in Buildings and Structures)
3. NFPA 15 (Water Spray Fixed Systems)
4. NFPA 13E (Fire Department Operations in Properties Protected by Sprinkler and Standpipe Systems)
5. Alaska Fire Safety Code

### INSTRUCTOR MATERIALS:

1. Examples of department inspection forms
2. Visuals of local target hazards (industries, schools, etc.)

DESCRIPTION OF DRILL:

This drill should emphasize the technique of conducting fire inspections; types of hazards to look for; importance of inspection records and reports; inspections by fire companies; and inspections of homes, schools, and other special facilities such as nursing homes and hospitals.

DRILL SETTING:

This drill should be held in the classroom. Visual aids of target hazards, schools, hospitals, etc. in your area might be used to depict specific areas of this topic. An experienced fire marshal might be available to speak on this topic.

## FFI - 12D "FIRE INSPECTION TECHNIQUES AND PROCEDURES"

### TIME:

2 hours

### OBJECTIVES:

To provide the student with a basic understanding of inspection techniques and procedures.

### COVERAGE:

Conducting the fire inspection; reports and records; fire company surveys and inspections; home inspections by fire companies; inspection of schools and other special facilities

### MATERIALS:

1. Examples of department inspection policies
2. Examples of department inspection forms
3. Visual aids of local target hazards

### PREPARATION:

1. Review the following material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 110, Lessons 5, 6, 7, 8 and 9
  - IFSTA 110, Pgs. 132-223
  - Uniform Building Code, 1979 edition, or edition mandated by authority having jurisdiction
2. Make ready materials
3. Make ready classroom

### INTRODUCTION:

Discuss the importance of inspections and the necessity to perform them in a uniform manner, representative of your organization and its goals regarding the inspection program.



**PRESENTATION:**

1. Conducting the Inspection
  - A. Briefing the responsible occupant
    - (1) objectives, authority, responsibility
    - (2) fire drills (where applicable)
    - (3) evacuation procedures
    - (4) basic firefighting techniques
    - (5) the recognition and elimination of fire hazards
  - B. Attitude - convince occupant
    - (1) fire laws and ordinances are not arbitrary
    - (2) you are both working toward same goals
    - (3) you are there to assist him
  - C. Eliminating hazards (major and minor)
    - (1) structure conditions (discuss).
      - (2) trash and waste disposal receptacles
        - (a) non-combustible
        - (b) sufficient in number
        - (c) hazardous location
        - (d) over-filling
        - (e) have students list others
      - (3) general storage
        - (a) within 18-inches of electrical fixtures
        - (b) over 15-feet high
        - (c) within 36-inches of sprinkler heads (hazardous materials)
        - (d) within 18-inches of sprinklers (stacked material)
        - (e) have students list others
      - (4) smoking
        - (a) prohibited
        - (b) signs posted
      - (5) electrical
        - (a) protection adequate
        - (b) fuses or breakers adequate
      - (6) heating units
    - D. On-the-spot corrections
      - (1) if consequences are immediate and serious
      - (2) if it is a minor correction
  2. Map and Sketch Making (IFSTA 110, Pgs. 147-152, or show your mapping process)
  3. Closing Interview
    - A. Note and comment on good points
    - B. Avoid technicalities and conclusions at this time
    - C. Set up future inspection if necessary
  4. When to Write Formal Inspections
    - A. Specific life hazard exists
    - B. High value
    - C. Large target hazard
    - D. Multiple hazard process
    - E. When questionable conditions exist
    - F. When controversial conditions are found
    - G. When multiple copies are needed for board action
    - H. When owner/occupant is uncooperative
    - I. When legal action may be anticipated
    - J. When a specific agreement has been made

5. Inspection Report Writing
  - A. A report should include general information
    - (1) name of property
    - (2) date of inspection
    - (3) location
    - (4) name, address, telephone of those to be notified in case of fire
    - (5) classification of exposures
    - (6) storage of raw and finished materials
  - B. Specific findings; cite code references
  - C. Recommendations
6. Follow-up Inspections
  - A. Suspense file
  - B. Final resort actions
7. Fire Company Surveys and Inspections
  - A. Objectives - pre-fire planning
    - (1) become aware of fire and life safety conditions
    - (2) checking private fire protection systems
    - (3) assembling facts
    - (4) helping owner understand importance of survey
8. Home Inspections (a Public Education program)
  - A. Objectives
    - (1) to obtain proper life safety conditions
    - (2) to keep fires from starting
    - (3) to help improve existing conditions
9. School Inspections
  - A. Objectives
    - (1) to inspect for fire hazards
    - (2) to inspect for life safety
    - (3) to conduct fire exit drills
    - (4) to inform school officials
    - (5) to gain compliance with codes

EVALUATION:

Prepare and administer an oral or written examination covering the items presented during this lesson.

## FFI - 12E "COMPANY AND SPECIAL INSPECTIONS"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Conducting a company inspection
- Conducting any special inspection by need or request

### INSTRUCTOR REFERENCES:

1. IFSTA 110, Pgs. 170-229

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition  
9-30 (Fire Prevention Operational Tasks)
2. Edmonds, Washington, Home Inspection Program (slides and manual)

### INSTRUCTOR MATERIALS:

1. Chalkboard, chalk
2. Survey maps and reports used in your department
3. Regular and special inspection forms

### DESCRIPTION OF DRILL:

This drill should emphasize the particular features to look for during an inspection; maps and surveys used; information to be obtained and reported according to types of occupancy.

### DRILL SETTING:

This drill should be held in the classroom. Some time should be spent in smaller groups conducting inspections in the local area. Arrangements for such inspections should be made in advance and time allowed for discussion following the inspections.

## FFI - 12E "COMPANY AND SPECIAL INSPECTIONS"

### TIME:

2 hours

### OBJECTIVES:

To provide firefighters with a working knowledge of company inspections and special inspections they might be called upon to perform

### COVERAGE:

Building surveys by fire companies; survey maps and reports; making a survey; home, school and special facility inspections; authoritative reference sources

### MATERIALS:

1. Chalkboard, chalk
2. Survey maps and reports used in your department
3. Equipment used to develop survey maps and reports
4. Inspection forms

### PREPARATION:

1. Make ready materials
2. Make ready classroom area
3. Review the reference materials as you feel necessary: IFSTA 110
4. Review the content of this lesson
5. Make arrangements to survey an occupancy
6. Make arrangements for one or more special inspections

### INTRODUCTION:

Company inspections are an integral part of the fire prevention program. They familiarize personnel with occupancies, cause pre-fire plans to be developed, and assist in the elimination of hazards. Special inspections deal with those facilities which account for the majority of our annual fire deaths. To address ourselves to both types of inspections is to insure full service to our citizens.

**PRESENTATION:**

**1. Company Inspections**

**A. Building surveys by fire companies**

**(1) Objectives**

- (a) becoming aware of conditions; advise proper authority
- (b) checking adequacy of private fire protection equipment
- (c) assembling facts
- (d) helping owner/occupant to understand the importance of the survey

**(2) Essentials**

- (a) location of stairways and elevators
- (b) entrance to building
- (c) obstructions, both interior and exterior
- (d) strength of structural components
- (e) extent of and need for salvage work
- (f) life hazard
- (g) features which influence ventilation
- (h) need for breathing apparatus
- (i) locations and types of fire escapes
- (j) potential danger of water absorption in stock
- (k) location of quick-burning material
- (l) location of skylights and roof openings
- (m) location of man traps
- (n) location of toxic and radioactive materials
- (o) types of private protection devices
- (p) location of sprinklers, standpipes, hydrants
- (q) location of utility shut offs
- (r) location of fire doors, fire walls, etc.
- (s) accessibility of windows
- (t) exposure hazards
- (u) special evacuation features
- (v) location of flammable liquids

**B. Survey maps and reports**

- (1) drawings illustrate above items
- (2) reports supplement information for drawings

**C. Making the survey**

- (1) personal interview with owner/occupant to discuss reasons for survey
- (2) improve existing conditions
- (3) reports should contain
  - (a) fire apparatus response
  - (b) fire protection
  - (c) forcible entry
  - (d) ventilation
  - (e) self preservation
  - (f) rescue procedures
  - (g) salvage procedures
  - (h) firefighting procedures

## 2. Special Inspections

### A. Home inspections - a public education effort

#### (1) Objectives

- (a) proper life safety conditions
- (b) keep fire from starting
- (c) help owner/occupant understand and improve conditions

#### (2) Regulations

- (a) permission to inspect necessary
- (b) adult occupant must be present
- (c) make no "recommendations" to owner/occupant
- (d) no public comment regarding specific inspections
- (e) records confidential
- (f) inspections done in teams of two

#### (3) What to look for

- (a) condition of roof
- (b) condition of chimney
- (c) condition of yard
- (d) waste burners
- (e) condition of garage and sheds
- (f) flammable liquids - amount, storage
- (g) rubbish, trash
- (h) heating devices
- (i) electrical equipment
- (j) condition of fire equipment

### B. School Inspections

#### (1) Purpose

- (a) inspect for fire hazards
- (b) inspect for life safety
- (c) conduct fire exit drills
- (d) inform school officials

### C. Inspection of special facilities

- (1) nursing or rest homes
- (2) day nurseries
- (3) parade floats
- (4) decorations

### D. Authoritative reference sources

- (1) Fire Protection Handbook
- (2) National Fire Codes
- (3) Building codes
- (4) Fire Prevention Code
- (5) National Electrical Code
- (6) Underwriters' Laboratories
- (7) Fire records and reports
- (8) Inspection manual
- (9) Other sources

## APPLICATION:

Distribute survey equipment maps and report forms to firefighters. Direct them to the occupancy you have chosen to survey, and proceed with the survey.

Have firefighters inspect one or more special occupancies with which you have made arrangements. They should use reports and forms provided by your department.

EVALUATION:

Evaluate the survey maps and reports as developed by the firefighters. Assist and offer suggestions which will improve the quality of future survey maps and reports.

Observe firefighters during their inspections and evaluate the results. Offer suggestions as to how inspections might be improved in the future.

NFPA 1001 STANDARD 3-11.4

## FFI - 12F "FIRE INVESTIGATION AND REPORTING"

### TIME:

4 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Procedure for determining fire cause
- Preparation of official fire report

### INSTRUCTOR REFERENCES:

1. IFSTA Instructor's Guide Sheet 104, Lesson 10
2. IFSTA 104, Pgs. 87-94
3. IFSTA 110, Pgs. 38-40 (Fire Hazards and Cause)
4. National Fire Academy, "Fire and Arson Detection" Instructors' Manual
5. ANFIRS coding manual and forms

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition
  - 1-19 (Standards for Ignition Sequence)
  - 1-25 (Fire Losses by Fire Ignition Sequences)
2. Fire Investigation, by Paul Kirk

### INSTRUCTOR MATERIALS:

1. Fire Incident Field Investigation (FIFI) slides
2. Film, "Marshal 5 - Fire Investigation"
3. State Fire Marshal's computer print-outs

### DESCRIPTION OF DRILL:

This drill should emphasize the procedure in determining fire cause prior to overhaul, and data needed for the fire report.

### DRILL SETTING:

This drill should be in a classroom setting; however, a recent fire scene might be used to supplement the instruction. An experienced fire marshal or fire investigator might be available to speak on this topic.



## FFI - 12F "FIRE INVESTIGATION AND REPORTING"

### TIME:

4 hours

### OBJECTIVES:

To provide the students with a basic understanding of the procedures involved in determining fire cause, using proper reporting procedures.

### COVERAGE:

Fire cause determination; area of origin; equipment involved; form of heat of ignition; form and type of material ignited; and ignition factor. ANFIRS Incident and Casualty Reports

### MATERIALS:

1. ANFIRS coding manual, guide, and forms
2. Chalkboard, chalk
3. Visual aids: "EIFI" and "Marshal 5" film
4. Hexagonal Elimination Process (HEP) Charts

### PREPARATION:

1. Arrange for fire marshal or fire investigator to assist in instructing this session if possible.
2. Review reference material as you feel necessary:
  - IFSTA Instructor's Guide Sheet 104, Lesson 10
  - IFSTA 104, Pgs. 87-94
  - IFSTA 110, Pgs. 38-40
  - "Fire and Arson Detection" instructor's manual
  - ANFIRS coding manual and forms
3. Make copies of guides found on Pgs. 87-94, IFSTA 104
4. Make ready classroom

### INTRODUCTION:

Discuss with your students the importance of determining cause and accurate reporting.

### PRESENTATION:

1. Review Fire Chemistry and the Behavior of Fire
2. Categories of Cause
  - A. Natural
  - B. Accidental
  - C. Incendiary

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3. Six basic causal factors
  - A. Area of origin
  - B. Equipment involved
  - C. Form of heat of ignition
  - D. Form of material ignited
  - E. Type of material ignited
  - F. Ignition factor
4. Investigation begins when alarm is received
5. Observations
  - A. Prior to and during extinguishment
  - B. Prior to overhaul
    - (1) locating area and point of origin
    - (2) verification of indicators
6. Preservation of evidence
7. Reporting procedures

**EVALUATION:**

Provide a written scenario or actual fire scene for which the students will determine cause and complete the causal portion of a report.

**TASK PERFORMANCE:**

Task No. 59

## FFI - 12G "RECOGNIZING AND PRESERVING EVIDENCE OF ARSON"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Recognizing evidence of arson
- Preserving evidence of arson
- Firefighter's responsibility in arson detection.

### INSTRUCTOR REFERENCES:

1. National Fire Academy "Fire and Arson Detection" Instructor's Manual
2. IFSTA Instructor's Guide Sheet 104, Lesson 11
3. IFSTA 104, Pgs. 95-99

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. NFPA 604, Appendix A-4302(2), (Not Disturbing Evidence)
2. Fire Protection Handbook -14th edition
  - 1-19 (Incendiary Fire Investigation)
  - 1-20 (Suspicious Incendiarisms)

### DESCRIPTION OF DRILL:

This drill should emphasize recognizing and preserving evidence of arson and the firefighter's responsibility in arson detection.

### DRILL SETTING:

This drill should be held in the classroom. An experienced fire marshal or fire investigator might be available to speak on this topic.

## **FFI - 12G "RECOGNIZING AND PRESERVING EVIDENCE OF ARSON"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide the student with a basic understanding of recognizing and preserving evidence and the firefighter's responsibility in arson detection.

### **COVERAGE:**

Protecting, preserving and identifying evidence

### **MATERIALS:**

1. Chalkboard, chalk
2. Handout "Outline of Activities Recognizing Evidence"

### **PREPARATION:**

1. Review the following material as you feel necessary:
  - NFA, "Fire and Arson Detection" Instructor's Manual
  - IFSTA Instructor's Guide Sheet 104, Lesson 11
  - IFSTA 104, Pgs. 95-99
2. Try to arrange for Fire Marshal to be available during class
3. Make ready handout
4. Make ready classroom

### **INTRODUCTION:**

Discuss with your students the importance of recognizing and preserving evidence.

