International Association of Fire Chiefs

National Fire Protection Association

Chapter 13 Preincident Planning and Code Enforcement (Fire Officer I)

Fire Officer I Objectives

- Discuss the fire officer's role in community fire safety.
- Discuss the purpose of preincident planning and list the relevant factors to consider.
- Discuss the types of fire codes and their use.

Fire Officer I Objectives

- Discuss the purpose and function of built-in fire protection systems.
- Discuss the purpose and process of a fire code compliance inspection.
- Discuss the classification of buildings by occupancy.

Fire Officer I Objectives

- Describe how to prepare for an inspection.
- Describe how to conduct an inspection.
- Discuss the creation and use of the written inspection/correction report.

Fire Officer I Objectives

- Identify general inspection requirements.
- Identify groups and their specific concerns.

Introduction

- If a building is burning, damaged, or expelling hazardous materials, the fire officer is expected to:
  - Command the incident.
  - Rescue those in harm's way.
  - Mitigate the situation.
  - Render the scene safe.

Introduction

- The fire officer looks at a building from two perspectives:
  - Preparing to handle an emergency by developing a preincident plan
  - Performing a fire and life-safety inspection to ensure it meets the fire prevention code

Fire Officer's Role in Community Fire Safety

- Identify and correct fire safety hazards
- Develop and maintain preincident plans
- Promote fire safety through public education

Fire Officer's Role in Community Fire Safety

- In most areas, fire inspectors and fire officers perform fire inspections and have code enforcement duties.

Courtesy of Mike Legeros

Preincident Planning

- The preincident plan is described by NFPA 1620.
  - Document developed by gathering data used by personnel to determine the resources and actions necessary to mitigate anticipated emergencies at a specific facility

Fire Officer I

Preincident Planning

Tactical Priorities

Address: 1500, 1510, 1520		
Occupancy Name:		
Preplan #: 02-N-01	Number Drawings: 1	Revised Date: 12/2002
District: E275A	Subzone: 60208	By: ACEVEDO
Rescue Considerations: Yes ( ) No (X)		
Occupancy Load Day:	Occupancy Load Night:	
Building Size:	Best Access:	
Knox Box: NONE	Knox Switch: NONE	Opticom: NONE
Roof Type: X	Attic Space: Yes ( ) No ( )	Attic Height: X
Ventilation Horizontal:	Ventilation Vertical:	
Sprinklers: Yes (X) No ( )	Full (X) Partial ( )	
Standpipes: Yes (X) No ( )	Wet ( ) Dry ( )	
Gas: Yes ( ) No ( )	Lpg ( )	
Hazardous Materials: Yes (X) No ( ) DIESEL GENERATORS 1,000 GALLON TANKS BATTERY ROOM		
Firefighter Safety Considerations: ELEVATOR PIT		
Property Conservation And Special Considerations: VENTILATION: AUTOMATIC SMOKE REMOVAL SYSTEM 3 OFFICE BLDGS; 2 PARKING STRUCTURES 6 FLRS - 1230 W. WASHINGTON ST. 4 FLRS - 1500 N. PRIEST DR. 4 FLRS - PARKING GARAGE		

Preincident Planning

- Provides valuable information in the event of a fire at a high-value or high-risk location
  - High-value properties contain items with a high replacement value.
  - High-risk properties have the potential for catastrophic property or life loss.

Preincident Planning

- Identifies the strategies, tactics, and actions to take if a predictable situation occurs
  - Familiarizes fire fighters with the building
  - Useful for practicing initial operations

Systematic Approach to Preincident Planning

1. Identify site considerations.
2. Identify occupant considerations.
3. Identify fire protection systems.
4. Identify special hazards.
5. Identify operation considerations.
6. Identify special characteristics.

Step 1: Identify Physical Elements and Site Considerations

- A plot plan provides a representation of the exterior of the structure.
- A floor plan gives an interior view of the building.

