NY Fire Safety Institute

Presents the FDNY Certificate of Fitness
F-89
Fire & Life Safety Director

Component 1 Fire

Established 1995

Preparing the future High Rise Building Fire Safety Directors

NY Fire Safety Institute
The New Yorker, A Wyndham Hotel
481 Eighth Avenue. Suite 618
Eighth Avenue and West 34th Street

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Chapter 6. Other Fire Safety-Related Building Systems

6.1 Elevators and different modes of elevator operation

6.1.1 Special operating modes

There are different special operating modes for elevator emergency operations: Phase I emergency recall operation, Phase II emergency in-car operation, and manual (independent) mode.

(1) Common key-operated switch

Elevators with fire service systems are generally outfitted with a three-position, key-operated switch in both the lobby and elevator cars. The key configuration on the lobby panel and elevator car panel will vary, depending on the age of the elevator and the standards in effect when the fire service system was installed. The newer systems have "on," "off," and "bypass" key positions in the lobbies and "on," "off," and "hold" key positions in the cars. Older systems may be labeled "firefighter's service" or "normal" instead of "on" and "off."

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<tr>
<td>Typical three-position key switch in a lobby</td>
<td>Typical three-position key switch in an elevator car</td>
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The following introduction presents the common design of the key switch panels. The key configuration on the lobby panel and elevator car panel may vary, FLS Director must be familiar with his or her own building elevator operation procedures.

"On"/"firemen's service" position is both a lobby and car panel key position that places the system into fire service. Switching the key to the "on"/"firemen's service" position engages the fire service system.

Turning the lobby panel to "on"/"firemen's service" activates Phase I and recalls the elevators.

Turning the car panel to "on" activates Phase II, manual control of the car. The "on" position replaces the key position labeled "fireman's service" in older installations. (Note: the lobby switch must be in Phase 1 in order to put the car in Phase II)

"Off" is both a lobby panel and car panel key position. Turning the car panel switch to "off" will return the elevator car from Phase II to Phase I elevator operation and return the car to the lobby for use by later arriving units, provided that the lobby panel is keyed to the "on" position. Switching the lobby switch to "off" will disengage the elevators from fire service and return them back to normal functioning. "Off" replaces the key position labeled "normal" in older installations.

If the key is turned to "off" in the lobby, the car will not come out of Phase II unless the car panel switch is also turned to "off" and removed the car from Phase II.

"Hold" is a car panel key position used to keep the car on the floor you exited with the doors open. You can remove the firefighter's service key from the panel when it is in the "hold" position, and the car won't move from that position until you return with the key.

(2) Phase I emergency recall operation

Phase I emergency recall operation generally requires that elevator landings and elevator machine rooms be provided with smoke detectors that, when activated, will recall the elevator to a safe location (e.g. lobby) where the elevator doors will open. The doors may stay open or may close later depending on how the elevators are programmed. Such recall is also required for sprinkler waterflow alarms.

In the event a smoke detector fails or if emergency responders wish to use the elevator such as for the transportation of equipment in the treatment of a patient, a key switch is provided in the elevator lobby. The key switch can be activated by the use of the citywide standard key (2642 key) or fire department standard key (1620 key). Turning key to “On” or “Fireman’s service” will activate the Phase I recall operation and recall it to the lobby level where the elevator doors will open. The doors may stay open or may close later depending on how the elevators are programmed. A recall of an elevator bank will affect only the elevator cars serving that bank.

When the elevator is recalled, it proceeds to the recall floor (e.g. lobby) and stops with its doors open. The elevator will no longer respond to calls or move up and down. Located on the fire recall floor (e.g. lobby floor) is a fireman’s service (lobby key switch). In most cases, the fire recall floor can be identified by the key switch. The fireman’s service has the ability to turn fire service off and turn fire service on. The only way to return the elevator to normal service is to switch it to normal position after the alarms have been reset. However, if the key is turned to “off” on the lobby floor, the car will not come out of Phase II unless the car panel switch is also turned to “off” and removed the car from Phase II.

(3) Phase II emergency in-car operation

Phase II emergency in-car operation allows firefighters to control the elevator and travel to any floor served by the elevator. The operating controls are located inside of the elevator car. When the elevator is placed into the fire service mode, the elevator can only be operated by personnel in the elevator car.