### **PRESENTATION:**

1. Recognizing Evidence (IFSTA 104, Pgs. 95-97)
  - A. Hand out outline
  - B. Cover outline with class
  - C. Discuss key points
2. Protecting and Preserving Material Evidence
  - A. Keep evidence where it was found
  - B. Identify, safeguard
  - C. Avoid trampling during fire suppression
  - D. Discuss examples with students

3. Identify, Preserve, Remove, and Safeguard Evidence
  - A. Discuss collection of evidence
  - B. Protection of evidence
  - C. Removal of evidence
    - (1) Proper authorities
    - (2) Sign for evidence
    - (3) Keep under lock and key

**EVALUATION:**

1. Have students list items they should observe at the scene of a fire.
2. Have students indicate proper procedures in:
  - A. Protecting evidence
  - B. Identifying, preserving, removing, and safeguarding evidence
3. Observation of the students during the session.

### **FFI - 13 FIRE ALARMS AND COMMUNICATIONS**

<b>FFI - 13A Communications and Facilities</b>	<b>2 hours</b>
<b>FFI - 13B Response and Fire Ground Procedures</b>	<b>2 hours</b>
<b>FFI - 13C Tests, Records, and Reports</b>	<b><u>2 hours</u></b>
<b>TOTAL 6 hours</b>	

## FFI - 13A "COMMUNICATIONS AND FACILITIES"

### TIME:

2 hours

### OBJECTIVES:

Develop a basic understanding of the following:

- Alarm receiving equipment
- Communications facilities
- Watch room duties
- Radio regulations
- Communications terminology

### INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition  
9-34 (Communications)  
9-41 (Facilities)
2. Fire Service Communications for Fire Attack, by Warren Kimball
3. Department regulations pertaining to communications

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. NFPA 73 (Public Fire Service Communications)

### MATERIALS, EQUIPMENT:

Communications equipment used by the department having jurisdiction

### DESCRIPTION OF DRILL:

This drill should emphasize communications as they apply to your own department. It should include written Standard Operating Procedures as well as verbal communication.

### DRILL SETTING:

This drill should be conducted within the classroom initially, with time allowed for tour and explanation of your own department communications and facilities.

## FFI - 13A "COMMUNICATIONS AND FACILITIES"

### TIME:

2 hours

### OBJECTIVES:

To provide firefighters with a basic understanding of fire department communications and facilities

### COVERAGE:

Alarm receiving equipment; telephone facilities; fire station watch room; watch room equipment and services; reference materials in watch rooms; house watch duty; facilities for unattended fire stations; emergency power for fire stations; radio regulations; communications terminology

### MATERIALS:

1. Chalkboard, chalk
2. Copies of departmental radio codes or standards for each firefighter
3. Radios used by your department

### INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition
2. Fire Service Communications for Fire Attack, by Warren Kimball

### PREPARATION:

1. Make ready materials
2. Make ready classroom area
3. Review the content of this lesson

### INTRODUCTION:

The alarm receiving equipment and related facilities in a fire department comprise an essential part of fire department communications and response systems. Radio units allow a greater mobility of men and apparatus while maintaining communications.



**PRESENTATION:**

**1. Fire Station Communications and Facilities**

**A. Alarm Receiving Equipment**

- (1) conveniently located so as to alert personnel
- (2) all equipment in vicinity of watch desk
- (3) when watch desk not maintained, sufficient alarms should be placed throughout station
- (4) facility shall receive alarms by two distinct means
- (5) two sources of power should be available
- (6) plug-ins should not be easily removed
- (7) main power source shall be indicated by light

**B. Telephone Facilities**

- (1) a telephone shall be installed at each station
- (2) shall not be able to be called by public except:
  - (a) through a common switching point
  - (b) where there is only one station in community
- (3) personal calls shall not be received on emergency line(s)

**C. Fire Station Watch Room**

- (1) should have view of apparatus floor
- (2) should have view of street approaches
- (3) should be able to give officers directions quickly
- (4) should be large enough to house all necessary equipment

**D. Watch Room Equipment and Services**

- (1) alarm desk or console
- (2) company journals and records regarding alarms received
- (3) department rules and regulations
- (4) extension phones
- (5) switches for controlling station facilities
  - (a) doors
  - (b) lights
  - (c) appliances
  - (d) alarm bells
- (6) air conditioner (in hot climates)
- (7) switches for controlling outside facilities
  - (a) traffic lights
  - (b) outside lighting
- (8) means by which to acknowledge alarm
- (9) microphones

**E. Reference Materials in Watch Room**

- (1) directories
  - (a) running cards
  - (b) running books
- (2) response assignments
- (3) maps of area
- (4) pre-fire plans
- (5) resource book

**F. House Watch Duty**

- (1) rotating duty (below company officer)
- (2) duty includes
  - (a) receive alarms
  - (b) announce alarms
  - (c) dispatch appropriate apparatus
- (3) keeps journal
- (4) keeps up status boards

- G. Facilities for Unattended Stations
  - (1) outside electric siren
  - (2) compressed air horns
- H. Emergency Power for Fire Stations
  - (1) secondary power sources necessary
  - (2) need for portable generators
- 2. Radio Communications
  - A. Use of radio signals
    - (1) alarm boxes
    - (2) mobile units
  - B. Federal Communications Commission Authorization - all radio transmissions
  - C. FCC Frequency Allocations
    - (1) fire service radios tuned to close tolerances
    - (2) broad-band categories
      - (a) general commercial
      - (b) aviation
      - (c) marine radio
      - (d) citizen band
      - (e) public safety
      - (f) television
  - D. Classes of Fire Radio
    - (1) fixed or base stations
    - (2) mobile stations
  - E. Fire Service Radio Bands
    - (1) general bands
      - (a) 33.42 to 46.50
      - (b) 153.77 to 170.150
      - (c) 453.050 to 465.625
      - (d) 470 to 512
    - (2) must be checked periodically
  - F. Authorized Use of Fire Radio
    - (1) used by authorized personnel only
    - (2) must be used for purposes specified in applications
    - (3) unauthorized use a federal offense
    - (4) authorized personnel are members of department only
    - (5) monitoring of fire service frequencies by non-authorized personnel prohibited
  - G. State Fire Radio Plans - provide for
    - (1) local fire department use
    - (2) mutual aid frequencies
  - H. Fire Radio Procedures
    - (1) IAFC adopted procedures manual in 1954
    - (2) Manual contained:
      - (a) radio speech
      - (b) use of code words and signals
      - (c) message priority
      - (d) dispatcher instructions, etc.
    - (3) most departments developed their own procedures, codes
  - I. Radio Codes
    - (1) ten code
    - (2) twelve code
    - (3) phonetic alphabet

- J. Training in Radio Procedures, on
  - (1) proper use
  - (2) volume squelch settings
  - (3) obstructions
  - (4) proper positioning of microphone
  - (5) correct use of buttons and switches
  - (6) discuss procedures
  - (7) demonstrate use
- K. Message Patterns
  - (1) identify unit first
  - (2) identify whom you are calling
  - (3) state message
- L. Fire Ground Procedures
  - (1) designate one unit for field control
  - (2) prioritize messages
  - (3) deliver orders to incoming units to save time when they arrive

**APPLICATION:**

Demonstrate the proper use of radios used in your department.

**SUMMARY:**

Review the content of this lesson with your firefighters, answering any questions they might have regarding its content.

**EVALUATION:**

Develop and administer a written or oral examination covering the material presented during this lesson.

**TASK PERFORMANCE:**

Task No. 60

## FFI - 13B "RESPONSE AND FIRE GROUND PROCEDURES"

### TIME:

2 hours

### OBJECTIVES:

To develop a basic understanding of the following:

- Basic response to an alarm
- Radio progress reports
- Command posts

### INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition  
9-34 (Communications)  
9-56 (Radio Equipment)
2. Fire Service Communications for Fire Attack, by Warren Kimball
3. IFSTA 302, Pgs. 14-16 (Communication Facilities)
4. IFSTA 302, Pgs. 76-86 (Relation of Procedures to Fire Company Operation; Dispatch and Response of Fire Companies)
5. Regulations used by the fire department having jurisdiction

### DESCRIPTION OF DRILL:

This drill should emphasize written standard operating procedures covering operations from the initial alarm through fire ground operations. Hypothetical situations should be set up and communications worked out according to local department standard operating procedures.

### DRILL SETTING:

This drill should be conducted in the classroom, with time allowed for practical application of information presented.

## FFI - 13B "RESPONSE AND FIRE GROUND PROCEDURES"

### TIME:

2 hours

### OBJECTIVE:

To provide firefighters with a basic understanding of response and fire ground procedures.

### COVERAGE:

Operations control; dispatching and response to alarms; response assignments; transfers and relocations; dispatch procedures; turning out the company; enroute to alarms; arrival reports; radio command posts; progress reports; releasing companies.

### MATERIALS:

1. Chalkboard, chalk
2. Communications equipment as used by department having jurisdiction

### PREPARATION:

1. Review the following material as you feel necessary:  
--Fire Protection Handbook-14th edition (9-34, 9-56)
2. Make ready materials
3. Make ready classroom

### INTRODUCTION:

Communicating facilities and procedures play a major role in the efficient direction and control of fire fighting operations. To get maximum efficiency from apparatus and manpower, we must establish standard procedures. This will include the response standards set up through the alarm center.

### PRESENTATION:

1. Response and Fire Ground Procedures
  - A. Operations Control
    - (1) alarm center
      - (a) priority operations
      - (b) handle secondary emergencies

- (2) fire ground
  - (a) establish organization
  - (b) chain of command
  - (c) plan of attack
- (3) alarm center personnel must
  - (a) call for assistance
  - (b) call utility services
  - (c) exercise judgement in utilizing air time
- B. Dispatching and Response to Alarms
  - (1) respond only by direction of alarm center
  - (2) dispatch to alarm to which you were summoned
  - (3) give units specific addresses
  - (4) make clear what units are to respond
- C. Response Assignments
  - (1) pre-determined first alarm response
  - (2) second alarm should duplicate first alarm
  - (3) fire officer in charge should request a multiple alarm when necessary
  - (4) pre-program special alarms
    - (a) brush grass
    - (b) medical
  - (5) full assignment when first company in reports smoke or flame
  - (6) response should be pre-programmed through three alarms
  - (7) it is the duty of the dispatcher to complete ordered assignments
- D. Transfers and Relocations
  - (1) transferred companies assume duties of station they are covering
  - (2) alarm center should have flexibility to move companies to insure adequate protection
- E. Dispatch Procedures
  - (1) should be outlined in writing
  - (2) an alarm should be sounded
  - (3) voice announces location
  - (4) companies acknowledge receipt of alarm
  - (5) a standard message pattern should be used
  - (6) units in field when alarm comes in should be contacted by radio
- F. Turning Out the Company
  - (1) give companies information
    - (a) type of fire
    - (b) location
    - (c) response
  - (2) companies acknowledge
- G. Enroute to Alarm
  - (1) advise as to quickest routes
  - (2) give companies any additional information
- H. Arrival Reports
  - (1) situation report upon arrival
  - (2) indicate if additional equipment is necessary
- I. Radio Command Post
  - (1) at every fire
  - (2) usually officer in charge
  - (3) aide to chief is usually communications officer
  - (4) operations control should monitor all traffic
  - (5) give progress report
  - (6) hand signals
  - (7) traffic control

**J. Releasing Companies**

- (1) as available
- (2) advise alarm center as to status
  - (a) need hose
  - (b) need water
  - (c) ready to respond, etc.

**K. Fire Ground Policies as specified by the department having jurisdiction**

**SUMMARY:**

Review the content of this lesson with your firefighters reemphasizing key points. Answer any questions they might have regarding the material covered.

**EVALUATION:**

Develop and administer a written or oral examination covering the material contained in this lesson.

**TASK PERFORMANCE:**

Task No. 60

## FFI - 13C "TESTS, RECORDS, AND REPORTS"

### TIME:

2 hours

### OBJECTIVES:

To develop a basic understanding of the following:

- Departmental tests and records
- Standard departmental reports

### INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition  
9-20 (Records and Reports)  
9-41 (Fire Stations)
2. IFSTA 208, (Records and Reports for the Fire Service)
3. IFSTA 201, Pgs. 219-224 (Fire Department Records)
4. Fire Service Communications for Fire Attack, by Warren Kimball
5. Regulations of the authority having jurisdiction

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. NFPA 9 (Training Reports and Records)

### MATERIALS, EQUIPMENT:

1. Record, report, test forms used by the department having jurisdiction

### DESCRIPTION OF DRILL:

This drill should emphasize familiarity with all records, reports, and tests presently used by the local department. Other forms which are available and might be suitable to the department's use should be passed out and discussed.

### DRILL SETTING:

This drill should be presented in the classroom, with opportunities for students to fill out representative forms.



## FFI - 13C "TESTS, RECORDS, AND REPORTS"

### TIME:

2 hours

### OBJECTIVE:

To provide firefighters with a basic understanding of tests, records and reports.

### COVERAGE:

Alarm records; fire records and reports; management reports.

### MATERIALS:

1. Chalkboard, chalk
2. Records or report forms used by the department having jurisdiction
3. Department regulations regarding tests, records and reports

### PREPARATION:

1. Review the following material as you feel necessary:
  - Fire Protection Handbook - 14th edition
  - Fire Service Communications for Fire Attack
2. Make ready materials
3. Make ready classroom

### INTRODUCTION:

Fire departments are expected to keep adequate records concerning each alarm to which response is made. Such alarm or incident reports are filled out by the operations control or alarm office whether or not this is a separate office or merely the watch room of a headquarters fire station. In addition to records of individual fires and alarms, reports and records are required concerning the operations, maintenance, and testing of the alarm system.

### PRESENTATION:

1. Tests, Records and Reports
  - A. Alarm System Tests and Records
    - (1) maintenance and operation
      - (a) the system must be supervised by responsible municipal employees

- (b) complete records shall be kept of:
    - 1. test signals
    - 2. alarm signals
    - 3. circuit interruptions
    - 4. reports of apparatus failures
  - (c) underground cables installed in manholes shall be racked and marked
  - (d) facilities must provide recording of signals as follows:
    - 1. alarms from fire alarm boxes
    - 2. recorded visual and audible signals are required to indicate receipt of alarm
    - 3. the recorded signal must include exact location
    - 4. facilities shall automatically record time alarm was received
    - 5. automatically record date and time of transmissions
  - (e) alerting devices must be checked daily.
  - (f) testing of power supplies
    - 1. manual tests three times every 24 hours
    - 2. current strength of each circuit tested
  - (g) general
    - 1. records of tests and alarms
    - 2. records must be kept up to date
- B. Fire Records and Reports
- (1) daily summary of alarms received
  - (2) radio log
  - (3) reports of tests
  - (4) record card on each public fire box
  - (5) record file on all communications equipment
  - (6) plans of wiring
  - (7) record of installation, maintenance repair, replacement, or removal
  - (8) chronological order to records
  - (9) information summarized

**SUMMARY:**

Since this is the last lesson of this unit, you might want to discuss communications in general, answering any questions your firefighters might have, not only of this lesson, but the unit in general.