Step 1: Identify Physical Elements and Site Considerations

- Preincident plan includes:
  - Building's size and dimensions
  - Connections between buildings
  - Access routes and points of entry
  - Concealed spaces and windows
  - Detailed information about construction
  - Any factor that might affect the ability of fire fighters to safely perform operations

Step 2: Identify Occupant Considerations

- If the plan determines that occupants should be removed, it must identify how.
- Plan should include:
  - Number of occupants and their ages
  - Occupants' physical or mental conditions
  - Need for assistance to leave the building
  - Building-specific information

Step 2: Identify Occupant Considerations

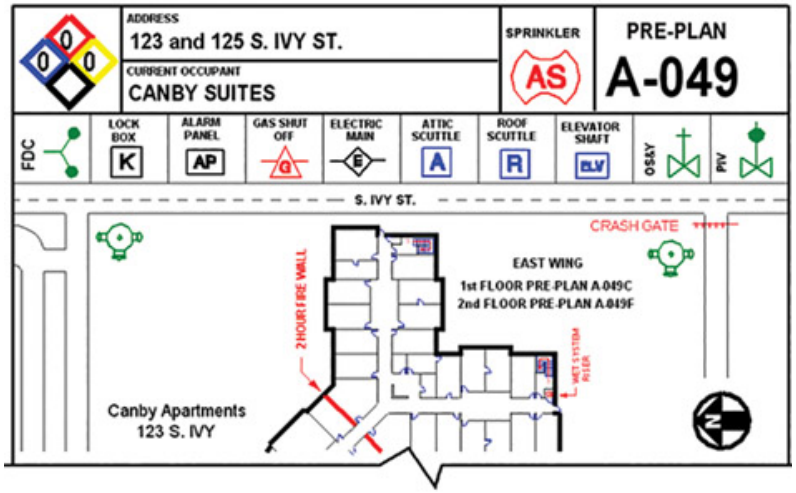
- Plan must reflect coordination between the facility staff and the fire fighters
  - A tracking system should be established.
  - Products of combustion must be segregated from the occupants.

Step 3: Identify Fire Protection Systems and Water Supply

- Determine water flow.
- Identify water supply.
- Give details for every fire department connection, fire pump, standpipe system, and sprinkler system.

Step 3: Identify Fire Protection Systems and Water Supply

- When demand exceeds the available water supply, the plan must address an appropriate response.



Courtesy of Palo Alto Fire Department.

Step 4: Identify Special Hazards

- Special hazards include:
  - Flammable or combustible liquids
  - Explosives
  - Toxic or biological agents
  - Radioactive materials
  - Reactive chemicals or materials

Step 4: Identify Special Hazards

- Some buildings contain specialized operations, processes, and hazards that can pose unique challenges.
  - Document emergency procedures.
  - Identify personnel who can provide technical assistance.

Step 5: Identify Emergency Operation Considerations

- Plan should be based on priorities of:
  - Life safety
  - Incident stabilization
  - Property conservation
- The number of fire companies required is affected by the fuel load.

Step 5: Identify Emergency Operation Considerations

- Plan should address all four stages of fire development:
  - Incipient
  - Free burning
  - Flashover
  - Smoldering/decay
- Anticipate areas of fire spread.

Step 6: Identify Characteristics of Common Occupancy

- Identify particular hazards for each occupancy group.
- Additional data may be required.

Putting the Data to Use

- Goal: develop a plan that is valuable to the owner and the fire department.
- The plan may be maintained in electronic or hard-copy form.

Understanding Fire Codes

- Fire officers perform inspections to enforce fire codes.
- Fire codes are often adopted or changed in reaction to a disaster.

Understanding Fire Codes

- The authority having jurisdiction is responsible for enforcing the requirements of a code or standard.
  - A fire code is usually enforced through code compliance inspections.

Building Code Versus Fire Code

- Building codes apply to construction, extension, or major renovation.
- Fire codes apply to existing buildings and situations involving potential fire risk or hazard.

State Fire Codes

- Most states have regulations that apply to all properties.
  - Most allow local authorities to adopt more restrictive codes, but some prevent this with “mini/max codes.”