Phase II operation is for emergency use only. Only trained personnel or first responders should use this feature.

Common actions in elevator car to perform the Phase II operation (every elevator may vary, FLS Director should be familiar with his or her own elevator design):

1. Insert the key in car and turn to “firemen’s service (on)” position.
2. Press the selected floor button and then press DOOR CLOSE.
   You may need to hold the DOOR CLOSE button until the door is fully closed (This feature will depend on how the elevators are programmed. The FLS Director must know how their elevators are programmed for Phase I and Phase II.).
3. Before reaching the selected floor, press CALL CANCEL (RESET).
   This CALL CANCEL (RESET) button is to change previously selected floor.
4. Press another floor button.
5. When the car reaches the new selected floor, press DOOR OPEN and hold until door is fully open.

   Once the elevator gets to the desired floor, it will not open its doors unless the first responder holds the door open button. This is in case the floor is burning and the first responder can feel the smoke or heat and knows not to open the door. The doors will close unless the door open button is pressed until it has fully opened

   After the door has fully opened, the first responder should turn the key to the “hold” position to make sure the elevator remains at that floor and no other person can operate the elevator; (the passenger panel

will be disabled); the elevator car will remain with door open on the floor until redirected by first responder.

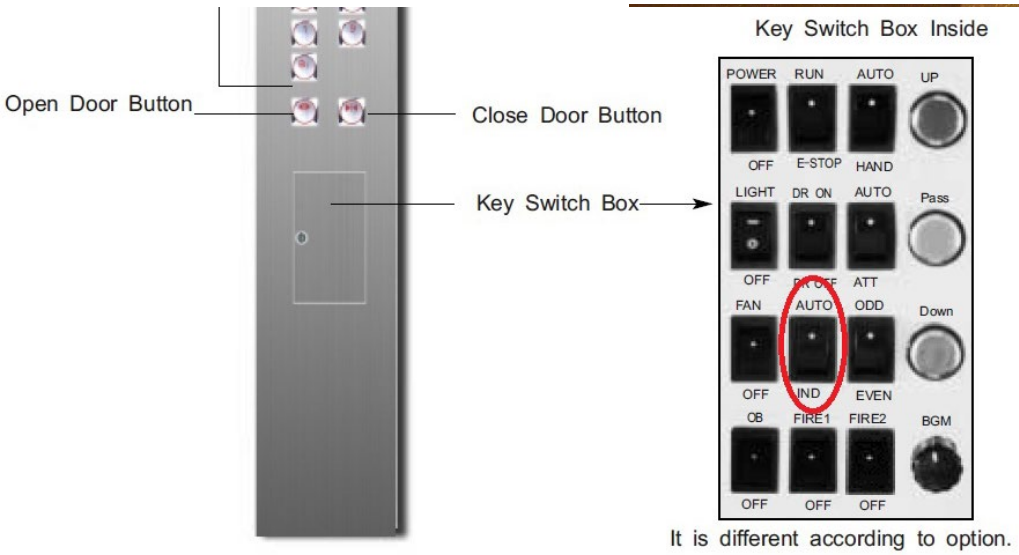
6. Turn the key to "fire service" position to continue Phase II operation.
7. Once Phase II operation is completed, the first responder will return the elevator to the lobby. When the elevator return to the lobby, press the DOOR OPEN button until the door is fully open. After the door has fully opened, turn the key to the "normal" position. The elevator will only be under Phase I operation.
8. Elevator will function normally once the Phase I has been removed.

