

Fire Inspector Certification Program

New Jersey Uniform Fire Code Inspector training program

Module 11
Fire Protection System IFC Maintenance
Requirements



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Welcome

Instructor introduction

- Before we get started
 - Has everyone signed in?
 - Anyone have any questions?

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Fire Protection System Code Requirements

In this module we will Discuss the 2015 IFC
NJ-maintenance requirements for fire
protection systems including:

- *Fire sprinkler systems,*
- *Standpipe systems,*
- *Water supplies and testing,*
- *Fire pumps,*
- *Fire alarm systems*

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Fire Protection System Code Requirements

And the maintenance of...

- System monitoring,
- Commercial Kitchen Hood protection systems,
- Smoke Management Systems, and
- Fire extinguishers.

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Fire Code

NJ – UCC: *The UCC establishes the requirements for the installation and acceptance testing for all new fire protection systems.*

NJ- UFC. – *tells us how the systems are to be maintained.*

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901- General

- 901.1 Scope: *The provisions of this chapter apply to inspection, operation, testing, and maintenance for all fire protection systems.*
- 901.4 Installation: *The installation, expansion or replacement of any fire protection system requires a permit from the Construction Official*
- 901.4.1 Fire protection systems: *shall be maintained as originally required by installation standards at the time of construction.*

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901- General

- 901.4.1 Fire protection systems (Cont.)
 - *It is the owners responsibility to maintain all fire protection systems in operating condition at all times.*
 - *The owner must notify the Fire Code Official any time the fire protection systems are interrupted for Testing, repair, alteration, replacement*
 - *The Fire Code Official shall also be notified on the amount of time required to perform the necessary work.*

This section often cited for systems not in "Normal" operation

901- General

901.4.2 Fire protection system removal *Removal of systems that are no longer necessary due to removal of special hazard or no longer required under the UCC May be removed with the Approval of:*

Fire Subcode Official
Fire Code Official

All components of the system must be completely removed from the premises.

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901- General

901.4.3 Fire Area *This section requires that established fire areas are to be maintained as designed and installed under the UCC. Fire Barriers and horizontal assemblies must conform to the fire resistance ratings established by the UCC –building sub-code.*

Fire areas are established to reduce square footage below that which would require suppression

901- General

901.4.5 False Appearance *Any device that has the physical appearance of a life safety device and does not perform a life safety function is prohibited.*



901- General

901.4.6 Fire Pump Room *The fire pump room shall have adequate space installation in accordance with the manufactures requirements.*

Space shall also be provided for proper servicing, repair or replacement of equipment.

Passageway shall be sufficient to allow removal of large pieces of equipment

901- General

901.6 Inspection, Testing & Maintenance *Any installed fire alarm or fire suppression system, mechanical exhaust, and smoke and heat vents whether permanent or mobile shall be maintained in operable condition or repaired and replaced where defective.*



901- General

901.6.1 Standards *Fire Protection Systems shall be maintained, inspected and tested in accordance with the standards listed in Table 901.6.1.(next slide)*

This section is common violation citation for systems in trouble or out of service



901- General

Table 906.1.6.1

FIRE EXTINGUISHERS	NFPA 10-13
CARBON DIOXIDE SYSTEM	NFPA 12-13
HALON 1301 SYSTEMS	NFPA 12A-13
DRY CHEMICAL SYSTEMS	NFPA 17-13
WET CHEMICAL SYSTEMS	NFPA 17A-13
WATER BASED FIRE PROTECTION SYSTEMS	NFPA 25-14
FIRE ALARM SYSTEMS	NFPA 72-13
WATER MIST SYSTEMS	NFPA 750-15
CLEAN AGENT SYSTEMS	NFPA 2001-15
SMOKE CONTROL SYSTEMS	NFPA 92-15
SMOKE AND HEAT VENTS	NFPA 204-15
CARBON MONOXIDE WARNING SYSTEMS	NFPA 720-15

901- General

Table 906.1.6.1 Special Notes

NFPA-25 Appendix B forms must be used by testing agency.