State Fire Codes

- State fire marshal may work in:
  - Department of Insurance
  - Department of Public Safety
  - Regulatory agency
  - Cabinet-level office
  - State Fire Commission

Local Fire Codes

- Enacted by adopting an ordinance
  - A law enacted by an authorized subdivision of a state, such as a city, county, or town

Model Codes

- Developed by NFPA and other organizations
- Jurisdiction may adopt a model code in two ways:
  - Adoption by reference
  - Adoption by transcription

Retroactive Code Requirements

- Regulations that apply to a building remain in effect unless:
  - The building is remodeled
  - Occupancy use changes
- On occasion, the authority having jurisdiction passes a code revision that applies retroactively.

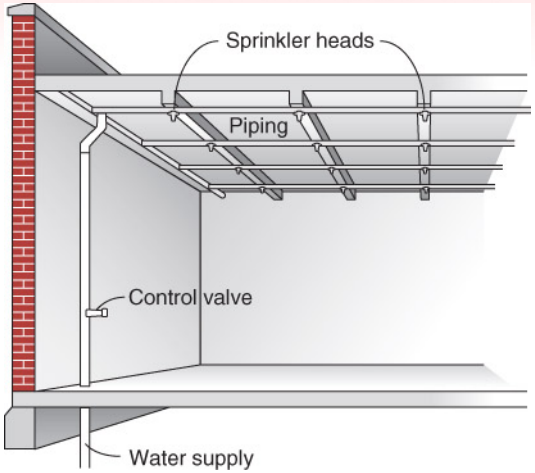
Understanding Built-in Fire Protection Systems

- Built-in systems are designed to assist fire fighters.
- Codes often allow more flexibility if built-in fire protection systems are included.
- Inspection is the best method of ensuring the systems will work.

Water-Based Fire Protection Systems

Fire Officer I

- Automatic sprinkler systems
  - Heat causes sprinklers to open and release water onto the fire.
  - When water starts flowing, an alarm is activated.



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Water-Based Fire Protection Systems

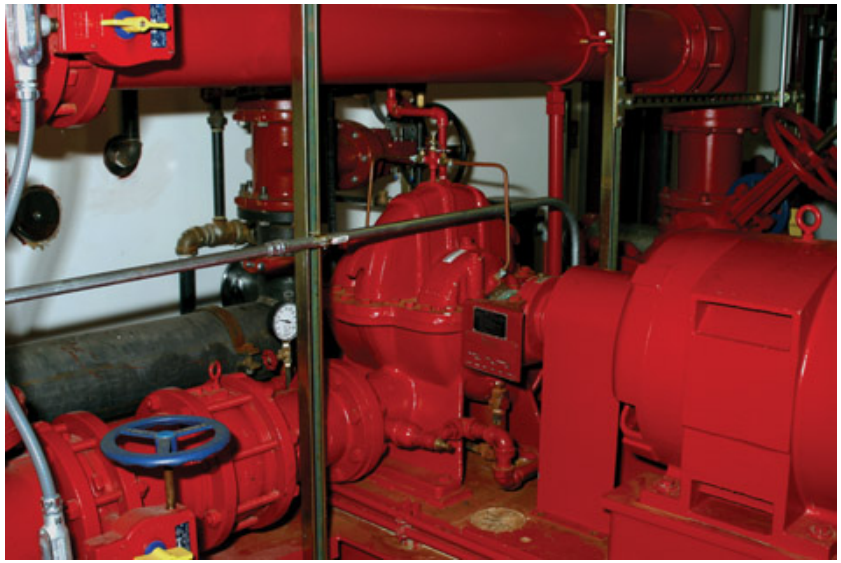
- Types of automatic sprinkler systems:
  - Wet pipe
  - Dry pipe
  - Deluge
  - Preaction

Water-Based Fire Protection Systems

- Standpipe systems
  - Enable connection of fire hoses
  - Subdivided into three classes:
    - Class I
    - Class II
    - Class III

Water-Based Fire Protection Systems

- Fire pumps
  - Increase water pressure in standpipe and automatic sprinkler systems



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Special Extinguishing Systems

- Carbon dioxide systems
  - Protect a specific device or process, or flood an enclosed space
  - The preincident plan should require use of self-contained breathing apparatus if such a system has been activated.