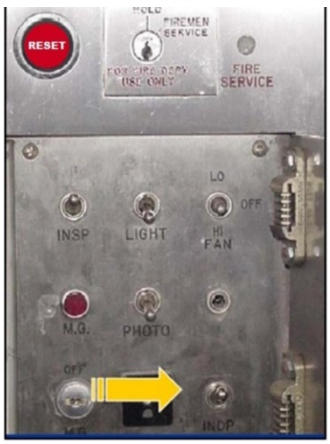
(4) Manual mode operation

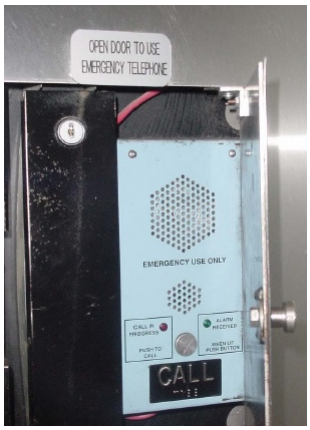
Manual (independent) mode is a special service mode found on most elevators. It is activated by a switch either inside the elevator itself or on a centralized control panel in the lobby. This special mode is usually used for non-fire emergencies or when transporting large freights or moving groups of people between certain floors. When an elevator is placed in manual (independent) mode, it will no longer respond to other calls. In a bank of elevators, the traffic is rerouted to the other elevators, while in a single elevator, the lobby buttons are disabled. The elevator will remain parked on a floor with its doors open until a floor is selected and the door close button is held until the elevator starts to travel. In some elevators, the operator needs to hold the button of the desired floor until the elevator starts moving.

An elevator in the manual (independent) mode must respond to Phase I recall.

Examples of independent switches:







(5) Required operation skills for FLS Directors

A Fire and Life Safety Director, must be fully capable of

(1) utilizing Phase I emergency elevator recall,
(2) utilizing Phase II emergency in-car operation including the following:
    a. closing the elevator door,
    b. canceling the floor selection, and
    c. opening the door utilizing the built-in safety feature.
(3) placing an elevator car designated in your Comprehensive Fire Safety and Emergency Action Plan in the manual (independent) mode (NOT PHASE II).

    Manually operate a designated elevator car in the manual (independent) mode including the following:

    a. closing the elevator door,
    b. moving the elevator to the designated floor,
(4) Communicating from the Fire Command Center
    a. acknowledging the call from the occupants in the elevator
    b. initiating communication with occupants inside the elevator.

6.1.2 Elevator in readiness

Building occupants safety and firefighting operations depend on these systems to function properly during emergency conditions. It is critical that the elevators be maintained in good working order at all times. Elevators in every building 75 feet or more in height must be kept ready for immediate use by the department during all hours of the night and day including holidays and weekends. There must be a competent building attendant available to operate such elevators, except that no attendant must be required for buildings between 75 and 150 feet in height having elevators with Phase I emergency recall operation and Phase II emergency in-car operation.

All elevators equipped with Phase I emergency recall operation and Phase II emergency in-car operation must be maintained in proper working order such that the emergency elevator operations are operable at all times. All elevators with Phase I emergency recall operation must be subjected, **at least monthly**, to a **Phase I recall test.** All elevators with Phase II emergency in-car operation must be subjected, at least **monthly**, to **a minimum of a one-floor operation II test**.

6.1.3 Keys and key access

Citywide standard key is a key of special or controlled design, also known as a "2642" key, approved by the FDNY which serves to operate elevator emergency recall and emergency in-service operation service switches and other devices or locks as required by the construction codes, including the Building Code, the Fire Code or the Fire Rules.

Fire department standard key is a key of special or controlled design, also known as a "1620" key, for the use of FDNY personnel and others specifically authorized by the FDNY, which serves to operate all switches, locks and other devices required to be operable by a citywide standard key.

Fire Code requires all keys for the elevator car doors and firefighter service key switches to be kept in an approved location (e.g. Fire Command CenterFire Command Center) for immediate use by the Fire Department.

It is unlawful to possess a fire department standard key, except for authorized department personnel and other approved persons. The fire department key serves to operate all switches, locks, and other devices required to be operable by a citywide standard key.

It is unlawful to possess a citywide standard key except for persons authorized to possess such key in connection with the following purposes:

1. Owners of buildings equipped with firefighter service elevators, or their authorized representatives, including FLS Directors and FEP coordinators.
2. Elevator contractors.
3. Elevator inspectors of the Department of Buildings.
4. Persons authorized to conduct testing and other maintenance or servicing of fire alarm systems.
5. Authorized department personnel.
6. New York City police officers and other approved law enforcement personnel.
7. Building owners required to have key boxes, locked boxes or locked gates or barriers pursuant to the Fire Code, or their authorized representatives.
8. Building owners with locked gates and barriers that block required fire department and fire apparatus access.
9. Locksmiths or other authorized key suppliers when in connection with their lawful business operations.