**EVALUATION:**

Develop and administer an examination covering the material presented during this lesson.

## FFI - 14 SPRINKLER AND STANDPIPE SYSTEMS

FFI - 14A	Introduction to Automatic Sprinkler Systems	2 hours
FFI - 14B	Standpipe and Hose Systems	2 hours
FFI - 14C	Use of Sprinklers and Standpipes	<u>2 hours</u>
TOTAL		6 hours

## FFI - 14A "INTRODUCTION TO AUTOMATIC SPRINKLER SYSTEMS"

### TIME:

2 hours

### OBJECTIVES:

To develop a basic understanding of the following:

- The purpose and background of sprinkler systems
- The maintenance and inspection requirements for sprinkler systems

### INSTRUCTOR REFERENCES:

1. Automatic Sprinkler and Standpipe Systems, by Dr. John L. Bryan
2. IFSTA 205, Pgs. 85-89

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition  
14-1 (Fundamentals of Sprinkler Protection)
2. Uniform Building Code, 1979 edition, Chapter 38
3. NFPA, National Fire Codes, Volume 101

### DESCRIPTION OF DRILL:

This drill should emphasize the evolution of the sprinkler system as well as its effectiveness when properly maintained.

### DRILL SETTING:

This drill should be conducted in a classroom setting.

## FFI - 14A "INTRODUCTION TO AUTOMATIC SPRINKLER SYSTEMS"

### TIME:

2 hours

### OBJECTIVE:

To provide firefighters with a basic understanding of automatic sprinkler systems.

### COVERAGE:

Definition and purpose; history; development of sprinkler standards; economic variables of sprinkler systems; general maintenance and inspection procedures.

### MATERIALS:

1. Chalkboard, chalk
2. Visual aids, if available

### PREPARATION:

1. Make ready materials
2. Make ready classroom
3. Review following material as you feel necessary:
  - Automatic Sprinkler and Standpipe Systems
  - IFSTA 205
  - Uniform Building Code, 1976 edition, Chapter 38
  - NFPA, National Fire Codes, Volume 101

### INTRODUCTION:

It has been said many times that a good sprinkler system is worth the whole fire department any day of the week. Although one might question that, with all the complex operations involved in suppressing fire we cannot argue the fact that sprinkler systems can, and in most cases do, assist us in protecting property and reducing loss. As firefighters, we must have a basic understanding of automatic sprinkler systems.

**PRESENTATION:**

1. Definition and purpose: - System of pipes, tubes, or conduits provided with heads or nozzles, that is automatically activated and (in some types) deactivated, utilizing the sensing of fire-induced stimulus consisting of light, heat, visible or invisible combustion products, and pressure generation, to distribute water and water-based extinguishing agents in the fire area.
2. History of Automatic Sprinkler Systems
  - A. First Patent to Godfrey - 1723
    - (1) gunpower and water chamber
  - B. First system involving pipes - Carey 1806
    - (1) perforated pipes
    - (2) elevated tank for supply
    - (3) cord connected to valve to activate
    - (4) Congreve improved Carey system - 1812
      - (a) valves outside building
      - (b) first fire department connection
      - (c) replaced cord with fusible cement (110°)
      - (d) first alarm-valve
  - C. Perforated pipe system
    - (1) initial installation 1852 - England
    - (2) included standards
    - (3) disadvantages
      - (a) cover entire area with water
      - (b) orifices clog
  - D. Automatic sprinkler head
    - (1) first head recorded - Harrison in London
    - (2) first practical head - Parmelee - 1874
  - E. The wet automatic sprinkler systems
    - (1) the Parmelee system - 1874
      - (a) single riser - all floors
      - (b) riser size supply all of one floor
      - (c) by 1881 - 214 installations
  - F. Combination heating and sprinkler system
    - (1) Parmelee - 1872
    - (2) enlarged branch lines 1 1/2-inches to 2-inches in diameter with return lines for circulation of hot water (first looped lines)
  - G. Dry pipe automatic sprinkler system
    - (1) antifreeze solution patented 1861
    - (2) first dry pipe valve - 1864
      - (a) fusible cord - 90° to 120°F.
      - (b) sounded alarm and opened valve when cord melted
    - (3) first generally accepted dry pipe valve
    - (4) mechanical valve used until mid 1920's
      - (a) corrosion a problem
      - (b) adjustment difficult
  - H. Development of modern sprinkler system
    - (1) deluge and preaction systems.
    - (2) quartz bulb in 1924
    - (3) organic compound type head activation 1931

- (4) heat collector on head 1930's
- (5) spray type sprinkler head (became standard 1955)
- (6) ultra high speed sprinkler system 1958
- (7) multi-cycle sprinkler system 1967
- (8) on-off sprinkler head - 1972
- 3. Requirements for Installation
  - A. UBC Chapter 38 or various sections of NFPA 101 require installation of sprinklers
  - B. Requirements generally based upon type of occupancy, size of building, its special hazardous features
  - C. Modern codes requiring more built-in fire protection
  - D. May be used as a "trade-off" for more rigid construction
- 4. Economic Variables
  - A. Insurance
    - (1) cost of installation
    - (2) reduced insurance premium
    - (3) cost usually recovered in 6 to 10 years
  - B. Governmental variables
    - (1) charges for water supply
      - (a) standby charges
      - (b) water meter charge
      - (c) water meter vault costs
    - (2) 1960 - 51% of public and 88% of private water systems applied the charges
    - (3) 1971 - 65% of 93 public water department used charge
    - (4) fire service demand charge
  - C. Construction variables
    - (1) passive vs. dynamic fire protection
  - D. Life safety variables
    - (1) lives lost in sprinkled buildings
    - (2) Australia 1886-1968 only 5 fatalities
- 5. General Maintenance and Inspection Procedures
  - A. Schedules and components
    - (1) water control valves
    - (2) fire department connections
    - (3) fire pumps
    - (4) gravity and pressure tanks
    - (5) sprinkler heads and piping

#### SUMMARY:

Review the content of this lesson with your firefighters, answering any questions they might have regarding its content.

#### EVALUATION:

Develop and administer a written or oral examination covering the material presented during this lesson.

## FFI - 14B "STANDPIPE AND HOSE SYSTEMS"

### TIME:

2 hours

### OBJECTIVES:

To develop a basic understanding of the following:

- Reasons for standpipe systems
- Types of standpipe systems
- Water supplies and testing procedures for standpipes

### INSTRUCTOR REFERENCES:

1. Automatic Sprinkler and Standpipe Systems, by Dr. John L. Bryan
2. IFSTA 205, Pgs. 103-111

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Uniform Building Code, 1979 edition, Chapter 38
2. Fire Protection Handbook - 14th edition
  - 15-2 (System Classification)
  - 15-5 (Combined Sprinkler and Standpipe System)
  - 15-6 (Inspections)

### DESCRIPTION OF DRILL:

This drill should emphasize knowledge of the classification of standpipe systems, how and when to use each, water supply for each, and department standard operating procedures for standpipes.

### DRILL SETTING:

This drill should be presented in the classroom, with provision for observation of the various classifications if available. Follow up time should be allowed for practical application.



## FFI - 14B "STANDPIPE AND HOSE SYSTEMS"

### TIME:

2 hours

### OBJECTIVES:

To provide firefighters with a basic understanding of standpipe and hose systems.

### COVERAGE:

Standpipe systems; classification of standpipe systems; types of standpipe systems; water supplies for standpipe systems; standpipe testing procedures; standpipe inspection procedures; fire department use of standpipes; combined sprinkler systems and standpipes.

### MATERIALS:

1. Chalkboard, chalk
2. Visual and training aids, if available

### PREPARATION:

1. Make ready materials
2. Make ready classroom
3. Review the following material as you feel necessary:
  - Automatic Sprinkler and Standpipe Systems
  - IFSTA 205
  - Uniform Building Code, 1979 edition, Chapter 38

### INTRODUCTION:

A very important part of our fire defenses is the utilization of standpipes and hose systems. To utilize such resources to their fullest potential we must fully understand their use and function.

### PRESENTATION:

1. Standpipe systems
  - A. Fire department use
    - (1) saves time
    - (2) saves manpower
  - B. Building occupants use for initial attack
    - (1) fire brigades
    - (2) provide exit protection

2. Installation Requirements
  - A. Prescribed by the building code, or NFPA standards
  - B. May be eliminated if building is sprinklered
3. Classification of standpipes
  - A. NFPA #14
    - (1) Class I system
      - (a) used by trained personnel
      - (b) designed for 1 1/2" hose lines
      - (c) hose pre-attached
    - (2) Class II system
      - (a) use of building occupants
      - (b) designed for 1 1/2" hose lines
      - (c) hose pre-attached
    - (3) Class III system
      - (a) used by either fire department or occupants
      - (b) 2 1/2" connects - 1 1/2" or smaller outlets
      - (c) hose attached to 1 1/2" or smaller outlets
4. Types of standpipe systems
  - A. Design of system
    - (1) wet standpipe system
      - (a) water pressure to hose
    - (2) dry standpipe system
      - (a) line charged only when valve is opened
    - (3) automatic water release by manual remote control
    - (4) dry standpipe (no water supply)
      - (a) fire department connects
      - (b) "primed system"
5. Water Supply for Standpipe System
  - A. NFPA #14 - pressure and flow requirements
    - (1) Class I and III system
      - (a) 500 gpm @ 65 psi
    - (2) Class II system
      - (a) 100 gpm @ 65 psi
  - B. Private or public mains
    - (1) direct connection
    - (2) fire pump
  - C. Fire pumps - criteria
    - (1) auto - start
    - (2) manual-start (must have 24 hour supervision)
    - (3) horizontal centrifugal type
    - (4) vertical submersible type
  - D. Gravity Tanks
    - (1) advantages
      - (a) positive head pressure
      - (b) assured water supply
    - (2) disadvantages
      - (a) maintenance
      - (b) possible freezing
  - E. Pressure tanks
    - (1) principle of operation - liquid pressure by air
      - (a) two thirds full of water
      - (b) 75 psi minimum pressure
  - F. Fire Department Connection
    - (1) NFPA #14 requirements
      - (a) no shut off valve
      - (b) check valve
      - (c) marking required

## 6. Standpipe Testing Procedures

### A. Program experience - Los Angeles

- (1) 25% of buildings impossible to deliver water
- (2) 45% of buildings had deficiencies
- (3) 70% of buildings had non-standard threads
- (4) 14% of buildings had faulty pipes
- (5) 12% of clapper valves leaked
- (6) 8% of standpipes never connected

### B. NFPA #14 - test requirements

- (1) hydrostatic test - 200 psi for 2 hours or 50 psi above normal exceeds 150 psi (test every five years)
- (2) air pressure test at 25 psi after repairs

## 7. Standpipe Inspection Procedures

### A. Frequency

- (1) dry system
  - (a) annually
- (2) wet system
  - (a) quarterly
  - (b) or semi annually

### B. Inspection features

- (1) water control valves
- (2) threads of outlets
- (3) pressure tanks
  - (a) air pressure
  - (b) water level
- (4) gravity tanks
  - (a) water level
  - (b) water temperature
- (5) fire pump
  - (a) operate weekly
- (6) fire department connections
  - (a) accessibility
  - (b) visibility
  - (c) threads
  - (d) clappers
  - (e) outlet caps
- (7) Class II and III system
  - (a) condition of hose
  - (b) hydrostatic test of hose to 200 psi annually
  - (c) threads

### C. Inspection Form

## 8. Fire department use of standpipes

### A. Standpipe pack and cart arrangements

### B. Communications

- (1) radio
- (2) telephone

## 9. Combined sprinkler systems and standpipes

### A. Advantages

- (1) high-rise buildings
- (2) promotes sprinkler installation

### B. Requirements

- (1) riser and valves in fire resistant stair enclosure
- (2) sprinklers with floor control valves in stair enclosure
- (3) minimum size riser - 6 inches
- (4) water supply for both sprinklers and standpipe
- (5) standpipe outlet so all areas within 30 feet of the end of 100 feet of hose

**SUMMARY:**

Review the content of this lesson with your firefighters answering any questions they might have regarding this lesson.

**EVALUATION:**

Develop and administer a written or oral examination covering the material presented during this lesson.

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## FFI - 14C "USE OF SPRINKLERS AND STANDPIPES"

### TIME:

2 hours

### OBJECTIVES:

To develop a basic understanding of the following:

- Principles of sprinkler protection
- Classification of sprinkler and standpipe systems
- Inspection of sprinkler systems
- Systems maintenance
- Supporting sprinkler and standpipe systems

### INSTRUCTOR REFERENCES:

1. IFSTA 205, Pgs. 85-109

### SUGGESTED SUPPLEMENTAL INSTRUCTOR REFERENCES:

1. Fire Protection Handbook - 14th edition
  - 14-1 (Fundamentals of Sprinkler Protection)
  - 14-4 (Water Supplies for Sprinkler Systems)
  - 14-6 (Care and Maintenance of Sprinkler Systems)
  - 15-1 (Standpipes and Hose Systems)

### DESCRIPTION OF DRILL:

This drill should emphasize the classification of sprinkler and standpipe systems and the practical application of means of supporting such systems.

### DRILL SETTING:

This drill should be conducted in the classroom, with provision for observation of sprinkler and standpipe systems if time permits.

## **FFI - 14C "USE OF SPRINKLERS AND STANDPIPES"**

### **TIME:**

2 hours

### **OBJECTIVES:**

To provide firefighters with a working knowledge of automatic sprinkler and standpipe systems.

### **COVERAGE:**

Principles of sprinkler protection; efficiency of automatic sprinklers; wet-pipe sprinkler systems; dry-pipe sprinkler systems; sprinkler water supplies; water control valves for sprinkler systems; inspecting sprinkler systems; observing sprinkler operations; auxiliary devices; supporting the system; sprinkler maintenance; standpipe and hose systems classified; minimum distribution criteria; water supply for standpipe systems; standpipes in high-rise buildings; standpipe siamese fire department connections; tests and maintenance.

### **MATERIALS:**

1. Chalkboard, chalk
2. Various types of sprinkler heads

### **REFERENCES:**

1. IFSTA 205, Pgs. 85-109
2. Fire Protection Handbook - 14th edition

### **PREPARATION:**

1. Review the following material as you feel necessary:  
IFSTA 205, Pgs. 85-109
2. Make ready classroom area

### **INTRODUCTION:**

Discuss with members the importance of automatic sprinkler and standpipe systems, emphasizing the role they play in the protection of various facilities within your jurisdiction.