Special Extinguishing Systems

- Dry- or wet-chemical systems
  - Protect commercial cooking devices and industrial processes where flammable or combustible liquids are used

Special Extinguishing Systems

- Halon systems
  - Since 2000, Halon may not be manufactured or imported into the United States.
  - Legacy systems may still be recharged.

Special Extinguishing Systems

- Foam systems
  - Used with hazards involving flammable or combustible liquids
  - Create a smothering blanket that extinguishes fire and suppresses vapors

Fire Alarm and Detection Systems

- Monitor for fire and notify personnel
- Notify building occupants with audible and visual signals

Understanding Fire Code Compliance Inspections

- Objective of inspection: determine whether the property complies with the applicable codes
- The party responsible for code enforcement can be the fire chief or fire marshal.

Fire Company Inspections

- Identify hazards and ensure that violations have been corrected
- Regulations must be understood.
  - Determine the source of authority.
  - Do not enter private property without the permission of the owner or occupant.

Classifying by Building or Occupancy

- Codes may classify a building by:
  - Construction type
  - Occupancy type
  - Use group

Construction Type

- Type I
  - Noncombustible
  - Most durable type of structure
  - Allows time for extensive fire suppression without collapse
  - Often uses compartmentation

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Construction Type

- Type II
  - Noncombustible or limited combustible materials
  - Subdivisions based on fire resistance
  - Requires replacement in 30-40 years

Construction Type

- Type III
  - Exterior load-bearing walls are composed of noncombustible masonry.
  - Structural frame is protected in Type IIIA, but unprotected in Type IIIB.

© Ken Hammond/USDA

Construction Type

- Type IV
  - Exterior walls are noncombustible.
  - Interior elements are unprotected wood beams and columns.
  - A well-seated may exceed municipal water supply capacity.

Courtesy of APA – The Engineered Wood Association

Construction Type

- Type V
  - Entire structure may be constructed of wood or other approved material
  - Most common
  - Foundation for future innovative building methods

Occupancy and Use Group

- Occupancy type: purpose for which a building or portion of a building is used
- Code requirements are determined by use group.
- Each occupancy type has dozens of use groups.

Occupancy and Use Group

- Assembly
  - Used for the gathering of people for deliberation, worship, entertainment, eating, drinking, amusement, or awaiting transportation

Occupancy and Use Group

- Business
  - Used for account and record keeping or transaction of business other than mercantile

Occupancy and Use Group

- Educational
  - Used for educational purposes through the 12th grade
- Industrial
  - Where products are manufactured or similar processes are conducted

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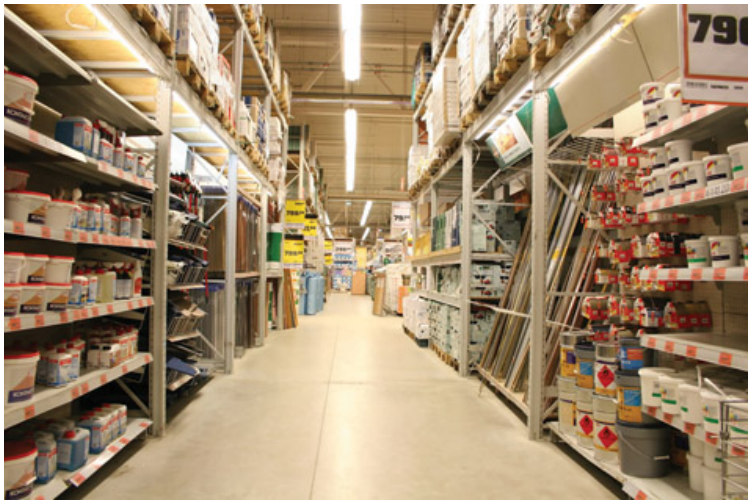
Occupancy and Use Group