NFPA –72 excludes acceptance testing form

NFPA –17&17A require the use of form in Appendix N of the 2015-IFC.

901- General

901.6.2 Records

*Records of test and maintenance or repair shall be maintained on premises for 3 years
Copies must be provided to Fire Code Official within five (5) business days of the inspection or test.*

901- General

901.6.3 Carbon Monoxide Alarms

■ *Carbon Monoxide alarms shall be maintained in accordance with NFPA 720 and the manufactures instructions*



901- General

901.7 Systems Out of Service

The fire department and Fire Code Official shall be notified immediately when a system is taken out of service.

- The Fire Code Official shall determine if an imminent hazard exists and if so shall take corrective measures as required in N.J.A.C. 5:70-2.16*
- Details provided in 901.7.1 through 901.7.6*

901- General

- **901.7 .1** the building owner shall assign an impairment coordinator
- **901.7 .2** tag shall identify the systems or portions that have been removed from service
- **901.7 .4** preplanned impairments shall be authorized by the impairment coordinator



901- General

Impairment Plan

- The extent and duration of the impairment
- Building area involved
- Safety recommendations
- Verification that the Fire Code Official and fire department are notified
- Verification that the alarm company & insurance carrier are notified
- Verification all supervisors in the areas affected have been notified
- A Tag impairment system has been implemented
- All necessary tools & materials are on site before the impairment is made.



901- General

- **901.7 .5 Emergency Impairments** emergency action shall be taken to minimize injury or damage in the impairment plan shall be put into operation.
- **901.7 .6 System Restoration:** when the impairment is restored to normal working order impairment coordinator shall verify all agencies listed in the plan are notified and all impairment tags have been removed.
- **901.8 removal or tampering with equipment;** it shall be unlawful for any person to interfere with the effectiveness removal or tampering with any fire protection system without the approval of the Fire Code Official

901- General

901.8.3 Removal of Hose

The Fire Code Official may permit the removal of hose from Class II or III standpipes if the following conditions exist:

- 1. Installation is not required by the UCC*
- 2. The hose would not be used by trained personnel*
- 3. The outlet remaining has the appropriate fire department thread.*

901- General

901.9 Termination of Monitoring Service

For fire alarm systems required to be monitored by this code, notice shall be made to the Fire Code Official whenever monitoring services are terminated. Notice shall be made in writing to the Fire Code Official by the monitoring service provider being terminated.

901- General

901.10 Recall Components

Equipment subject to voluntary or mandatory recall by federal law shall be replaced with approved listed components. The Fire Code Official shall be notified in writing by the building owner when recall component parts have been replaced

902-Definitions

All Definitions are now in Chapter 2

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902-Definitions

Key Definitions

- | | |
|--------------------------------|----------------------|
| ■ Alarm verification | ■ Fire Barrier |
| ■ Approved | ■ Fire Hazard |
| ■ Commercial cooking appliance | ■ Fire Wall |
| ■ Dwelling unit | ■ Floor Area Gross |
| ■ Employee work area | ■ Floor Area Net |
| ■ Exit | ■ Inhabited building |
| ■ Exit access | ■ Control Area |
| ■ Exit discharge | ■ Public Way |
| | ■ Unwanted Fire |

903 Automatic Sprinkler Systems

Automatic Sprinkler Systems
Key Sections for Inspectors

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903 Automatic Sprinkler Systems

■ **903.3 Installation requirements:**

- *Installed in accordance with the UCC and NFPA-13*



903 Automatic Sprinkler Systems

■ **903.3.3 Obstructed locations:**

- *Sprinklers shall not be delayed or obstructed.*
- *Shall be maintained as installed by the code in effect during construction*
- *Covered kiosks, displays or booths, concession stands, or equipment that exceeds 4 feet in width shall be protected.*
- *Minimum 3 foot clearance to piles of combustible fibers.*