Citywide-standard keys must be able to operate the firefighter service elevator key switches and must be allowed to provide access to

(1) key boxes,
(2) gates and barriers, and
(3) other locked areas, boxes or cabinets

to which the department requires access for firefighting operations.

(1) Key boxes

The FDNY recommends that at least 6 citywide standard keys (2642) should be available for emergency or first responders' use.

A key box is a secure device with a lock operable only by a citywide standard key or other approved key. Where access to or within a building, structure or premises is restricted because of locked doors or other building openings, or where immediate access would be needed for lifesaving or firefighting purposes in the event of a fire or other emergency, the department may require that keys be kept in a key box installed in an approved location. The owner must ensure that the key kept in the lock box is replaced whenever a lock securing the area, box or cabinet is changed or rekeyed.

(2) Gate and barriers

Wherever a gate or similar barrier obstructs fire department access or fire apparatus access to a premises, and a lock is installed on such gate or barrier, the lock must be of an approved type and operable by a citywide standard key.

(3) First responder box

The fire department may require that a locked box operable by a citywide standard key be provided in a designated area in a building, structure or premises to store plans, building information cards or other materials (e.g. Fire Command CenterFire Command Center) that will assist firefighting personnel responding to a fire or other emergency at the premises.

6.2 **Maintenance of the means of egress**

6.2.1 Unobstructed and unimpeded egress

It is unlawful to obstruct or impede access to any required means of egress, including any exit, exit access, or exit discharge. All required means of egress, including each exit, exit access, and exit discharge, must be continuously maintained free from obstructions and impediments to immediate use in the event of fire or other emergency. All required means of egress must be maintained free from the accumulation of snow and ice.
It is unlawful to store combustible materials or combustible waste in corridors.
Door hardware and other devices and physical components of the means of egress must be maintained in good working order at all times. Security devices affecting means of egress must be subject to the approval of the Commissioner of Buildings in consultation with the commissioner.

6.2.2 Prevent overcrowding

Premises must not become overcrowded by the persons present on the premises that will obstruct or impede access to any means of egress. It is unlawful to cause overcrowding, maintain an indoor or outdoor space in an overcrowded condition, or allow an indoor or outdoor area or space to become overcrowded. The FDNY may order remedial actions necessary to abate the overcrowding condition and prevent future recurrence of such condition, including suspending or terminating the event or other gathering, vacating the premises, enforcing the lawful use and maximum occupancy of the premises, and/or requiring the provision of fire guards.

6.2.3 Furnishings and decorations

Furnishings, decorations, or other objects must not be placed so as to obstruct exits or exit access. Furnishings and decorations must not be placed in building hallway corridors or elevator lobbies (except as authorized by FC 1027.4 provided that the minimum required egress width is maintained). Hangings and draperies must not be placed over exit doors or otherwise be located to conceal or obstruct an exit. Mirrors must not be placed on exit doors. Mirrors must not be placed in or adjacent to any exit in such a manner as to confuse the direction of exit.

6.2.4 Stairway door operation and fail safe system

Buildings built in different years may have different stairway door operations and fail safe systems. FLS Directors must be familiar with the stairway door operation and the fail safe system in their building. The first responders will require the detail information regarding the operation and fail safe system of their building. Stairway is usually fireproof in a high-rise building and are used by the occupants to evacuate or to move between floors during an emergency. However, stairways do not always terminate at the lobby or at the roof. FLS Directors, must be familiar with the servicing areas/floors that each stairway can reach. FLS Director and FLS staff have to select the correct stairway for the building occupants to use for different fire or non-fire emergencies. The stairway doors may be locked from the stairway side and/or be provided with a "fail safe system."

The following table summarizes the different building codes requirements for different high-rise buildings.