- Health care
  - Used for medical purposes or other treatment or care of four or more persons
- Detention and correctional
  - Used to house four or more persons under varied degrees of restraint or security

Occupancy and Use Group

- Mercantile
  - Used for display and sale of merchandise



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Occupancy and Use Group

- Residential
  - Provides sleeping accommodations
  - Five subcategories:
    - One- and two-family dwelling units
    - Lodging and rooming houses
    - Hotels
    - Dormitories
    - Apartment buildings

Occupancy and Use Group

- Storage
  - Used primarily for the storage or sheltering of goods, merchandise, products, vehicles, or animals
- Mixed
  - Multiple types of occupancies within a single structure

Occupancy and Use Group

- Unusual
  - Some occupancies do not fit neatly into the other categories.

Table 13-1 Classification of Use Groups

Major Use Classification	Occupancy Categories
Assembly	Theaters, auditoriums, and churches Arenas and stadiums Convention centers and meeting halls Bars and restaurants
Health care	Hospitals and nursing homes
Detention and correctional	Prisons and penitentiaries
Mercantile	Retail stores
Business	Offices
Industrial	Factories
Storage	Warehouses Parking garages
Educational	Schools
Residential	Homes Apartments Dormitories Hotels

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NFPA 704 Marking System

- Colors represent a type of hazard.
  - Blue: health hazards
  - Red: flammability
  - Yellow: material reactivity hazard
- Numbers represent the relative hazard.
- Last quadrant indicates special hazards.

NFPA 704 Marking System

- Markers should be placed:
  - At each entrance to the building
  - On doorways to chemical storage areas
  - On fixed storage tanks

Preparing for an Inspection

- Review the fire code.
- Review prior inspection reports, fire history, and preincident plans.
- Coordinate with the fire prevention division.
- Arrange the visit.

Preparing for an Inspection

- Assemble tools and references:
  - Inspection form
  - Digital camera
  - Coveralls
  - Measuring device
  - Fire department business cards
  - Reference code books

Conducting the Inspection

- General overview
  - Circle the property and observe the building from all sides.
  - Park fire apparatus someplace where it will not disrupt the business.

Conducting the Inspection

- Meet with the representative.
  - Introduce your crew and explain the goal.
  - Ask to have a representative accompany the team.

Conducting the Inspection

- Inspect from outside in, bottom to top.
  - Walk around the exterior of the building.
  - Go to the basement.
  - Systemically walk through the building.
  - Look for conditions that are prone to starting fires.

Conducting the Inspection

- Exit interview
  - Meet with the owner or representative.
  - Review findings and issue any required correction orders.

Writing the Inspection/Correction Report

- Several types of inspection/correction reports are possible.
  - Must describe any needed corrections and cite the appropriate sections of the code

Writing the Inspection/Correction Report

- Review the finished report with the owner or the owner's representative.
- Life-threatening hazards must be corrected immediately.
  - Conduct follow-up inspections.

General Inspection Requirements

- Access and egress issues
  - Sufficient means of egress must be accessible to occupants.
- Exit signs and emergency lighting
  - Ensure exit lights are not burned out and that backup batteries work.

General Inspection Requirements

- Portable fire extinguishers
  - Verify extinguisher size, type, and location.
  - Inspect for physical damage.
  - Confirm instructions are visible, seal is present, inspection documentation is present, and pressure is normal.