903 Automatic Sprinkler Systems

- **903.3.6 Hose Threads:** *Compatible thread with fire department.*
- **903.3.8.4 Supervision:** *Control valves shall be indicating type and supervised as required by UCC*
- **903.3.8.5 Calculations:** *Hydraulic calculations shall be provided to verify capacity*
- **903.4.1 Monitoring:** *Alarm, trouble and supervisory signals shall be monitored*
- **903.4.2 Alarms:** *Exterior alarm required and must be connected to fire alarm system if present.*

Key Fire Inspection Points:

- Obtain copy of annual test report NFPA-25, etc.
- Visually inspect system for:
 - Valves open, labeled and supervised
 - Hydraulic calculation plate is on riser
 - Spare sprinklers and wrench are present
 - Sprinkler heads are unobstructed
 - Commodities match system design
 - Fire department connection is accessible
 - Hose threads are compatible with fire department hose.

904 Alternative Automatic Fire Extinguishing Systems



Section 904

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Types of Systems

- Wet chemical-NFPA 17A
- Dry chemical-NFPA 17
- Carbon dioxide-NFPA 12
- Halon NFPA 12A
- Clean agent NFPA 2001
- Foam NFPA 11 & 16



904.3 Installation

- *Type I hood (kitchens & mobile kitchens)*
- *System interlocks:*
 - *Automatic fuel valve , electric shunt trips*
- *Alarms and warnings:*
 - *Pre & post discharge, abort switch, tied to fire alarm system*
- *Monitoring: in accordance with NFPA-72*
- *Annual testing: as per standard requirements*
- *Manual pull stations*
- *Portable fire extinguishers*

904.5 Wet Chemical Systems

- *Installed to NFPA 17A*
- *Systems Tests: every 6 months*
 - *Detection systems*
 - *Alarm & release devices*
 - *Manual pull stations*
 - *Associated equipment*
 - *Stored pressure gauge*
 - *Stored pressure weight*
 - *Fixed temperature fusible links –changed annually*



904.6 Dry Chemical Systems

- *Installed to NFPA 17*
- *Systems inspected & tested every 6 months*
- *Testing includes:*
 - *Detection system, alarms & releases, manual pull stations, associated equipment*
- *Agent cylinder shall be checked for pressure & weight*
- *Fusible links shall be maintained to ensure proper operation.*

904.7 Foam Systems

- *Installed to NFPA 11 & NFPA 16*
- *Includes foam flooding systems, and foam sprinkler systems*
- *Tested in accordance with NFPA 25*
 - *Pre-post discharge alarms*
 - *Interlocks – fuel, electric shunts*
 - *Inductor and Foam storage tank*
 - *Automatic detection & manual pull station*
 - *Warning signs*

904.8 Carbon Dioxide Systems

- *Installed to NFPA 12*
- *Inspected and tested every 12 months*
- *Two types of systems:*
 - *Low pressure*
 - *Liquid levels checked weekly 10% loss requires refill*
 - *High pressure*
 - *Weight verified every –6 months from hydrostatic test date*
 - *10% loss requires cylinder replacement*

904.8 Carbon Dioxide Systems

- *904.8.4 Carbon Dioxide hand hoses:*
 - *Shall be examined every 12 months*
 - *Tested at 5 years at 2,500 psi for high pressure and 900 psi for low pressure*
- *904.8.5 Supplementary Equipment:*
 - *Valves, dampers, releases, alarms tested at 12 months*
- *904.8.6 Total Flooding Systems:*
 - *Warning signs, alarms, SCBA shall be maintained*

904.9 Halon Systems

- *Installed to NFPA 12A*
- *System shall be tested every 12 months*
- *Storage container shall be inspected every 6 months*
 - *5% loss of original pressure or 10% loss container shall be refilled or replaced*