**PRESENTATION:**

1. Automatic sprinkler systems
  - A. Principles of sprinkler protection
    - (1) water supplied by pipes
    - (2) sprinkler heads apply water
      - (a) pendent (point down)
      - (b) upright (point up)
  - B. Efficiency of automatic sprinklers
    - (1) failure to activate is very rare
    - (2) approximately \$150 billion worth of property protected by sprinklers in U.S.
    - (3) loss approximately 90% less than NON-sprinkled facilities
    - (4) 96% of fires in sprinkled facilities were extinguished or held in check
  - C. Types of sprinkler systems
    - (1) wet-pipe sprinkler systems
      - (a) full of water at all times
      - (b) under pressure at all times
      - (c) actuates alarm when water flows
    - (2) dry-pipe sprinkler systems
      - (a) air under pressure
      - (b) dry pipe valve keeps water out of piping
      - (c) when sprinkler head fuses - valve opens
      - (d) activates alarm when water flows
      - (e) accelerators and exhausters assist in removing air from piping quickly
  - D. Sprinkler water supplies
    - (1) automatic water supply
      - (a) adequate volume
      - (b) adequate pressure
      - (c) reliable
    - (2) requirements
      - (a) deliver required volume to highest head
      - (b) 15 psi residual pressure to top line (minimum)
      - (c) 500 gpm minimum flow (system)
    - (3) types of water supply
      - (a) municipal system
      - (b) gravity tank
      - (c) pressurized tanks
        1. two thirds water - one third air
        2. 75 psi (air pressure)
    - (4) auxiliary water supply
      - (a) fire department connection
        1. boost volume and pressure
        2. sprinkler system side of main water control valve
  - E. Water control valves
    - (1) between source of water and sprinkler system
    - (2) indicating type control valve
      - (a) post indicator butterfly valve (P.I.V.)
      - (b) post indicator gate valve (P.I.V.)
      - (c) outside screw and yoke valve (OS & Y)

**F. Inspecting sprinkler systems**

**(1) pre-fire plans**

- (a) identify and locate all sprinkled properties
- (b) observe and record non-sprinkled properties
- (c) locate and record fire department connections
- (d) locate and record available water
- (e) equip apparatus with equipment
  - 1. sprinkler heads
  - 2. sprinkler head wrench
  - 3. sprinkler stops or plugs

**(2) inspection procedures**

- (a) determine if system is on operation
- (b) check for structural changes
  - 1. new buildings
  - 2. expansion of existing buildings
- (c) check siamese connection(s)
  - 1. correct threads
  - 2. damage
  - 3. accessible
  - 4. caps for removability
- (d) check hydrants supplying area
  - 1. accessible
  - 2. openable
  - 3. properly marked
- (e) check for availability of extra heads, wrenches, etc.
- (f) check valves to see if marked properly
  - 1. area they protect
  - 2. volume supplied
- (g) encourage reporting of damage, closed valves, etc.

**G. Observing sprinkler operations**

- (1) connections made according to pre-fire plan
- (2) check control valves
- (3) maintain operation until assured fire is out
- (4) restore sprinkler equipment

**H. Supporting the system**

- (1) select pumper
  - (a) supply adequate water
  - (b) supply adequate pressure
- (2) use two supply lines
- (3) locate fire, order hose lines charged
- (4) develop ISO psi and maintain (if possible)
- (5) attack fire with hand lines
- (6) get to unprotected areas
- (7) do not rob sprinkler system of water
- (8) avoid premature shut-off
- (9) keep pumper attached during overhaul
- (10) restore sprinkler system

**2. Standpipe Systems**

**A. Types**

- (1) wet standpipe system
  - (a) supply valve open
  - (b) water pressure maintained



- (2) dry standpipe system (automatic)
- (3) dry standpipe system (manual)
- (4) dry standpipe system (no permanent water supply)
- B. Classes
  - (1) Class I
    - (a) fire department use or trained personnel
    - (b) 2 1/2" hose
  - (2) Class II
    - (a) for occupants' use
    - (b) small hose 1" or 1 1/2"
  - (3) Class III
    - (a) fire department or occupant use
    - (b) large lines - advanced stage of fire
- C. Distribution criteria
  - (1) Class I and III
    - (a) nozzle 30' from any place in building
    - (b) attached to not more than 100' of hose
  - (2) Class II
    - (a) nozzle 20' from any place in building
    - (b) attached to not more than 75' of hose
- D. Water supply for standpipes
  - (1) Class I system
    - (a) 500 gpm for minimum of 30 minutes
    - (b) 250 gpm for each additional standpipe
  - (2) Class II system
    - (a) 100 gpm for minimum of 30 minutes
    - (b) 65 psi residual pressure at top most outlet
  - (3) Class III system
    - (a) same as Class I
- E. Standpipes in high-rise buildings
  - (1) maximum height - 275'
  - (2) zones for additional height  
(see IFSTA 205, pg. 108, fig. 22)
- F. Tests and maintenance
  - (1) new installations
    - (a) hydrostatically tested - minimum 200 psi
    - (b) inspect all pipe, fittings, connections
  - (2) periodic inspections
    - (a) inspect hose, nozzles, threads
    - (b) inspect valves, piping
    - (c) accessibility

APPLICATION:

none

SUMMARY:

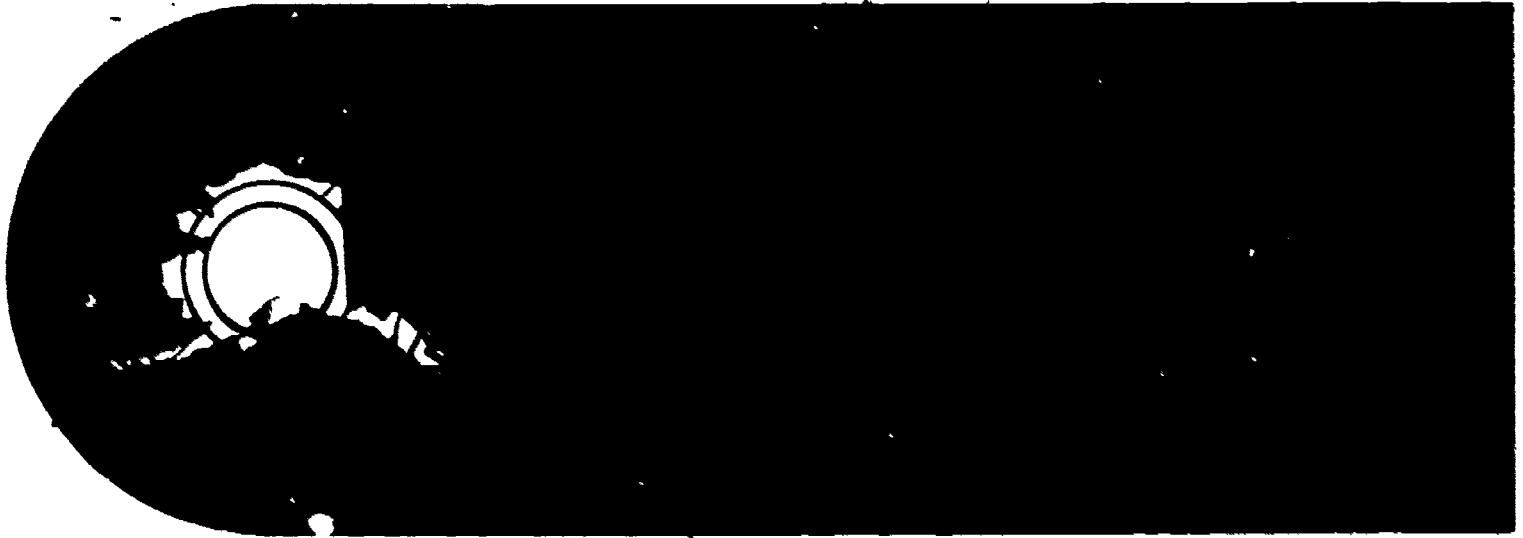
Review main topics covered in this lesson, asking for questions or clarification of any material covered.

**EVALUATION:**

Develop and administer an oral or written examination covering the material in this lesson.

**TASK PERFORMANCE:**

Tasks No. 61, 62



Prepared by  
William A. Hagevig, Supervisor  
Leigh S. Gallagher, Program Coordinator

STATE OF ALASKA  
DEPARTMENT OF EDUCATION  
FIRE SERVICE TRAINING PROGRAM  
JUNEAU, ALASKA

TASK PERFORMANCE CRITERIA  
FIREFIGHTER I LEVEL

DEPARTMENT OF EDUCATION  
MARSHALL L. LIND, COMMISSIONER

FIRE SERVICE TRAINING PROGRAM  
WILLIAM A. HAGEVIG, SUPERVISOR  
LEIGH S. GALLAGHER, COORDINATOR

JULY 1, 1979 28

## TASK PERFORMANCE CRITERIA

### Firefighter I Level

A firefighter's actions during the stress of an emergency situation are the best measure of his professional skills. His performance during training sessions is a measure of his potential to perform under stress. Maintenance of performance skills is dependent upon a well structured, continuing training and evaluation program, one which addresses not only skills, but also the use of basic safety procedures and the ability to implement the skills under continually changing conditions.

The task performance criteria were developed to serve three purposes:

1. To establish performance standards to be met prior to accreditation.
2. To provide tasks which meet the performance objectives of NFPA 1001.
3. To serve as a study guide for basic skills.

Successful completion of the performance tasks by the trainee must be documented by the local training officer or fire chief. This is accomplished by submission of Form No. FSTP - FFI-1 (see sample, page iii) to the Fire Service Training Supervisor.

It is recognized that all tasks may not fully apply to every fire department. Those which are not applicable, and therefore not performed, must be indicated on the certification form, together with an explanation for the exceptions. All tasks which do apply to the fire department having jurisdiction must be performed in a satisfactory manner by the applicant to be eligible for certification at the Firefighter I level.

Remember, the training officer or fire chief must be satisfied that the trainee is competent to perform the tasks before he signs the certification form.

As noted earlier, this material is presented as a minimum standard and as a study guide for the firefighter. You may expect revisions to occur to meet the training demands of the fire service of Alaska.

## CERTIFICATION OF TASK PERFORMANCE REQUIREMENTS

This is to certify that \_\_\_\_\_ has successfully completed all Task Performance Criteria at the Firefighter I level according to the standards specified by the Alaska Fire Service Training Program. Unless indicated below, the applicant has met all requirements specified in the Task Performance Criteria.

### EXCEPTIONS:

### EXPLANATION OF EXCEPTIONS:

I HEREBY ATTEST THAT THE ABOVE STATEMENT IS TRUE, TO THE BEST OF MY KNOWLEDGE.

\_\_\_\_\_  
Director of Training

\_\_\_\_\_  
Date

\_\_\_\_\_  
Fire Department

# TASK PERFORMANCE - FIREFIGHTER I LEVEL

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## **TASK # 1 - USING PORTABLE EXTINGUISHERS ON CLASS "A" FIRES**

### **REFERENCE:**

IFSTA 101, Section 3  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-4C  
FSTP Lesson Plan - FFI-4C

### **EQUIPMENT:**

1. Triple combination pumper equipped in the manner prescribed by the department, to be used as backup.
2. Various types and classes of extinguishers as available to the fire department.
3. Supplies of agent needed to refill extinguishers, if necessary.
4. Full protective clothing
5. Materials and/or structure suitable for Class "A" fire

### **DRILL SITE:**

Fire department training grounds

### **PERFORMANCE:**

Demonstrate the ability to extinguish a deep-seated class "A" fire at least 3' x 3' and 3" deep, using the correct fire extinguisher size and type. Fire is to be free burning at least 2 minutes; extinguishers are to be located 30 feet from the fire.

### **STANDARDS:**

1. Use correct attack.
2. Use extinguishing agent effectively.
3. Demonstrate ability to extinguish fire without scattering it appreciably.
4. Perform the task safely.
5. Perform the task swiftly.

## TASK # 2 - USING PORTABLE EXTINGUISHERS ON CLASS "B" FIRES

### REFERENCE:

IFSTA 101, Section 3  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-4C  
FSTP Lesson Plan - FFI-4C

### EQUIPMENT:

1. Triple combination pumper equipped in the manner prescribed by the department, to be used as backup.
2. Various types and classes of extinguishers as available to the fire department.
3. Supplies of agent needed to refill extinguishers, if necessary.
4. Full protective clothing.
5. Burn barrel for flammable liquid fire.

### DRILL SITE:

Fire department training grounds.

### PERFORMANCE:

Demonstrate the ability to extinguish a small class "B" flammable liquid fire using the correct fire extinguisher size and type. Fill a barrel, a pan, or pit with a minimum of 3' of water, and 1 to 3 gallons of flammable liquid, or enough to insure free-burning for at least 30 seconds prior to extinguishment. Extinguishers are to be located at least 30 feet from the fire.

### STANDARDS:

1. Use correct attack.
2. Use extinguishing agent effectively.
3. Demonstrate ability to extinguish fire without overflowing container, spreading fuel or fire.
4. Perform the task safely.
5. Perform the task swiftly.

## **TASK # 3 - IDENTIFICATION OF FORCIBLE ENTRY TOOLS**

### **REFERENCE:**

IFSTA 101, Pgs. 10-14  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-5A, FFI-5D, FFI-5E  
FSTP Lesson Plan - FFI-5A, FFI-5D, FFI-5E

### **EQUIPMENT:**

All forcible entry tools available to the department which should include as a minimum:

1. Pick-headed fire axe
2. Spanner wrench
3. Prying tools
4. Pike pole
5. Bolt cutters
6. Sledge hammer
7. Wood and metal hand saws
8. Power saws

### **DRILL SITE:**

Fire department apparatus room

### **PERFORMANCE:**

Given the name of a particular forcible entry tool, the firefighter shall locate the tool where it is normally carried in the department and briefly demonstrate some common uses for each tool.

### **STANDARDS:**

1. Locate tools swiftly by going directly to the correct compartment or tool mount without hesitation.
2. Properly demonstrate at least two possible uses of each tool.
3. Do not abuse the tools or equipment.
4. Perform the task safely by properly carrying and handling each tool.

NFPA 1001 STANDARD 3-2.1

## TASK # 4 - MAINTENANCE OF FORCIBLE ENTRY TOOLS

### REFERENCE:

IFSTA 101, Pgs. 3-14  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-5A  
FSTP Lesson Plan - FFI-5A

### EQUIPMENT:

All of the forcible entry tools available in the department which should include as a minimum:

1. Fire axe
2. Crow bar
3. Spanner wrench
4. Pike pole
5. Power saws
6. Bolt cutters
7. Sledge hammer
8. Wood and metal hand saws

### DRILL SITE:

1. Fire department training room
2. Fire department apparatus room

### PERFORMANCE:

Demonstrate the proper method of cleaning, maintaining, and inspecting forcible entry tools. This task can be covered well by simulation and explanation since tools needing maintenance may not be available.

### STANDARDS:

1. Use cleaning materials prescribed by the department.
2. Use proper maintenance techniques as prescribed by the department.
3. Inspection should be thorough.
4. Perform the task safely.

NFPA 1001 STANDARD 3-2.2

## TASK # 5 - OPENING LOCKED SWINGING DOORS

### REFERENCE:

IFSTA 101, Pgs. 15-39  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-5B  
FSTP Lesson Plan - FFI-5B

### EQUIPMENT:

1. Two fire axes
2. Two prying tools
3. Other forcible entry tools as prescribed by the department

### DRILL SITE:

1. An abandoned building awaiting demolition
- \*2. Fire department training grounds
- \*3. Fire station

### PERFORMANCE:

Demonstrate the ability to open swinging doors, one of which shall open toward the firefighter and one of which shall open away from the firefighter.