General Inspection Requirements

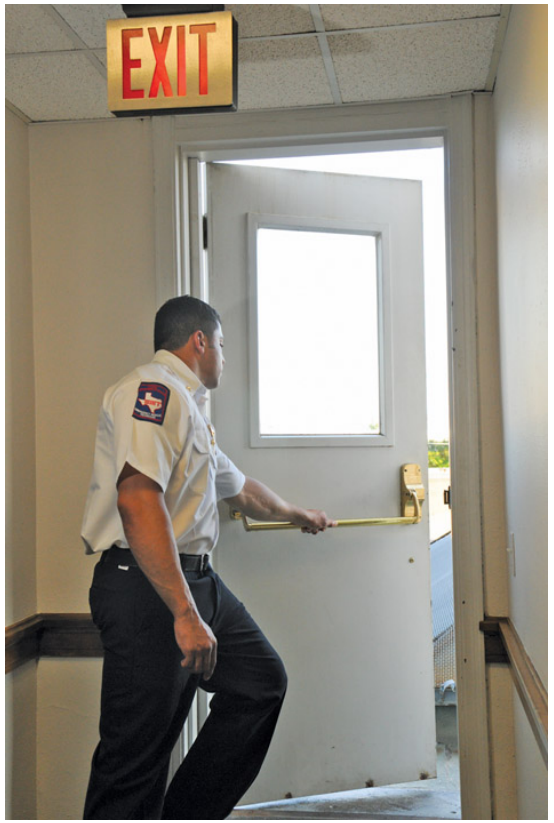
- Built-in fire protection systems
  - Inspect connection caps.
  - Inspect control valves.
- Electrical
  - Ensure panel covers are in place.
  - Check for hazards.

General Inspection Requirements

- Special hazards
  - May require a fire prevention division or hazardous use permit
- Hazard identification signs
  - Must meet NFPA 704 conditions
  - Material safety data sheets must be available.

Public Assembly Use Group Concerns

- Access and egress pathways
- Occupant load
- Exit lighting and emergency lights
- Curtains or other decorations
- Exhaust hoods and ducts



Business Use Group Concerns

- Access and egress pathways
- Use of electrical cords
- Storage of flammable liquids

Educational Use Group Concerns

- Exit paths
- Built-in fire protection systems
- Evacuation plan and emergency procedure training

Factory Industrial Use Group Concerns

- Many of the same hazards as business occupancies
- Specific fire hazards
- Improper storage of combustibles
- Fire protection systems and fire doors

Hazardous Use Group Concerns

- Fire prevention
- Markings
- Fire doors, smoke barriers, and fire protection systems

Health Care Use Group Concerns

- Occupant evacuation assistance
- Fire protection systems, automatic sprinklers, and smoke detection systems
- Fire evacuation plan

Mercantile Use Group Concerns

- Associated with many fire fighter line-of-duty deaths
- Properly marked and lit exits
- Housekeeping

Residential Use Group Concerns

- Inspection of common areas
- Exits, fire doors, and lighting
- Fire protection systems
- Housekeeping

Special Properties

- Includes structures that hold a wide variety of hazards
- Review applicable code requirements specific to occupancy type

Detention Use Group Concerns

- Working sprinkler system
- Accessible and marked standpipe connections and extinguishers

Storage Use Group Concerns

- Sprinkler and standpipe systems
- Hazardous materials
- Access and egress pathways

Mixed Use Group Concerns

- Must meet the most stringent requirement that applies to all the occupancies inside the building

Summary

- The fire officer looks at a building from two different perspectives:
  - Handling an emergency in the building
  - Performing a fire and life-safety inspection
- A preincident plan is used by personnel to determine the resources and actions necessary to mitigate emergencies.

Summary

- NFPA 1620 provides a six-step method of developing a preincident plan.
- Building codes apply to new buildings; fire codes apply to existing buildings.
- At the local level, fire and safety codes are enacted by adopting an ordinance.

Summary

- States and local jurisdictions may adopt a nationally recognized model code.
- The fire officer should understand how built-in fire protection systems work.
- The objective of a fire code compliance inspection is to determine whether a property is in compliance with the code.

Summary

- The purpose of a fire inspection is to identify hazards and violations.
- The codes classify a building by construction type, occupancy type, and use group.
- Conducting a fire inspection should be approached in a systematic manner.

Summary

- The inspection/correction report should describe any needed corrections.
- Use groups include public assembly, business, educational, factory industrial, hazardous, health care, mercantile, residential, special properties, detention, storage, and mixed.