904.9 Halon Systems

- *904.9.3 Hoses: Tested at 5 year intervals*
 - *Halon 1301*
 - *1,500 psi for systems 600 psi charging pressure*
 - *900 psi for systems 350 psi charging pressure*
 - *Halon 1211*
 - *2,500 psi for high pressure systems*
 - *900 psi for low pressure systems*
- *904.9.4 Auxiliary Equipment:*
 - *Doors, window releases, valves, alarms, pull stations – 12 months*
- *904.9.5 Total Flooding – alarms, warning signs, SCBA*

904.10 Clean Agent Systems

- *Installed to NFPA 2001*
- *904.10.1 to 904.10.3*
 - *Tested and inspected: every 12 months*
 - *Pressure loss in cylinder of 5% original pressure or 10% adjusted pressure requires replacement or refilling*
 - *Hoses: inspected at 12 month intervals*
 - *Replaced if damaged*
 - *Pressure tested at 5 year intervals*

Key Inspection Points

- The fire inspector should inspect the following:
 - Request annual test reports
 - Examine fire control panel for trouble or supervisory signals
 - Examine nozzle locations for obstructions
 - Examine storage system pressure gauges
 - Examine room for penetrations, holes, or openings that may effect gas concentration.
 - Examine warning signs and locations of manual pull and abort switches.
 - Examine ceiling tiles – (should be locked in)

904.12 Commercial Kitchen Systems

- *Must meet UL-300*
- *Manual pull between 10-20 ft of hood*
- *Fuel and electric shutoffs and shunts*
- *Portable fire extinguisher within 30 feet*
- *Solid fuel appliance 5 cu.ft. fire box-2A extinguisher*
- *K Class extinguishers*
 - *4 fryers = 1.5 gal Class K*



904.12 Commercial Kitchen Systems

- *New systems shall be listed for UL-300 application*
- *Must be listed for commercial kitchen use*



904.12 Commercial Kitchen Systems

■ **Manual Pull Station:**

- 10-20 feet from the kitchen exhaust system
- 48" to 42" inches off of floor
- Maximum pull force 40 pounds
- Maximum movement 14" inches



904.12 Commercial Kitchen Systems

- *All fuel and electric under the hood must shut down on systems actuation*



904.12 Commercial Kitchen Systems

- *904.12.3.1: Carbon Dioxide – ventilation shall shut down*
- *904.12.4: Automatic sprinklers – control valve at hood, sprinklers listed to UL 199E*
- *904.12.5: K class fire extinguisher within 30 feet of cooking appliances.*

904.12 Commercial Kitchen Systems

- 904.12.5.1 Solid Fuels: firebox 5 sq ft or less, K class rated fire extinguisher



904.12 Commercial Kitchen Systems

- 904.12.6 Operation & Maintenance:
 - Includes both fixed and mobile units
 - Changes of cooking media may requires fire suppression upgrade.
 - Fire suppression systems shall be serviced every 6 months
 - Fusible links & sprinkler heads must be replaced annually.
 - Exception : frangible bulbs

904.13 Domestic Cooking I-2 condition 1 use

- Domestic ranges installed under UCC
- Meets UL-300A
- Manual pull & interconnections required
- Portable fire extinguisher within 30 feet.



Key Inspection Points

- *The inspector should observe the following:*
 - *Inspection report on fire suppression system*
 - *Cleanliness of hood and filters*
 - *REQUEST CLEANING SCHEDULE*
 - *Check systems control head to insure it is armed*
 - *Inspect fusible links*
 - *Inspect nozzles for grease and proper caps*
 - *Inspect nozzle placement over each appliance*
 - *Insure all equipment is 6" in from the edge of the hood*
 - *Examine roof fan for grease accumulation*