### STANDARDS:

1. Use an accepted method of opening two swinging doors.
2. Use the method which would result in the least damage.
3. Perform task safely by properly handling the tools.
4. Perform the task swiftly.

\*It is not necessary to damage the building since demonstration may be through simulation or explanation.

## TASK # 6 - OPENING LOCKED WINDOWS

### REFERENCE:

1. FSTA 101, Pgs. 42-51  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-5C  
FSTP Lesson Plan - FFI-5C

### EQUIPMENT:

1. Fire axe
2. Prying tools
3. Other forcible entry tools as prescribed by the department

### DRILL SITE:

1. An abandoned building awaiting demolition
- \*2. Fire department training grounds
- \*3. Fire station

### PERFORMANCE:

Demonstrate the ability to open locked windows. Use as many different types of windows as can be found in the building. If only one type is available, explain the method used for other windows.

### STANDARDS:

1. Use an accepted method of opening the windows.
2. Use the method which would result in the least damage.
3. Demonstrate the method of opening for at least three different types of windows.
4. Perform the task safely by properly handling tools and protecting oneself from injury.
5. Perform the task swiftly.

### NFPA 1001 STANDARD 3-10.3

\*It is not necessary to damage the building since demonstration may be by simulation or explanation.

## **TASK # 7 - BREAKING WINDOW OR DOOR GLASS**

### **REFERENCE:**

IFSTA 101, Pgs. 21-22, 29-31  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-5C  
FSTP Lesson Plan - FFI-5C

### **EQUIPMENT:**

1. Fire axe
2. Pike pole
3. Other forcible entry tools

### **DRILL SITE:**

1. Fire department training grounds
2. Fire department training room

### **PERFORMANCE:**

Demonstrate the ability to properly break window or door glass and remove the remaining fragments. Since windows which can be broken are rarely available for use, simulation and explanation using an open window frame or even a chalkboard is adequate.

### **STANDARDS:**

1. Use proper procedure for breaking glass as prescribed by the department.
2. Select the proper tools.
3. Perform the task safely.
4. Perform the task swiftly.

## TASK # 8 - OPERATION OF POWER TOOLS

### REFERENCE:

Fire Department Training Manual  
Manufacturer's Operator Manual  
FSTP Subject Outline Guide - FFI-5D, FFI-5E  
FSTP Lesson Plan - FFI-5D, FFI-5E

### EQUIPMENT:

All of the tools used by the department for forcible entry

### DRILL SITE:

1. Fire department training grounds
2. Fire department apparatus room

### PERFORMANCE:

Demonstrate how to operate all the power tools used in the department. The firefighter shall know how to start, handle, and shut off the tools, as well as be familiar with fuel or power source and routine maintenance.

### STANDARDS:

1. Show how to operate the tools.
2. Indicate the proper fuel or electrical current required.
3. Show where the proper fuel or current is available.
4. Indicate the proper routine maintenance required in the use of the tools.
5. Perform the task safely.
6. Perform the task without hesitation.

NFPA 1001 STANDARD 3-15.3



## TASK # 9 - OPENING A FLOOR USING A FIRE AXE

### REFERENCE:

IFSTA 101, Pgs. 64-66  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-5D  
FSTP Lesson Plan - FFI-5D

### EQUIPMENT:

1. Fire axe
2. Pike pole~

### DRILL SITE:

1. An abandoned building awaiting demolition
- \*2. Fire department training grounds

### PERFORMANCE:

Demonstrate the ability to cut an inspection hole of adequate size in a wooden floor using a fire axe.

### STANDARDS:

1. Follow accepted cutting procedures.
2. Do not cut floor joists.
3. Cut a hole large enough for adequate inspection.
4. Perform the task safely.
5. Perform the task swiftly.

### NFPA 1001 STANDARD 3-10.5

\*If an abandoned building is not available, go through the entire procedure but simulate the cuts.

## TASK #10 - TYING FIRE DEPARTMENT KNOTS

### REFERENCE:

IFSTA 101, Pgs. 93-96, 100-118  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-5F, FFI-5G, FFI-11F  
FSTP Lesson Plan - FFI-5F, FFI-5G, FFI-11F

### EQUIPMENT:

One of each size rope available in the department

### DRILL SITE:

• Fire department training room

### PERFORMANCE:

Select the proper rope and, while wearing gloves, tie all knots used by the department to include as a minimum:

1. Bowline
2. Clove hitch
3. Becket bend
4. Bowline-on-a-bight
5. Bight
6. Loop
7. Round turn
8. Half hitch

Explain the use to which each knot might be put in the department.

Restore the rope as prescribed by the department.

### STANDARDS:

1. Select the correct rope for the knot.
2. Knots should be tied correctly.
3. Knots should be tied swiftly.
4. Knots should be neat and easy to identify.
5. Knots should hold without slipping, if applicable.
6. Knots should be able to be untied swiftly.
7. The rope should be restored properly.

NFPA 1001 STANDARD 3-5.1, 3-5.3, 3-5.5

## TASK #11 - HOISTING TOOLS

### REFERENCE:

IFSTA 101, Pgs. 93-96, 116-118  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-5G  
FSTP Lesson Plan - FFI-5G

### EQUIPMENT:

1. One of each size rope available in the department
2. Various small tools, hose or appliance, one of which must be a 2 1/2-inch hose line with nozzle

### DRILL SITE:

1. Training tower
2. Any building in which tools could be hoisted through a second-story window or higher
3. Any two-story or higher building which can be laddered and tools hoisted to the roof

### PERFORMANCE:

Select the proper rope and tie an approved knot to a designated tool, hose, or appliance and hoist it to the roof. A tail or tag line should be tied to the item or incorporated in the knot to keep it from bouncing against the wall. One of the items hoisted shall be a dry 2 1/2-inch hose line with nozzle. Restore the rope as prescribed by the department.

### STANDARDS:

1. Use the correct knot prescribed by the department.
2. Select the appropriate size and length of rope for each task.
3. At least three items should be hoisted.
4. Avoid damage to tools and equipment.
5. The rope should be restored properly.
6. Perform the task safely.
7. Perform the task swiftly.

## TASK #12 - TIGHTENING A ROPE BETWEEN TWO OBJECTS

### REFERENCE:

IFSTA 106, Pgs. 93-96, 111-115  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-5G  
FSTP Lesson Plan - FFI-5G

### EQUIPMENT:

One of each size rope available in the department.

### DRILL SITE:

Any location with two stationary objects at least fifteen feet apart.

### PERFORMANCE:

Select the proper rope and tighten it between two stationary objects at least fifteen feet apart. Restore the rope in the manner prescribed by the department.

### STANDARDS:

1. Use an approved knot or hitch as prescribed by the department.
2. The rope, when tightened, should support the weight of the firefighter.
3. Perform the task swiftly.
4. Select the proper rope for the job.
5. Properly restore the rope.

## TASK #13 - MAINTENANCE OF LADDERS

### REFERENCE:

IFSTA 102, Pgs. 1-18, 38-44  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI - 6A  
FSTP Lesson Plan - FFI - 6A

### EQUIPMENT:

All ladders used by the fire department.

### DRILL SITE:

1. Apparatus room or any area large enough to contain the ladders used by the department.

### PERFORMANCE:

The firefighter shall identify all ladders used by the department having jurisdiction and know their uses. The firefighter shall demonstrate the proper procedures for cleaning and inspecting a ladder as indicated by the training officer. This may be done by description rather than by physical means. Both wood and metal ladders should be used if available.

### STANDARDS:

1. Identify and explain the use of all ladders used by his department.
2. Describe briefly the construction of the ladder.
3. Describe the items to look for in inspection.
4. Show how to administer the twist test for a given ladder.
5. Describe how to make both minor and major repairs of ladders.

NFPA 1001 STANDARD 3-9.1, 3-9.8

## **\*TASK #14 - CLIMBING GROUND LADDERS**

### **REFERENCE:**

IFSTA 102, Pgs. 31-37  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI - 6B  
FSTP Lesson Plan - FFI - 6B

### **EQUIPMENT:**

1. Every type of ground ladder used by the department.
2. Anchor strap or rope hose tool

### **DRILL SITE:**

1. Fire department training grounds
2. Any building suitable for laddering

### **PERFORMANCE:**

When given a properly raised and anchored ground ladder, the firefighter shall correctly climb and descend its full length.

### **STANDARDS:**

1. Climb perpendicular to the ground at arm's length from the rungs.
2. Climb smoothly to reduce bouncing.
3. Focus eyes straight forward with an occasional glance to the top of the ladder.
4. Climb with legs instead of arms.
5. Never remove both hands from the ladder at the same time.
6. Perform the task safely.

\*To conserve effort, this task may be conducted in conjunction with Task #18 - Raising Short and Medium Extension Ladders, and Task #15 - Climbing Ladders Carrying Tools and Equipment.

NFPA 1001 STANDARD 3-9.4

## **\*TASK #15 - CLIMBING LADDERS CARRYING TOOLS AND EQUIPMENT**

### **REFERENCE:**

IFSTA 102, Pgs. 31-37  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI - 6B, FFI - 6G  
FSTP Lesson Plan - 6B, FFI - 6G

### **EQUIPMENT:**

1. Every type of ladder used by the fire department having jurisdiction.
2. Various firefighting tools or equipment used by the department.
3. 2 1/2-inch hose line with nozzle
4. Rope hose tool or ladder tie

### **DRILL SITE:**

1. Fire department training grounds
2. Any building suitable for laddering

### **PERFORMANCE:**

The firefighter shall select and properly raise a specified ground or aerial ladder. The firefighter shall tie off the tip of the ladder and correctly climb and descend the full length, carrying firefighting tools or equipment specified by the examiner. One item carried up must be a dry 2 1/2-inch hose line with nozzle.

### **STANDARDS:**

1. Correctly tie off the tip of the ladder.
2. Maintain hand contact with the ladder at all times.
3. Climb smoothly to reduce bouncing.
4. Climb perpendicular to the ground.
5. Focus eyes straight ahead with an occasional glance to the top of the ladder.
6. Climb with legs instead of arms.
7. Make two climbs. During one of the climbs, the firefighter shall carry a 2 1/2-inch hose line with nozzle.
8. Perform the task safely.
9. Do not abuse equipment.

\*To conserve effort, this task may be conducted in conjunction with Task #18 - Raising Short and Medium Extension Ladders, Task #14 - Climbing Ground Ladders, and Task #23 - Climbing Aerial Ladders.

## TASK #16 - LADDER CARRIES

### REFERENCE:

IF: A 102, Section 3  
F: Department Training Manual  
FSTP Subject Outline Guide - FFI-6C, FFI-6D, FFI-6F, FFI-6H  
FSTP Lesson Plan - FFI-6C, FFI-6D, FFI-6F, FFI-6F

### EQUIPMENT:

Ladder truck (if available) or triple-combination pumper equipped in the manner prescribed by the department

### DRILL SITE:

1. Fire department training grounds
2. Fire department parking lot

### PERFORMANCE:

Working as an individual or a member of a team, remove each type of ladder used by the department from its normally stored position and carry it a minimum of 100 feet. Restore ladders to their place of storage. Each individual should be tested at the command position during his demonstration.

### STANDARDS:

1. Properly remove the ladders from their place of storage.
2. Use the carry approved by the department for each type ladder.
3. Coordinate efforts with the rest of the team.
4. Properly restore the ladders to their place of storage.
5. Perform the task safely.
6. Perform the task swiftly.

NFPA 1001 STANDARD 3-9.2



## TASK #17 - RAISING STRAIGHT LADDERS

### REFERENCE:

IFSTA 102, Pgs. 47-61  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-6C, FFI-6H  
FSTP Lesson Plan - FFI-6C, FFI-6H

### EQUIPMENT:

Straight ladder (If the department does not use straight ladders, use a roof ladder.)

### DRILL SITE:

1. Fire department training grounds
2. Any building suitable for laddering

### PERFORMANCE:

Remove a straight ladder from its normally stored position and raise it using the one-man flat raise.

### STANDARDS:

1. Perform the raise correctly as prescribed by the department.
2. Position the ladder properly.
3. Obtain proper ladder angle.
4. Heel should be on firm footing.
5. Perform task safely.
6. Perform task swiftly.

## **\*TASK #18 - RAISING SHORT AND MEDIUM EXTENSION LADDERS**

### **REFERENCE:**

IFSTA 102, Pgs. 62-98  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-6C, FFI-6E  
FSTP Lesson Plan - FFI-6C, FFI-6E

### **EQUIPMENT:**

A 24 to 35-foot extension ladder stored in its normal manner in the department

### **DRILL SITE:**

1. Fire department training grounds
2. Any building suitable for laddering

### **PERFORMANCE:**

Working as an individual or as a member of a team, remove a short or medium extension ladder from its normally stored position and raise it using the following two raises:

1. Two-man flat raise at right angle to the building
2. Two-man beam raise

### **STANDARDS:**

1. Perform the raises correctly as prescribed by the department.
2. Coordinate efforts with the team members.
3. Position the ladder properly.
4. Obtain the proper ladder angle.
5. Extend the fly to the correct length.
6. Do not abuse equipment.
7. Heel shall be on firm footing.
8. Locks shall be properly seated.
9. Halyard shall be tied off.
10. Perform the task safely.
11. Perform the task swiftly.

\*To conserve effort, this task may be conducted in conjunction with Task #14 - Climbing Ground Ladders, and Task #15 - Climbing Ladders Carrying Tools and Equipment.

NFPA 1001 STANDARD 3-9.3

## **TASK #19 - BRINGING A VICTIM DOWN A LADDER**

### **REFERENCE:**

IFSTA 108, Pgs. 94-95  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-6D, FFI-11G, FFI-11J  
FSTP Lesson Plan - FFI-6D, FFI-11G, FFI-11J

### **EQUIPMENT:**

1. 24 to 35-foot extension ladder
2. Training dummy weighing at least 125 lbs. (Optional)

### **DRILL SITE:**

1. Fire department training grounds
2. Any building suitable for laddering

### **PERFORMANCE:**

Given a properly raised ladder, bring a person or a training dummy down the ladder in a manner prescribed by the department. The firefighter shall work as a member of a team with team members assisting him in placing the victim on a ladder from a roof or from inside a window.

### **STANDARDS:**

1. Correctly use a method prescribed by the department.
2. Victim should be handled in a gentle manner.
3. Perform the task safely.
4. Perform the task swiftly.
5. Victim should be brought down from a height of at least 20 feet.
6. Task should be performed with both conscious and unconscious "victims".