Building code	Building height	Stairway door operation	Fail safe system
1968	≤100 ft	Doors may be locked to prevent access to the stairs at the street floor. Doors may be locked from the stairway side on each floor above the street floor.	NA
1968	≥100 ft	Doors may be locked to prevent access to the stairs at the street floor. The doors may be locked on the stair side above the street floor except that at intervals of **four stories** or less, doors must be openable or be equipped with fail-safe devices from the stair side.	It will be activated in the event of (1) the activation of any automatic fire detecting device, or (2) when any elevator in readiness is activated. The doors equipped with fail-safe devices will be unlocked, but the other doors without fail-safe devices are still locked.
2008 and 2014	≥75 ft	All door must be openable. However, door locked from the stair side may be permitted	It will be activated in the event of: (1) the activation of any automatic fire detection system, or

		provided that such door is equipped with an automatic fail safe system.	(2) when any elevator recall is activated, or (3) when any signal is received from the Fire Command Center.

A "fail safe system" is an electronically controlled device, which will allow a stairway door to be opened when the device is activated. This means that a door that is usually locked from the stair side will in time of emergency be unlock.

A "fail safe release device" will operate whenever the following occurs:

- An automatic fire –detecting device is activated
- Elevator is activated in Phase I
- A power failure occurs
- Manual operated from the Fire Command Center

If Fire Command Center is equipped with a manual release switch, FLS Director can release the fail safe system by activating the switch.
Based on the NFPA 72 (2010) requirement, the emergency control functions (e.g. door holder release, shutter release, door unlocking, etc.) must be tested by operating or simulating alarm signals. The fail safe system must be tested at least annually.

6.3 **Signs**

Several types of safety signs are required to be posted at different locations inside the building. The signs are made to protect the occupants. The signs mentioned below majorly are based on the Local Law 76 of 1968 (revised in 2003) unless specified otherwise. Buildings built pursuant to 2008 or 2014 Building Code must comply with the new signage requirements.

6.3.1 **Exits signs**

FLS Director, must make sure that all exits signs and emergency exit lighting are in proper working order.

The 1968 Building Code requirements:

(a) Hotels
The location of every exit on every floor and every opening from a room and containing cubicles must be clearly indicated by exit signs.
Such signs must be placed at an angle with the exit opening if such placement is required for the signs to serve their purpose. In long corridors, in open floor areas, and in all other situations where the location of the exit may not be readily visible or understood, directional signs may be required to serve as guides from all portions of the corridor or floor.
(b) High rise office buildings:

(1) All doors opening to corridors, to an exit, or to an exit passageway shall be marked with the word "exit.".

(2) Within exit stairs, horizontal extensions in exit stairs, horizontal exits, supplemental vertical exits and exit passageways, except within street level lobbies, there shall be directional markings.

(3) Illuminated exit signs complying with the 1968 Building Code must be placed in stairwells with horizontal extensions to indicate the transition from vertical to horizontal direction and at turns along the horizontal path. A supplementary sign, indicating the location of a recessed re-entry door, must be securely attached on the wall of the landing that faces the evacuee on the stairs.

(4) Signs must be readily visible from the egress direction.

(5) Other additional exit sign requirements must be complied with the 1968 Building Code.

(c) Assembly places

Exit signs must be provided in all assembly spaces to indicate the location of exits and, where necessary, the direction to the exits. All exit or directional signs must be placed so that they are clearly visible from all parts of the assembly spaces, and the bottom of all signs must be at least seven feet above floor level. Signs must be of the internally lighted type in all assembly spaces and be lighted at all times while occupied.

The 2008 Building Code requirements:

Exits and exit access doors must be marked by an approved exit sign readily visible from any direction of egress travel. Access to exits must be marked by readily visible exit signs in cases where the exit or the path of egress travel is not immediately visible to the occupants. Exit sign placement must be such that no point in an exit access corridor is more than 100 feet or the listed viewing distance for the sign, whichever is less, from the nearest visible exit sign.

In high-rise buildings, exit signs must be placed within exits at horizontal extensions to indicate the transition from vertical to horizontal direction and at turns along the horizontal path. All exit signs must be internally or externally illuminated except tactile exit signs. A tactile sign stating EXIT must be provided adjacent to each door to an egress stairway, an exit passageway and the exit discharge. The illuminated exit signs must be illuminated at all times and the letters of the signs must be red.