NJ-IFC Section 905



Standpipe Systems

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905- Requirements

- *Compatible thread - with Fire Department*
- *Cabinets- shall not be locked unless frangible material, approved arrangement or I-3 use*
- *Accessibility- not obscured or blocked*
- *Identification-permanent sign 2" letters*
- *Tested - in accordance with NFPA-25*

Key Inspection Points

- *The fire inspector should examine the following:*
 - *marking of fire department connection*
 - *Thread compatibility with fire department*
 - *Marking of cabinets*
 - *Condition of hoses if present*
 - *Pressure reducing devices if present*
 - *Obstructions to cabinet access*
 - *NFPA- 25 test report documentation*

Section 906 Portable Fire Extinguishers



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Fire Extinguishers

- **Where Required:**
 1. New & existing A,B,E,F,H,I,M,R-1,R-2,R-4 & S
R-2 permitted 1-A:10BC
A,B,&E use: with quick response sprinklers only location 2-6
 2. 30 feet of commercial cooking
 3. Areas where flammable & combustible liquids are used
 4. On floors under construction (except R-3)
 5. Where required by Table 906.1
 6. Special hazards –labs,computer rooms, generator rooms.

Table 906.1

- *Table 906.1 lists additional requirements and locations of portable fire extinguishers and the appropriate IFC code sections.*
- *These are in addition to the requirements of NFPA 10 and distribution based upon tables 906.3(1) or table 906.3(2).*

Electronic Monitoring

- *30 day inspection is not required*
- *Maintenance shall be extended to 3 years for dry chemicals and halon extinguishers*
- *Electronics must monitor loss of power*
- *Non corrosive environment*
- *Monitoring circuits tested every 3 years*
- *Written log of hydrostatic test dates*



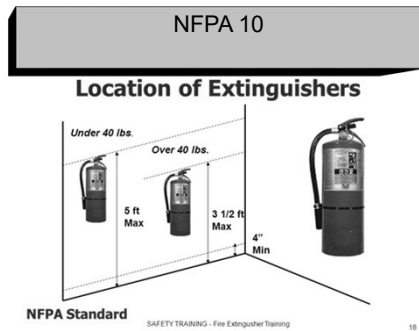
Table 906.3(1)

	LIGHT HAZARD	ORDINARY HAZARD	EXTRA HAZARD
MINIMUM RATED SINGLE FIRE EXTINGUISHER	2-A	2-A	4-A
MAXIMUM FLOOR AREA PER UNIT OF A	3,000 Square feet	1,500 Square feet	1,000 Square feet
MAXIMUM FLOOR AREA FOR EXTINGUISHER	11,250 Square feet	11,250 Square feet	11,250 Square feet
MAXIMUM DISTANCE OF TRAVEL TO EXTINGUISHER	75 feet	75 feet	75 feet

Table 906.3(2)

TYPE OF HAZARD	BASIC MINIMUM EXTINGUISHER RATING	MAXIMUM TRAVEL DISTANCE (FEET)
LIGHT(Low)	5-B	30
	10-B	50
Ordinary(Moderate)	10-B	30
	20-B	50
EXTRA(High)	40-B	30
	80-B	50

906.7 Hanger & Brackets



NJ-IFC Section 907



Fire Alarm & Detection Systems

Fire Alarms Systems

- 907.3.1: Duct detectors –visual/audible alarm –attended location
- 907.4.2.5: Fire Code Official approval for protective covers
- 907.6.5: Access shall be provided for inspection, maintenance, & testing
- 907.6.6: Monitoring as required by building code
- 907.6.6.1: Automatic dialers shall not be connected to fire department telephones without approval.
- 907.8: inspection and testing shall be in accordance with the 907.8.1-907.8.5 and NFPA-72

Fire Alarms

- 907.11.1 Single station smoke
 - Powered –test monthly
 - Battery –test weekly
- 907.11.2 R-1, R-2, bed breakfast, home stays
 - Test at change of occupancy
 - Replace battery every year or as needed
- 5:70-4.19 As of 1/1/19 battery operated smoke alarms must be replaced with 10 year sealed battery units.
 - Not applicable to UCC installed hard wired alarm systems