## **TASK #20 - RAISING EXTENSION LADDERS WITH POLES**

### **REFERENCE:**

IFSTA 102, Pgs. 99-109  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-6F  
FSTP Lesson Plan - FFI-6F

### **EQUIPMENT:**

The longest pole ladder available to the department, stored in its normal manner

### **DRILL SITE:**

1. Fire department training grounds
2. Any building suitable for laddering with long ladders

### **PERFORMANCE:**

Working as a member of a team, remove the longest pole ladder available to the department from its normally stored position and raise it, using one of the following raises:

1. Flat raise at right angle to the building
2. Flat raise parallel to the building

### **STANDARDS:**

1. Perform the raise correctly as prescribed by the department.
2. Coordinate efforts with the team members.
3. Position the ladder properly.
4. Obtain the proper ladder angle.
5. Extend the fly to the correct length.
6. Do not abuse the equipment.
7. Heel shall be on firm footing.
8. Locks shall be properly seated.
9. Halyard shall be tied off.
10. Tormentor poles shall be properly set.
11. Perform the task safely.
12. Perform the task swiftly.

NFPA 1001 STANDARD 3-9.3

## **TASK #21- WORKING FROM LADDERS WITH TOOLS AND APPLIANCES**

### **REFERENCE**

IFSTA 103, pgs. 250-252  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI - 6G  
FSTP Lesson Plan - FFI-6G

### **EQUIPMENT**

1. Every type of ladder used by the fire department having jurisdiction
2. Various firefighting tools or equipment used by the department.
3. 2 1/2 - inch charged hose line
4. Rope hose tool or ladder tie

### **DRILL SITE:**

1. Fire department training grounds
2. Any building suitable for laddering

### **PERFORMANCE:**

When given a properly raised ground or aerial ladder, the firefighter shall tie off the tip of the ladder, climb and descend the full length and, demonstrate his ability to work from the ladder with various tools and equipment. One item used must be a charged 2 1/2 - inch hose line with nozzle. Safety precautions for the climbers and the personnel on the ground shall be taken.

### **STANDARDS:**

1. Make two climbs, using approved methods as specified by the department having jurisdiction.
2. During one of the climbs, demonstrate proper use of at least two tools to gain forcible entry.
3. During one of the climbs, work as a team of two to demonstrate proper methods of advancing charged 2 1/2 - inch hose line, and place the nozzle into operation.
4. Demonstrations shall be made both on the right and left sides of the ladder.
5. Perform the task swiftly, using smooth teamwork.
6. Perform the task safely.
7. Do not abuse equipment.

NFPA 1001 STANDARD 3-7.12, 3-9.7

## TASK #22 - USE OF A LIFE BELT

### REFERENCE:

IFSTA 108, Pgs. 90-92  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-11F  
FSTP Lesson Plan - FFI-11F

### EQUIPMENT:

1. Life Belt
2. Full protective clothing
3. Life line 5/8-inch diameter or larger and 100 to 125-feet in length

### DRILL SITE:

1. Fire department training grounds
2. Any building to which a rope can be anchored at the top and which lends itself to life line practices

### PERFORMANCE:

Explain the uses of a life belt and demonstrate the ability to slide a life line from a height of at least 10 feet. Evaluators must be confident that the firefighter has adequate knowledge of the correct procedure before allowing him to perform.

### STANDARDS:

1. Demonstrate adequate knowledge of the uses of the life belt.
2. Know the procedure for sliding a life line.
3. Correctly slide a life line from a minimum of 10 feet.
4. Perform the task safely.
5. Perform the task swiftly.

NFPA 1001 STANDARD 3-12.3

## **\*TASK #23 - CLIMBING AERIAL LADDERS**

### **REFERENCE:**

IFSTA 102, Pgs. 31-37  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-6I  
FSTP Lesson Plan - FFI-6I

### **EQUIPMENT:**

Aerial ladder apparatus

### **DRILL SITE:**

1. Fire department training grounds
2. Any location which lends itself well to aerial operation

### **PERFORMANCE:**

When given a properly raised aerial ladder, the firefighter shall correctly climb the ladder to its top. Since a proper angle is many times impossible to obtain when using aerial apparatus, the firefighter should climb the ladder at several different angles. The firefighter should carry various tools or equipment as required when climbing.

### **STANDARDS:**

1. The aerial should be extended to at least 80% of its full length
2. Climb the ladder in a manner approved by the department, carrying tools or equipment as specified by the examiner.
3. Climb smoothly to reduce bouncing.
4. Focus eyes straight forward with an occasional glance to the top of the ladder.
5. Climb with the legs instead of the arms.
6. Never remove both hands from the ladder at the same time.
7. Perform the task safely.

\*To conserve effort, this task may be conducted in conjunction with Task #15  
- Climbing Ladders Carrying Tools and Equipment

NFPA 1001 STANDARD 3-9.4

## TASK #24 - IDENTIFICATION OF HOSE

### REFERENCE:

IFSTA 103, Pgs. 7-14  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-7A  
FSTP Lesson Plan - FFI-7A

### EQUIPMENT:

Paper and pencil

### DRILL SITE:

Fire department training room

### PERFORMANCE:

List on a piece of paper from memory the size, amount, location, construction and use of all the hose carried on the pumper apparatus on which the firefighter normally works. In the event the firefighter does not work on pumper apparatus, the pumper he normally works around should be used.

### STANDARDS:

1. Know the correct amount of hose in each compartment.
2. Know the correct size of hose in each compartment.
3. Know the normal use of the hose in each compartment, e.g., lay-in, stretch, etc.
4. Know the construction type of all hose carried on the apparatus.
5. Know the correct location of all hose carried on the apparatus.

NFPA 1001 STANDARD 3-7.1



## TASK # 25 - IDENTIFICATION OF HOSE APPLIANCES

### REFERENCE:

IFSTA 103, Pgs. 45-55  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-7B  
FSTP Lesson Plan - FFI-7B

### EQUIPMENT:

A triple combination pumper equipped in the manner prescribed by the department which should include as a minimum:

1. Double male and female
2. Wye
3. Siamese
4. Hydrant gate
5. Size adapters
6. Hose clamp
7. Hydrant wrench
8. Spanner wrench
9. Hose bridge
10. Rope hose tool

### DRILL SITE:

Fire department apparatus room

### PERFORMANCE:

Given the name of a particular hose appliance, the firefighter should locate the appliance where it is normally carried in the department and briefly explain or demonstrate its use. He should further explain how to inspect, clean and care for the appliance.

### STANDARDS:

1. Locate the tools swiftly.
2. Know the common uses of the appliance.
3. Explain any particular characteristics of the appliance, e.g., flow of nozzles.
4. Explain how to inspect and care for the appliance.

NFPA 1001 STANDARD 3-7.2, 3-7.5

## **TASK #26 - HOSE ROLLS**

### **REFERENCE:**

IFSTA 103, Pgs. 59-78  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-7C  
FSTP Lesson Plan - FFI-7C

### **EQUIPMENT:**

1. One length of 1 1/2 - inch hose
2. One length of 2 1/2 - inch hose

### **DRILL SITE:**

1. Fire department training grounds
2. Fire department apparatus room

### **PERFORMANCE:**

Working as an individual and with a team member, make all of the different hose rolls used by the department for storage, load finishes, hose bundles, etc.

### **STANDARDS:**

1. Make the rolls correctly as prescribed by the department.
2. The rolls shall be neat.
3. Work well as member of a team.

NFPA 1001 STANDARD 3-7.1, 3-7.8

## TASK #27 - TAKING A HYDRANT

### REFERENCE:

IFSTA 103, Pgs. 59-84, 88-103, 164-247  
Fire Department Training Manual  
FSAB Subject Outline Guide - FFI-7D  
FSAB Lesson Plan - FFI-7D

### EQUIPMENT:

Triple combination pumper equipped in the manner prescribed by the department.

### DRILL SITE:

1. Fire department training grounds
2. Any location with a suitable fire hydrant

### PERFORMANCE:

Working as a member of a company, demonstrate the ability to take a hydrant in the manner prescribed by the department. If more than one method has been adopted, demonstrate each: e.g. single line, double lines, etc.  
Reload the hose bed in the manner prescribed by the department.

### STANDARDS:

#### Taking a hydrant

1. Use the correct procedure as adopted by the department.
2. Turn the hydrant full open.
3. Make all connections water tight.
4. Perform the task safely.
5. Perform the task swiftly.

#### Reloading hose

6. Load hose correctly as prescribed by the department.
7. Load hose neatly.
8. Use the correct load finish.
9. Load the hose in a manner that it will pay out freely.
10. Correctly couple hose and nozzles on appliances.
11. Perform the task safely.

NFPA 1001 STANDARD 3-7.6, 3-7.7, 3-7.11

## TASK #28 - MAKING HYDRANT TO PUMPER CONNECTIONS

### REFERENCE:

IFSTA 103, Pgs. 104-119  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-7D  
FSTP Lesson Plan - FFI-7D

### EQUIPMENT:

Triple combination pumper equipped in the manner prescribed by the department

### DRILL SITE:

1. Fire department training grounds
2. Any hydrant suitable for connection in all of the manners prescribed by the department

### PERFORMANCE:

Given a properly positioned pumper, make all the different hydrant-pumper connections prescribed by the department; e.g. hard suction connection, steamer to soft suction connection, 2 1/2 - inch soft suction connections, etc.

### STANDARDS:

1. Perform the tasks correctly using the method prescribed by the department.
2. Make connections swiftly.
3. Avoid damage to hose, appliances or apparatus.
4. Perform the task safely.

NFPA 1001 STANDARD 3-7.6

**TASK #29 - CARRYING, DRAGGING, OR LOADING  
A SINGLE SECTION OF HOSE LINE**

**REFERENCE:**

IFSTA 103, Pgs. 125-158  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-7E, FFI-7F, FFI-7G, FFI-7H  
FSTP Lesson Plan - FFI-7E, FFI-7F, FFI-7G, FFI-7H

**EQUIPMENT:**

1. One section of 1 1/2-inch hose line
2. One section of 2 1/2-inch hose line

**DRILL SITE:**

1. Fire department training grounds
2. Fire department apparatus room

**PERFORMANCE:**

The firefighter shall properly carry or drag a single length of 1 1/2-inch hose and 2 1/2-inch hose in a manner prescribed by the department having jurisdiction. The firefighter shall further load hose on the apparatus as prescribed by the department having jurisdiction, and shall be able to identify and explain the purpose of at least three types of loads and finishes.

**STANDARDS:**

1. Correctly demonstrate two hose carries as specified by the examiner.
2. Correctly demonstrate two hose drags as specified by the examiner.
3. Correctly demonstrate the loading of fire hose on the apparatus as used by the department having jurisdiction.
4. Perform all tasks swiftly and smoothly.
5. Perform all tasks safely.
6. Avoid abuse or damage to hose.
7. Demonstrate the ability to correctly identify at least three types of loads and finishes, and be able to explain the purposes of each.

**NFPA 1001 STANDARD 3-7.7, 3-7.9, 3-7.10**

## TASK #30 - EXTENDING AND REPLACING A SECTION OF HOSE LINE

### REFERENCE:

IFSTA 103, Pgs. 153-158  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-7E  
FSTP Lesson Plan - FFI-7E

### EQUIPMENT:

1. At least 150 feet of 1 1/2-inch or 2 1/2-inch hose line, charged
2. Two additional sections of 1 1/2-inch or 2 1/2-inch hose line

### DRILL SITE:

1. Fire department training grounds
2. Any area suitable for hose evolutions

### PERFORMANCE:

The firefighter shall properly demonstrate approved methods of using appliances to extend a hose line or replace a burst section of hose. For extension the firefighter must shut off the line, attach the extension, and restore water to the hose. For a burst hose, the firefighter must demonstrate replacement of the burst section with two sections and explain the reason.

### STANDARDS:

#### Extending a Hose Line

1. Demonstrate the methods prescribed by the department having jurisdiction for extending a hose line that is too short.
2. Use the proper appliance
3. Perform the job quickly
4. Perform the job safely

#### Replacing a Burst Section of Hose Line

1. Demonstrate the method used by the department having jurisdiction for replacing a burst section of hose line.
2. Use the proper appliance
3. Perform the job quickly
4. Perform the job safely

NFPA 1001 STANDARD 3-7.14

## TASK #31 - ADVANCING HOSE LINES

### REFERENCE:

IFSTA 103, Pgs. 159-246  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-7F, FFI-7G, FFI-7H, FFI-7I, FFI-7J  
FSTP Lesson Plan - FFI-7F, FFI-7G, FFI-7H, FFI-7I, FFI-7J

### EQUIPMENT:

Triple combination pumper equipped in the manner prescribed by the department

### DRILL SITE:

Fire department training grounds

### PERFORMANCE:

Advance hose in the following manner:

1. Advance a booster line a minimum of 150 feet.
2. Advance hose to place a 1 1/2-inch line in service a minimum of 250 feet from the apparatus.
3. Advance hose to place a 2 1/2-inch line in service a minimum of 250 feet from the apparatus.

### STANDARDS:

#### Advancing hose

1. The stretched hose line shall be free of kinks, knots, and sharp bends.
2. Correctly perform the tasks in a manner prescribed by the department.
3. Perform the task safely.
4. Perform the task swiftly.

#### Reloading hose

1. Reload the hose correctly as prescribed by the department.
2. Reload the hose neatly.
3. Make couplings smoothly and correctly.

NFPA 1001 STANDARD 3-7.11

## TASK # 32 - ADVANCING DRY HOSE UP A STAIRWAY

### REFERENCE:

IFSTA 103, Pgs. 248-250  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-7J  
FSTP Lesson Plan - FFI-7J

### EQUIPMENT:

Triple combination pumper equipped in the manner prescribed by the department

### DRILL SITE:

1. Fire department training tower
2. Any building with a stairway in which a dry hose can be advanced up or down the stairs

### PERFORMANCE:

Pull a 1 1/2-inch pre-connect from the pumper and advance it up or down a stairway in the manner prescribed by the department. Restore the hose line.

### STANDARDS:

#### Stretch

1. When the stretch is complete, the line shall be free of kinks, knots, and sharp bends.
2. Correctly perform the task in the manner prescribed by the department.
3. On an open stairway, none of the line shall hang over the edge of the steps.
4. Perform the task safely.
5. Perform the task swiftly.

#### Reloading hose

1. Load the hose correctly as prescribed by the department.
2. Load the hose neatly.
3. Make couplings smoothly and correctly.

NFPA 1001 STANDARD 3-7.3, 3-7.7



## TASK #33 - ADVANCING A DRY HOSE LINE INTO A STRUCTURE

### REFERENCE:

IFSTA 103, Pgs. 165-247  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-7J  
FSTP Lesson Plan - FFI-7J

### EQUIPMENT:

Triple combination pumper equipped in the manner prescribed by the department

### DRILL SITE:

1. Fire department training grounds
2. Fire station

### PERFORMANCE:

Pull a 1 1/2-inch pre-connect from the pumper and advance it into a structure in the manner prescribed by the department. A minimum of 50 feet of line should be inside the door when the stretch is complete. Reload the hose as prescribed by the department.

### STANDARDS:

#### Stretch

1. When the stretch is complete, the line shall be free of kinks, knots, and sharp bends.
2. Correctly perform the task in the manner prescribed by the department.
3. Perform the task safely.
4. Perform the task swiftly.

#### Reloading hose

1. Load the hose correctly as prescribed by the department.
2. Load the hose neatly.
3. Make couplings smoothly and correctly.
4. Perform the task safely.