6.3.2 Non-exit door identification sign

Any door, passageway, stair, or other means of travel that is not an exit or that is not a way to an exit, but is so located as to be mistaken for an exit, must be identified with a sign reading "NOT AN EXIT," must be identified by a sign indicating its use or purpose, or must be provided with a directional exit sign.

6.3.3 Signs at elevator landings

These signs should be directly above the call button and its top must not be above 6 feet from the floor level.

a. Elevator landing sign

On all floors other than the main entrance floor, a sign must be posted and maintained on every floor at the elevator landing. The sign must read,

"IN CASE OF FIRE, USE STAIRS UNLESS OTHERWISE INSTRUCTED."

However, buildings built pursuant to the 2008 Building Code regulations must provide the following sign language for the elevator landing sign:

“IN FIRE EMERGENCY, DO NOT USE ELEVATOR. USE EXIT STAIRS”

b. Floor diagram signs

The sign must contain a floor diagram showing the location where it is posted and the location and letter identification of the stairs on the floor and each elevator bank.

Elevator landing sign

Elevator landing signs - separated

6.3.4 Floor number signs

Floor numbering signs must be posted and maintained within each stair enclosure on every floor. The floor numbering sign must be posted and maintained on the stair side of the door, or if no door, nearby on the wall or an adjacent conspicuous place.

6.3.5 Stair and elevator identification signs

Each staircase and each bank of elevators must be identified by an alphabetic letter. A sign indicating the letter of identification for the elevator bank must be posted and maintained at each elevator landing directly above or as part of the elevator landing sign

The staircase identification signs must be posted and maintained on both sides of the door, or if no door, nearby on the wall or an adjacent conspicuous place.

Staircase identification sign

Elevator bank identification sign

OR

Elevator bank identification sign combined with elevator landing sign

6.3.6 Stair re-entry signs.

Stair re-entry signs must be posted and maintained on the stair door at each floor in buildings, occupied or arranged to be occupied for an occupant load of more than a total of 500 persons in the entire building indicating re-entry is provided. The signs must be attached approximately five feet above the floor. The signs must read as follows:

(A) Where no re-entry is provided:

(i) Where no re-entry is provided from the stairs to any floor, the sign must read "NO RE-ENTRY FROM THIS STAIR" and such sign must be posted and maintained on the occupancy side of the stair door at each floor. No re-entry sign must be required on the stair side of the door.

(ii) On every floor where fail-safe re-entry locking devices are installed on exit doors, a sign reading "NO RE-ENTRY FROM THIS STAIR EXCEPT DURING FIRE OR EMERGENCY" must be posted on the occupancy side of the stair door.

(B) Where re-entry is provided to specified floors:

(i) On the stair side of the door at floors where re-entry is provided, the sign must read, "RE-ENTRY ON THIS FLOOR".

(ii) Where no re-entry is provided on that floor, the sign on the stair side of the door must read, "NO RE-ENTRY, NEAREST RE-ENTRY ON THE___ AND ___ FLOORS." The floor numbers of the nearest re-entry below and the nearest re-entry floor above must be entered in the blank spaces.

6.3.7 "No-smoking" sign

Durable "No Smoking" signs must be conspicuously posted at all entrances to facilities in which smoking has been entirely prohibited and any area therein where hazardous materials are stored, handled, or used. Facilities or areas within such facilities in which smoking is allowed in designated areas must have signs indicating that smoking is allowed in designated areas only.

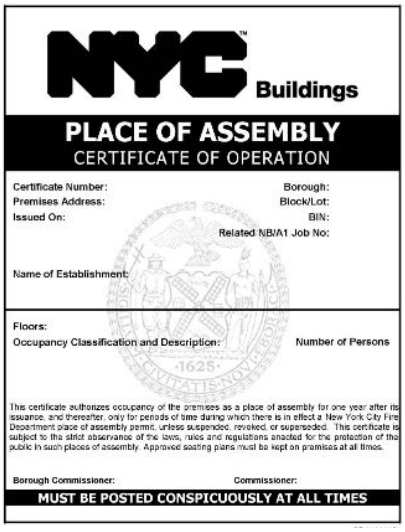
The signs must be provided in English as a primary language. A posted "No Smoking" sign must not be removed, obscured, or rendered illegible.