Section 908 Emergency Alarm Systems



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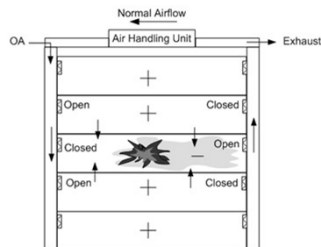
Section 908 Emergency Alarm Systems

■ 908.1-908.8:

- Use group H, H-5, HPM, toxic material storage, ozone gas generator rooms, repair garages (non odorized gases), refrigeration systems, CO₂ systems, high level alarm systems



Section 909 Smoke Control Systems



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Section 909 Smoke Control Systems

- 909.20: Maintained in accordance with the Manufactures instructions
 - Schedule inspected & operated every 6 months
 - Written test records, including who did it
- 909.20.4: Dedicated systems shall be operated semiannually and tested under standby power
- 909.20.5: Non-dedicated shall be annually and tested under standby power
- 909.20.6 By-pass weekly test must be tested semi annually on standby power

Section 911 Explosion Control



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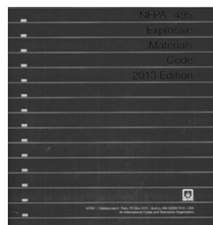
Section 911 Explosion Control

- 911.1 General: Maintained to NFPA 68 & 69 ,NFPA 495
- 911.2 Required deflagration venting: Relief pressure 100psi/sq ft.
 - Panels restrained
 - Relief to unoccupied space
- Table 911.1 lists facilities that require explosion control systems



Section 911 Explosion Control

- 911.3: Explosion prevention system:
 - NFPA 69
- 911.4 Barricades
 - NFPA 495



Section 912
Fire Department Connections



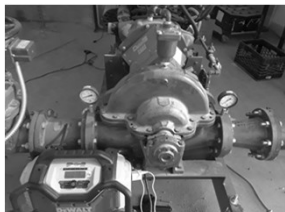
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Section 912
Fire Department Connections

- 912.2.2: Properly marked
- 912.3: Proper thread
- 912.4: Accessible and unobstructed
- 912.5: Signs for systems supplied
- 912.7: Maintained to NFPA 25



Section 913
Fire Pumps



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Section 913 Fire Pumps

- 913.1 General: maintained to NFPA 20
- 913.2: Uninterrupted power supply
- 913.4: All valves supervised
- 913.5: Tested to NFPA 25
- 913.5.2: Generator Sets
 - Tested to NFPA 110
 - Test transfer switch
- 913.5.4: Pump room must be heated, ventilated & illuminated



Section 915 Carbon Monoxide Detection

- All carbon monoxide alarms and detection systems shall be maintained in accordance within NFPA 720
- CO alarms that become inoperable shall be replaced



Section 916 Private Water tanks & Fire Service Mains



Tested to NFPA 25

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Section 917 Elevator Recall



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Section 917 Elevator Recall

- Tested annually
- Compliance to UCC
 - Elevator Subcode
- Alternate floor recall
- Operation of emergency keys
 - Phase –I
 - Phase –II
 - Firefighter instructions in car



Fire Protection System Code Requirements

*In this module we discussed what the codes
require are concerning the installation
and maintenance under the NJUCC of...*

- Fire sprinkler systems,
- Standpipe systems,
- Water supplies and testing,
- Fire pumps,
- Fire alarm systems

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Fire Protection System Code Requirements

And the installation and maintenance of...

- System monitoring,
- Hood protection systems,
- Smoke removal systems, and
- Fire extinguishers.
- Fire hydrants

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Next Lesson

Module 12

Hazardous Materials

Date/time

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Homework Assignments

For next module as stated in the syllabus

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End of Module

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