NFPA 1001 STANDARD 3-7.7

## Task #34 - SALVAGE AND OVERHAUL PROCEDURES

### REFERENCE:

IFSTA 104-Pgs. 3-12  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-8A, FFI-8F  
FSTP Lesson Plan - FFI-8A, FFI-8F

### DRILL SITE

1. Any appropriate room in the fire station.

### PERFORMANCE:

The firefighter must be able to define the functions of salvage and overhaul, and their value to the fire service as well as the community.

### STANDARDS:

#### Salvage

1. Define salvage
2. Give at least two examples of situations in which salvage procedures could or could not be effective.

#### Overhaul

1. Define overhaul
2. Explain why overhaul is a necessity
3. Give at least two examples of effective overhaul.

NFPA 1001 STANDARD 3-6.1

## TASK #35 - SALVAGE COVER THROWS

### REFERENCE:

IFSTA 104, Pgs. 29-68  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-8B  
FSTP Lesson Plan - FFI-8B

### EQUIPMENT:

1. Salvage cover stored in the manner prescribed by the department
2. The furniture normally contained in one room

### DRILL SITE:

1. Any desirable room in the fire station
2. Fire department training grounds

### PERFORMANCE:

Working with a partner, group the furniture from one room as would be done at a fire scene and cover them with a salvage cover, using a one-man spread and a two-man throw. Demonstrate a correct method of removing the salvage cover. Restore the salvage cover in the manner prescribed by the department.

### STANDARDS:

1. Avoid placing grouped furniture under light fixtures or other places which commonly leak water.
2. Use care in handling furniture.
3. If possible, make a peak with furniture so that water will run off the cover easily.
4. Correctly use a one-man spread approved by the department.
5. Correctly use a two-man throw or spread approved by the department.
6. Fold covers off to avoid damage to furniture or the salvage cover.
7. Restore the salvage cover in the manner prescribed by the department.
8. Perform task swiftly.
9. Perform task safely.

NFPA 1001 STANDARD 3-6.2, 3-6.3

## TASK #36 - CARE AND MAINTENANCE OF SALVAGE COVERS

### REFERENCE:

IFSTA 104, Pgs. 13-17  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-8C  
FSTP Lesson Plan - FFI-8C

### EQUIPMENT:

1. Salvage covers
2. Cleaning materials as specified by department having jurisdiction
3. Repair kit as specified by department having jurisdiction

### DRILL SITE:

1. Fire department apparatus or training room
2. Fire department training grounds

### PERFORMANCE:

The firefighter shall describe approved methods of inspecting, cleaning and drying salvage covers, and the reasons for the methods used.

### STANDARDS:

1. Demonstrate knowledge of inspecting, cleaning, and drying procedures as specified by the department having jurisdiction.
2. Demonstrate knowledge of repair procedures as specified by the department having jurisdiction.
3. Demonstrate knowledge of test procedures used for salvage covers.

NFPA 1001 STANDARD 3-6.4

## TASK #37 - CONSTRUCTING A WATER CHUTE

### REFERENCE:

IFSTA 104, Pgs. 29-34, 39, 46-52, 69-70, 73-75  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-8E  
FSTP Lesson Plan - FFI-8E

### EQUIPMENT:

1. Two salvage covers
2. 24-foot extension ladder
3. Various other equipment normally available in the department

### DRILL SITE:

1. Fire department training grounds
2. Fire department training room

### PERFORMANCE:

Working with a partner, splice two salvage covers together and construct a water chute supported by a ladder. Using available materials and equipment, support the water chute as if to route water out of the building. Restore the salvage covers as prescribed by the department.

### STANDARDS:

1. Construct a water chute in a manner prescribed by the department.
2. Splice covers in a manner that one may be dragged by the other.
3. Edges of the chute should not hang over the beams of the ladder.
4. If evaluators are in doubt as to whether the chute will channel water, they should run water from a garden hose into the chute for a minimum of five minutes to test its construction.
5. Restore the salvage covers in a manner prescribed by the department.

NFPA 1001 STANDARD 3-6.4

## TASK #38 - CONSTRUCTION OF A WATER CATCH-ALL

### REFERENCE:

IFSTA 404, Pgs. 70-72  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-8E  
FSTP Lesson Plan - FFI-8E

### EQUIPMENT:

Salvage cover

### DRILL SITE:

1. Fire department training grounds
2. Fire department parking lot
3. A water source adequate to fill the catch-all is necessary.

### PERFORMANCE:

Using a salvage cover, construct a small catch-all in a manner prescribed by the department and fill it two-thirds full of water.

### STANDARDS:

1. Construct the catch-all in a manner prescribed by the department.
2. The catch-all shall hold for five minutes with no sign of weakening.
3. Perform the task swiftly.

## TASK #39 - REMOVAL OF WATER WITHOUT SALVAGE COVERS

### REFERENCE:

IFSTA 104, Pgs. 76-77  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-8E  
FSTP Lesson Plan - FFI-8E

### EQUIPMENT:

All equipment normally available in the department

### DRILL SITE:

1. Fire department training grounds
2. Fire department training room

### PERFORMANCE:

Demonstrate the ability to confine water to a room, then carry or route it out of the building, using any equipment available except salvage covers. If a drill site is used where water damage may result, the task must be demonstrated by simulation.

### STANDARDS:

1. The firefighter should choose his own equipment and technique of water control and removal.
2. If water is used, it should be successfully controlled and removed from the building. Twenty-five to fifty gallons will be adequate in most instances.
3. Perform the task swiftly.
4. Perform the task safely.

## TASK #40 - DEFINING A FIRE STREAM

### REFERENCE:

IFSTA 105, Pgs. 3-19, 37-41  
IFSTA 107, Pgs. 106-110  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-9A  
FSTP Lesson Plan - FFI-9A

### EQUIPMENT:

1. Paper, writing or drawing materials
2. 1½-inch hose and nozzle, charged
3. Water Supply

### DRILL SITE:

Fire department training grounds or similar area

### PERFORMANCE:

Define a fire stream. The definition should include a complete explanation of the factors which affect the stream from the time the water leaves the nozzle until it arrives on the fire. This includes those elements affecting the stream and those elements producing a good fire control stream. Define "direct", "indirect", and "combination" fog applications.

### STANDARDS:

1. Demonstrate knowledge of the use of an effective fire stream.
2. Demonstrate or describe the proper use of "indirect" application, "direct" application, and "combination" application of water fog.
3. Demonstrate or describe fire streams clearly and without hesitation.

NFPA 1001 STANDARD 3-8.1



## TASK #41 - STEPS TO AVOID WATER HAMMER

### REFERENCE:

IFSTA 402, Pg. 48  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-9B  
FSTP Lesson Plan - FFI-9B

### EQUIPMENT:

1. A charged 1½ or 2½-inch hose line with nozzle
2. Fire department pumper or operational hydrant

### DRILL SITE:

Fire department training grounds

### PERFORMANCE:

Define water hammer and at least one method for its prevention. The trainee, by knowing what causes this condition, can easily define steps to prevent its occurrence.

### STANDARDS:

1. Define water hammer clearly, explaining the hazards.
2. Demonstrate the ability to avoid water hammer by using both the charged line and the pump or hydrant.
3. Perform the task quickly and without hesitation.

NFPA 1001 STANDARD 3-8.3, 3-8.4

## TASK #42 - FIRE STREAMS

### REFERENCE:

IFSTA 105, Pgs. 37-67  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-9C  
FSTP Lesson Plan - FFI-9C

### EQUIPMENT:

Paper, writing materials

### DRILL SITE:

Classroom

### PERFORMANCE:

Explain the kind and use of every type of nozzle used by the department having jurisdiction. Be able to describe the difference between solid streams and fog streams, and what factors influence their effectiveness.

### STANDARDS:

1. List, from memory, the kinds of nozzles used by the department having jurisdiction.
2. Describe the difference between solid stream nozzles and fog stream nozzles.
3. Demonstrate knowledge of types of fire streams and their effectiveness.

## TASK #43 - ATTACKING CLASS "A" FIRES WITH WATER FOG

### REFERENCE:

IFSTA 105, Pgs. 37-53, 131-151  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-9G, FFI-9I  
FSTP Lesson Plan - FFI-9G, FFI-9I

### EQUIPMENT:

1. Triple-combination pumper equipped in the manner prescribed by the department
2. Full protective clothing for firefighter and evaluators
3. Breathing apparatus for fire fighter and evaluators
4. Adequate water supply
5. Back-up crew

### DRILL SITE:

1. An abandoned house awaiting demolition. (This is best since it is probably relatively unfamiliar to the firefighter and situated similar to most of the fires the firefighter will experience. The house need not be burned to the ground. Small interior fires can be set and extinguished many times in the same building without exposing other buildings in the area.)
2. Fire department smoke house

### PERFORMANCE:

Demonstrate the ability to manipulate a nozzle so as to extinguish a Class "A" fire. A small interior fire should be set inside an enclosed room. With a back-up crew standing by for immediate attack if necessary, let the fire progress to an appropriate level under constant supervision. While wearing full protective clothing and breathing apparatus, the firefighter shall enter the building to attack and extinguish the fire.

### STANDARDS:

1. Use the correct attack for the particular fire.
2. Use the proper nozzle pattern.
3. Use water efficiently.
4. Shut down the nozzle as soon as the fire is blacked out.
5. Be familiar with nozzle operation.
6. Do not restrict ventilation with improper nozzle pattern or use.
7. Perform evolution safely and swiftly.

NFPA 1001 STANDARDS 3-7.4, 3-8.2

## TASK #44 - ATTACKING CLASS "B" FIRES WITH WATER FOG

### REFERENCE:

IFSTA 105, Pgs. 149-150  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-9G, FFI-9I  
FSTP Lesson Plan - FFI-9G, FFI-9I

### EQUIPMENT:

1. A pan or pit approximately 6-feet square
2. Diesel fuel
3. A triple combination pumper
4. Two 1 1/2-inch lines with fog nozzles of appropriate length
5. Full protective clothing

### DRILL SITE:

Fire department training grounds

### \*PERFORMANCE:

Demonstrate the ability to extinguish a small Class "B" fire using water fog. Fill the pan or pit with 1 to 2 inches of diesel fuel and ignite it. Use a 1 1/2-inch lines with fog stream to extinguish it.

### STANDARDS:

1. Use correct attack.
2. Use proper nozzle pattern.
3. Be familiar with nozzle operation.
4. Use water efficiently.
5. Do not overflow pan, spreading fuel or fire.
6. Perform the task safely.
7. Perform the task swiftly.

\*This task is an adequate evaluation considering the expense and availability of equipment used in an oil fire school. If resources are available, it is recommended that the firefighter attend an accredited oil fire school in lieu of this task.

NFPA 1001 STANDARD 3-8.2

## TASK #45 - USING A PITOT TUBE AND GUAGE

### REFERENCE:

IFSTA 105, pg. 177  
Fire Department Training Manual  
FSTP Subject Outline Guide, FFI-9H  
FSTP Lesson Plan, FFI-9H

### EQUIPMENT:

1. Pitot tube and guage
2. Operational hydrant

### DRILL SITE:

Fire department training grounds or any area where operating hydrant is available.

### PERFORMANCE:

The firefighter shall demonstrate the proper use of a Pitot tube and guage as used in determining water flow.

### STANDARDS:

1. Demonstrate approved procedure for using Pitot tube and guage.
2. Explain proper procedures necessary to obtain accurate reading.
3. Demonstrate and explain proper procedure necessary to leave Pitot tube and guage ready and accurate for subsequent hydrant tests.
4. Perform the task swifly and without hesitation.

## TASK # 46- APPLICATION OF FOAM

### REFERENCE:

IFSTA 105, Pgs. 179-183  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-9J  
FSTP Lesson Plan - FFI-9J

### EQUIPMENT:

1. Pumper
2. Foam equipment as used by department having jurisdiction
3. Burn barrel for flammable liquids
4. Full protective clothing for each participant

### DRILL SITE:

1. Fire department training ground or other suitable area.

### PERFORMANCE:

Demonstrate the use of the foam equipment used by the department having jurisdiction.

### STANDARDS:

1. Demonstrate the method of connecting all parts of foam equipment, as specified by the department having jurisdiction.
2. Demonstrate the proper method of applying foam to a flammable liquid fire.
3. Perform the task swiftly.
4. Perform the task safely.

## TASK # 47 - VENTILATING A ROOF USING A FIRE AXE

### REFERENCE:

IFSTA 101, Pgs. 52-63  
IFSTA 107, Pgs. 86-97  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-10F  
FSTP Lesson Plan - FFI-10F

### EQUIPMENT:

1. Fire axe
2. Extension ladder
3. Roof ladder
4. Rope hose tool or ladder ties
5. Pike pole

### DRILL SITE:

- \*1. An abandoned building awaiting demolition
2. Fire department training grounds

### PERFORMANCE:

Demonstrate the ability to cut a ventilation hole of proper size in a roof using a fire axe. If necessary, break a hole of adequate size in the ceiling directly below the ventilation hole to allow ventilation.

### STANDARDS:

1. Follow accepted cutting procedures.
2. Select proper site for hole.
3. Do not cut rafters.
4. Cut hole at least 16 square feet in size.
5. Perform the task safely.
6. Perform the task swiftly.

\*If an abandoned building is not available, go through the entire procedure but simulate the cuts.

NFPA 1001 STANDARD 3-10.5

## TASK #48 - VENTILATION USING WATER FOG

### REFERENCE:

IFSTA 107, Pgs. 110-112  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-10H  
FSTP Lesson Plan - FFI-10H

### EQUIPMENT:

One pumper with 1 1/2-inch line and adjustable fog nozzle

### DRILL SITE:

1. Fire department training grounds
2. An abandoned building awaiting demolition
3. A masonry building with a suitable window, not susceptible to water damage.

### PERFORMANCE:

Pull a 1 1/2-inch line from a pumper and demonstrate the ability to ventilate a building by projecting a fog stream through an open door or window.

### STANDARDS:

1. Fill the opening as nearly as possible.
2. Minimize overspray inside building.
3. Perform the task safely.
4. Perform the task swiftly.
5. Use a proper pattern for the particular opening.



## TASK #49 - VENTILATION USING AN EXHAUST FAN

### REFERENCE:

IFSTA 107, Pgs. 113-119  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-10I, FFI-10J  
FSTP Lesson Plan - FFI-10I, FFI-10J

### EQUIPMENT:

1. Exhaust fan
2. Fan hanger, if available in the department
3. Attic or folding extension ladder
3. Plastic film or salvage cover with staple gun or tape
5. Rope hose tool or lash line
6. Any other equipment available in the department, used for forced ventilation

### DRILL SITE:

1. Fire department training grounds
2. Fire department training room

### PERFORMANCE:

Hang an exhaust fan in a doorway and seal the open space around it with plastic film or a salvage cover. A door or window on the opposite side of the room should be opened to create air flow.