The Fire Department has published an approved "No Smoking" sign. It is set forth in Fire Department rule (as the following figure). However, the Fire Department does not mandate that this design be used. Other legible, durable signs, clearly communicating the "no smoking" requirement, may be used but are subject to Fire Department enforcement action if found to be inadequate.

6.3.8 Signs/ Documents for Place of Assembly Occupancies (Certificate of Operation, FDNY PA permit, and Maximum occupancy

A Place of Assembly (PA) Certificate of Operation is required for premises where 75 or more members of the public gather indoors or 200 or more gather outdoors, for religious, recreational, educational, political, or social purposes, or to consume food or drink.

The Department of Buildings performs the initial inspection for the first issuance of a Place of Assembly Certificate of Operation. It is unlawful to occupy any building or space as a place of assembly unless and utile a Certificate of Operation therefore has been issued by the Department of Buildings:
The Certificate of Operation issued after May 2013 does not expire. However, within one year after the issue date, FDNY will inspect the establishment and provide the premises with a Place of Assembly Permit based on the results of that inspection. All place of assembly occupancy will be subject to annual PA inspection and must obtain the annual FDNY PA permit. As with the PA Certificate of Operation, the PA Permit must be posted in a location that is visible to people entering the establishment.
A sign indicating the number of people that may legally occupy the space, as determined by the Certificate of Occupancy, must be also created and posted. It should read:


NYC Buildings

PLACE OF ASSEMBLY
CERTIFICATE OF OPERATION

Certificate Number:
Premises Address:
Issued On:
Borough:
Block/Lot:
BIN:
Related NB/A1 Job No:

Name of Establishment:

Floors:
Occupancy Classification and Description:
Number of Persons

This certificate authorizes occupancy of the premises as a place of assembly for one year after its issuance, and thereafter, only for periods of time during which there is in effect a New York City Fire Department place of assembly permit, unless suspended, revoked, or superseded. This certificate is subject to the strict observance of the laws, rules and regulations enacted for the protection of the public in such places of assembly. Approved seating plans must be kept on premises at all times.

Borough Commissioner:
Commissioner:

MUST BE POSTED CONSPICUOUSLY AT ALL TIMES

(Example of the new Place of Assembly Certificate of Operation.)

OCCUPANCY BY MORE THAN_____PERSONS
IS DANGEROUS AND UNLAWFUL
Public Assembly License No_____ Commissioner,

When a space is occupied for multiple purposes involving different occupant loads, the sign, issued by the Department of Building prior May 2013, must read as follows:

OCCUPANCY BY MORE THAN
(number)____PERSONS AS____(type of occupancy)____
OR BY
(number)____PERSONS AS____(type of occupancy)____
OR BY
(number)____PERSONS AS____(type of occupancy)____
IS DANGEROUS AND UNLAWFUL
Public Assembly License No_____ Commissioner,
(where applicable) Dept. of Buildings, City of New York

The capacity signs must be at least 12 inches wide and 16 inches high. The lettering must be red on a white background. The letters must be at least 1 inch high and the numerals at least 1¼ inches high. The signs must be framed under a transparent protective cover and permanently mounted in a location that is conspicuously visible to a person entering the space. The signs must be lighted by artificial illumination at all times during occupancy to maintain at least five foot candles on the surface of the sign.

6.3.9 Other signs/notice required in Hotels

(1) Guest room doors with floor diagrams

Signs with floor diagrams must be posted on or immediately adjacent to every required egress door from each guest room.

(2) Fire and emergency notice

A fire and emergency notice must be posted on or immediately adjacent to the main entrance door of guest rooms in Group R-1 (e.g. Hotels) occupancies and any emergency shelter. The notice must provide the following information and guidance as the commissioner may prescribe by Fire Rule:

1. A visual representation of the location to each exit stairway, the route thereto, and the number of doors opening onto the public corridor that must be passed to reach each such stairway.
2. Location of manual fire alarm boxes.
3. A written description and/or visual representation of the procedures to be followed in the event of a fire, smoke condition or other emergency.