### STANDARDS:

1. Fan should be hung as high in the opening as possible.
2. Fan should hang unattended.
3. Plastic film or salvage cover should hang unattended.
4. Firefighter should be familiar with the total power supply system.
5. No damage should result to the building.
6. Perform task safely.
7. Perform task swiftly.

## TASK #50 - CONSTRUCT A SMOKE TUBE

### REFERENCE:

IFSTA 107, Pgs. 113-119  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-10I, FFI-10J  
FSTP Lesson Plan - FFI-10I, FFI-10J

### EQUIPMENT:

1. Exhaust fan
2. Smoke tube
3. Attic ladder or folding extension ladder
4. Lash line or rope hose tool

### DRILL SITE:

1. Fire department training grounds
2. Fire department training room

### PERFORMANCE:

Demonstrate the construction of a smoke tube to exhaust air from a closed room to the outside. A closed room can be simulated by closing all doors and windows except the one from which the smoke tube is running out.

### STANDARDS:

1. The smoke tube should hold together during operation for at least five minutes.
2. The exhaust fan should be placed in a rear corner as high as possible.
3. The fan should hand independently.
4. The firefighter should be familiar with the method of turning the fan on and off.
5. The firefighter should properly construct the smoke tube.
6. The firefighter should properly route the tube so as to exhaust smoke to the outside.
7. Perform the task safely.
8. Perform the task swiftly.

## TASK #51 - USE OF BREATHING APPARATUS

### REFERENCE:

IFSTA 108, Pgs. 25-46  
Fire Department Training Manual  
FSTP Subject Outline+Guide - FFI-11B  
FSTP Lesson Plan - FFI-11B

### EQUIPMENT:

1. Two sets of breathing apparatus stored in the manner adopted by the department
2. Extra air bottles as required
3. Two ropes 3/8 to 5/8-inch diameters, 100 to 125-feet in length
- \*4. Smoke bombs or other means of producing smoke
5. Two hand lanterns
6. Full protective clothing

### DRILL SITE:

1. Fire department smoke house
2. A house awaiting demolition. (The building may be made suitable by closing up all doors and windows so it will hold smoke. Black out all windows to further darken the building.)

### PERFORMANCE:

Demonstrate the donning of breathing apparatus from the position in which it is stored. Demonstrate the use of all types of breathing apparatus used by the department in a dense smoke atmosphere. One evaluator should accompany the firefighter and observe him moving about the room by low crawling on the stomach, crawling on hands and knees, and walking as if to be searching the room.

### STANDARDS:

1. Apparatus should be put on in proper sequence
2. Apparatus should be put on without abusing or damaging the equipment
3. All straps should be snug
4. Apparatus should be donned in a safe manner
5. Mask should make a tight seal
6. If valves are equipped with locks, they should be used
7. Apparatus should be donned swiftly
8. Move about freely while wearing breathing apparatus
9. Maintain a tight mask seal while low crawling, crawling on hands and knees, and walking for a minimum of five minutes.
10. Demonstrate the ability to control breathing
11. Be free from signs of claustrophobia

\*A dense smoke atmosphere can be created by setting a fire of diesel fuel and straw in a 55-gallon drum.

## TASK #52 - INSPECTION AND CARE OF BREATHING APPARATUS

### REFERENCE:

IFSTA 108, Pgs. 46-47  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-11C  
FSTP Lesson Plan - FFI-11C

### EQUIPMENT:

- \*1. A complete set of breathing apparatus
2. Bubble soap
3. Wash basin, soft wash cloth, and soft towel
4. Cleaning soap or detergent approved by the department
5. Equipment wrench

### DRILL SITE:

Fire department training room

### PERFORMANCE:

Demonstrate inspection of breathing apparatus including cleanliness, wear, low pressure, leaking valves, stems and lines. Test apparatus for proper performance including regulator, by-pass, and mask. Demonstrate the proper method of cleaning the mask and drying. Store the breathing apparatus as prescribed by the department.

### STANDARDS:

1. Inspection will be thorough.
2. Cleaning will be thorough.
3. If any problems are noted by evaluators in the equipment, the firefighter should detect the same problem.
4. Apparatus should be properly re-stored in the manner prescribed by the department.
5. All straps should be loosened all the way before storage.

\*Preferably one with a leak or other deficiency.

NFPA 1001 STANDARD 3-3.5, 3-3.6

## TASK #53- EMERGENCY BREATHING

### REFERENCE:

IFSTA 108, Pgs. 28-29  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-11D  
FSTP Lesson Plan - FFI-11D

### EQUIPMENT:

Two complete sets of breathing apparatus of the same type

### DRILL SITE:

1. Fire department training room
2. Fire department training grounds

### PERFORMANCE:

Demonstrate the ability to assist another firefighter if his or your breathing apparatus fails or if the air supply is depleted. First use two masks, breathing from one regulator to simulate the failure of one tank or regulator. Next use one mask and tank to support two persons to simulate mask damage or failure, or rescue of a person with no breathing apparatus. Firefighters should be crawling in full protective clothing while buddy breathing. Also demonstrate the ability to breathe using the by-pass valve with the main line valve shut off to simulate regulator failure.

### STANDARDS:

#### Buddy Breathing

1. Make a smooth transition from normal operation to emergency procedure.
2. Always exhale into mask to clear contaminated gases before inhaling from breathing apparatus.
3. The firefighter shall buddy breathe for a minimum of five minutes.
4. Demonstrate a smooth rhythm of sharing air.

#### Using By-Pass

5. A minimum flow should be used to conserve air.
6. The firefighter should breathe using the by-pass valve for a minimum of five minutes.

NFPA 1001 STANDARDS 3-3.3, 3-15.2

## TASK #54 - RAISING AND LOWERING A VICTIM

### REFERENCE:

IFSTA 108, Pgs. 65-92  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-11F  
FSTP Lesson Plan - FFI-11F

### EQUIPMENT:

1. 125-foot rope as used by the department having jurisdiction
2. Volunteer "victim" or 125-pound dummy
3. Stretcher
4. 24-foot extension ladder (or longer)
5. Blanket or other suitable covering for "victim"

### PERFORMANCE:

Using the proper size rope, tie the appropriate knot to be used in raising or lowering a victim on a stretcher, in both the horizontal and the vertical positions. Use proper rescue procedures in the process.

### STANDARDS:

1. Select the correct rope for the knot(s) to be used.
2. Knots should be tied correctly.
3. Place victim on stretcher carefully.
4. Demonstrate proper procedures for lashing victim securely to stretcher.
5. Using the ladder, demonstrate proper procedures for raising or lowering a victim on a stretcher, both horizontally and vertically.
6. Knots should be able to be untied swiftly so rescuers can transfer victim swiftly and safely to ambulance or other rescue vehicle.
7. Victim should be raised and lowered from a height or depth of at least 20 feet.
8. This rescue procedure should be accomplished swiftly and smoothly.

## TASK #55 - RESCUE DRAGS AND CARRIES

### REFERENCE:

IFSTA 108, Pgs. 93-105  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-11G  
FSTP Lesson Plan - FFI-11G

### EQUIPMENT:

Any equipment prescribed by the individual department for use with one-man carries or drags

### DRILL SITE:

1. Fire department training room
2. Fire department training grounds

### PERFORMANCE:

Perform a two-man carry and a one-man drag as prescribed by the individual department. The victim should simulate being unconscious and should not assist the efforts of his rescuers.

### STANDARDS:

1. Carry or drag the person a minimum of 50 feet.
2. Handle the victim in a gentle manner.
3. Correctly use methods prescribed by the department.
4. Perform the task safely.
5. Perform the task swiftly.

NFPA 1001 STANDARD 3-12.1

## TASK #56 - SEARCHING FOR VICTIMS

### REFERENCE:

IFSTA 108, Pgs. 119-122  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-11G  
FSTP Lesson Plan - FFI-11G

### EQUIPMENT:

1. Full protective clothing
2. Full protective breathing apparatus with blinded mask. (The mask can be blinded by taping a rag over the facepiece.)
3. Two 3/8 to 5/8-inch ropes, 100 to 125-feet in length or 1 1/2-inch or 2 1/2-inch hose lines.
4. 125-lb. dummy or volunteer "victim"

### DRILL SITE:

1. Any selected room of adequate size in the fire station
2. Fire department smoke house

### PERFORMANCE:

Working as a member of a two-man team, the firefighter shall systematically search a large room or smoke house for victims. The firefighter shall wear full protective clothing and breathing apparatus with blinded mask. Place one victim in the room for the rescuers to locate and remove.

### STANDARDS:

1. Conduct search in a systematic manner.
2. Conduct search in a thorough manner.
3. Locate victim.
4. Remove victim in a safe, gentle manner.
5. Coordinate efforts with team member.
6. Perform the task swiftly.
7. Perform the task safely.

NFPA 1001 STANDARD 3-12.2



## TASK #57 - STRETCHER IMPROVISATION AND CARRY

### REFERENCE:

IFSTA 108, Pgs. 108-116  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-11H  
FSTP Lesson Plan - FFI-11H

### EQUIPMENT:

1. Pike poles
2. Blankets or sheets
3. Rope
4. Stretcher
5. Backboards
6. 125-pound dummy or volunteer "victim"

### DRILL SITE:

1. Fire department training ground
2. Any area suitable for constructing an obstacle course for participants carrying stretcher with victim

### PERFORMANCE:

Working in teams of four, participants will explain and demonstrate how to improvise a stretcher. They will then lift the victim, place victim on the improvised stretcher, and carry victim safely and carefully through the obstacle course provided.

### STANDARDS:

1. Using tools and materials available, teams of four shall improvise a stretcher.
2. The victim shall be placed on the stretcher in an approved manner.
3. The team shall demonstrate proper procedures for lifting stretcher with victim, and carry stretcher with victim through the obstacle course.
4. Stretcher shall be kept in as level a position as possible.
5. Victim shall be treated gently and carefully.
6. The task shall be performed swiftly and smoothly.

## TASK #58 - SIZE-UP OF RESCUE SITUATIONS

### REFERENCE:

IFSTA 108, Pgs. 127-144  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-11J  
FSTP Lesson Plan - FFI-11J

### EQUIPMENT:

All rescue or safety equipment used by the department having jurisdiction

### DRILL SITE:

1. Fire department classroom
2. Fire department apparatus room

### PERFORMANCE:

Explain the use of any rescue or safety equipment used by the department having jurisdiction.

### STANDARDS:

1. Given the following situations, the student shall explain what rescue or safety equipment might be used, and how it would affect the rescue:
  - burning building
  - demolished building
  - gaseous areas
  - electrical contact
  - earth openings
  - underwater
2. Explain clearly the proper use of each piece of rescue or safety equipment

NFPA 1001 STANDARD 3-15.4

## TASK #59 - DETERMINING FIRE CAUSE

### REFERENCE:

IFSTA 110, Pgs. 9-10  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-12F  
FSTP Lesson Plan - FFI-12F

### EQUIPMENT:

1. Pencil, paper
2. Case study of a particular fire

### DRILL SITE:

1. Classroom

### PERFORMANCE:

The firefighter shall use the information on the case study to develop an analysis of fire cause.

### STANDARDS:

1. The firefighter shall demonstrate his ability to use the "guides" used in FFI-12F to get results as to fire cause.
2. The firefighter shall discuss this information with classmates to see if he has reached a logical conclusion.

## TASK #60 - USE OF RADIO PROCEDURES

### REFERENCE:

Fire Protection Handbook, 9-34, 9-41  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-13A, FFI-13B  
FSTP Lesson Plan - FFI-13A, FFI-13B

### EQUIPMENT:

Communications equipment as used by the department having jurisdiction.

### DRILL SITE:

Fire Department Communications Room or Watch Station

### PERFORMANCE:

Given the communications equipment used by the department, the firefighter shall dispatch a call or respond to a communication in the manner prescribed by his department standard operating procedures.

### STANDARDS:

1. The firefighter shall demonstrate knowledge of the process used for a citizen to report a fire or other emergency.
2. The firefighter shall demonstrate knowledge of how to receive an alarm or report of emergency, and what action should be taken.
3. The firefighter shall describe the purpose and manner of operation of all alarm receiving instruments and personnel alerting equipment provided in his department.
4. The firefighter shall demonstrate department watch duties as specified by their standard operating procedures.
5. The firefighter shall demonstrate the use of any special traffic control devices if used by his department.
6. The firefighter shall demonstrate his ability to carry out radio procedures confidently and calmly, according to the standard operating procedures of his department.

NFPA 1001 STANDARD 3-14.1, 3-14.2, 3-14.3, 3-14.4, 3-14.5, 3-14.6, 3-14.7  
3-14.8, 3-14.9

## TASK #61 - SPRINKLER SYSTEMS

### REFERENCE:

IFSTA 103, Pgs. 120-133

Fire Department Support of Automatic Sprinkler Systems

Fire Department Training Manual

FSTP Subject Outline Guide - FFI-7D, FFI-8D, FFI-8G, FFI-14C

FSTP Lesson Plan - FFI-7D, FFI-8D, FFI-8G, FFI-14C

### EQUIPMENT:

1. Triple combination pumper equipped in the manner prescribed by the department having jurisdiction
2. Sprinkler stops

### DRILL SITE:

Any building which has a standard sprinkler system. If the system is supervised electronically, notify the agency prior to this task to avoid a possible alarm. Most F.D.C.'s which have frangible caps can usually be opened using a wrench and screwdriver prior to this task to avoid breaking them.

### PERFORMANCE:

1. Identify a fire department sprinkler connection and make connection to it as prescribed by the department.
2. Identify and operate the main control valve for the system from "open" to "closed" and then back to "open".
3. Demonstrate how to temporarily stop the flow of water from an open sprinkler head.

### STANDARD:

1. Identify F.D.C. swiftly.
2. Make proper connection.
3. Explain the method of removing caps from F.D.C.
4. Identify the main control valve.
5. Properly close and open the valve.
6. Properly demonstrate how to use each type of sprinkler stop carried in the department.

NFPA 1001 STANDARD 3-13.1, 3-13.2, 3-13.3, 3-13.4

## **TASK #62 - STANDPIPE SYSTEMS**

### **REFERENCE:**

IFSTA 205, Pgs. 103-111  
Automatic Sprinkler and Standpipe Systems  
Fire Department Training Manual  
FSTP Subject Outline Guide - FFI-14C  
FSTP Lesson Plan - FFI-14C

### **EQUIPMENT:**

1. Triple combination pumper equipped in the manner prescribed by the department having jurisdiction

### **DRILL SITE:**

Any building having a standard standpipe system.

### **PERFORMANCE:**

Identify a fire department standpipe connection and make connection to it in the manner prescribed by the department having jurisdiction. Demonstrate the manner of operation of the standpipe system, or the manner of hookup if hose loads are carried to the interior standpipes.

### **STANDARDS:**

1. Identify the F.D.C. swiftly.
2. Make proper connection from pumper.
3. Explain method of removing caps from F.D.C.
4. Make hookup or otherwise make standpipe operational on the "fire floor" in manner approved by fire department having jurisdiction.
5. Properly open and close the valve on the "fire floor".
6. Properly demonstrate the approved method of draining and restoring the system after use.