(3) Guest room identification, directional markings and signs

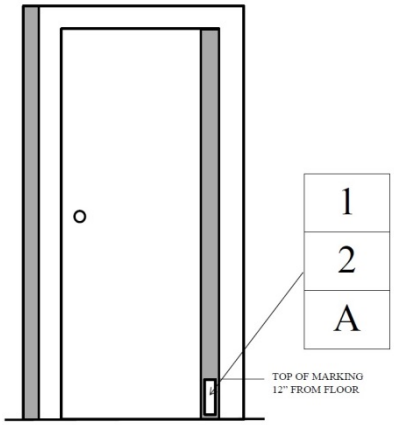
The Fire Department adopted a rule in 2016 to set forth standards and requirements for the design and placement of entrance door room number markings for dwelling units (apartments, guest rooms and sleeping rooms) in Group R-1 (Hotels) and Group R-2 buildings and occupancies, and building lobby and building hallway corridor directional signs, which serve to assist emergency response personnel in locating such dwelling units when

responding to fires, medical emergencies and other emergencies at the premises. The design and the location can be referred to the Fire Rule 505-01.

(4) Fire emergency markings

Dwelling units (apartments, guest rooms, and sleeping rooms) and stairway entrances in Group R-1 (Hotels) must be marked in accordance with the Fire Rule 505-02 to facilitate firefighting and emergency rescue operations at the premises.

The marking of entrance doors with emergency markings serves to better facilitate firefighting operations, thereby providing a greater level of safety to firefighters and building occupants. The fire emergency marking enables firefighters to identify apartment numbers in smoke conditions that obscure the regular (eye-level) door numbers. Such identification ensures firefighters can more quickly conduct search and rescue operations.



The sample figure depicts the location and vertical configuration of the fire emergency marking for a dwelling unit designated as 12A and having a single entrance. Other examples should be referred to the Rule 505-02.

Buildings and occupancies existing on May 31, 2016, must be brought into compliance with the new requirements by March 30, 2018, except that buildings and occupancies must be brought into compliance with multi-floor dwelling unit fire emergency markings by March 30, 2017. Buildings and occupancies with a certificate of occupancy or temporary certificate of occupancy dated on or after June 1, 2016, must be compliant with such requirements prior to occupancy of the building or occupancy.

6.4 HVAC systems, smoke control systems, and post-fire smoke purge system

6.4.1 Heating Ventilation and Air Conditioning (HVAC) systems

The heating, ventilation and air-conditioning functions are interrelated to provide thermal comfort and acceptable indoor air quality. The HVAC systems provide ventilation, reduce air infiltration and maintain pressure relationships between spaces.

HVAC systems include equipment used to:

- Ventilate
- Heat and cool
- Filter and clean
- Dry or humidify the air

A good HVAC management system can help to limit the spread of fire and to control the movement of smoke within the building. This system also provides assistance to the firefighters who are being deployed to control the fire, and who are conducting the search for any trapped occupants or fire.

To utilize the HVAC system to its full potential during a fire-related emergency in a high-rise building, the firefighters will need to gather information from the FLS Director and building engineer about how the HVAC system functions.

The HVAC systems found in high-rise buildings fall into two general categories:

(1) Central air conditioning system: The fan or fans serve multiple floors and the system supplies more than one floor.
(2) Package air conditioning system: Each package unit serves only the floor (or a zone) on which the unit is located.

Central air conditioning systems are more commonly found in high-rise buildings and can create more complicated problems during a fire. The central air conditioning system will be the main emphasis of this section.

The HVAC system may be divided into three sub-systems: processing equipment, supply of processed air to the floors of the building, and return of the air from the floors to be reprocessed. The processing of the air is usually done on the floors of the building where the mechanical equipment rooms are located. In a typical centrally air-conditioned high-rise building, the large volume of air required precludes the use of a single HVAC system. We will usually find a number of HVAC systems each supplying a group of floors. These groups are referred to as HVAC systems supply zones.

Building HVAC systems are typically controlled by a Building Management System (BMS), which allows for quick response to shut down or selectively control air conditioning systems. A Building Management System is a computer-based control system installed in buildings that controls and monitors the building's mechanical and electrical equipment such as ventilation, lighting, power systems, fire alarm systems, and security systems. In case a fire or smoke is detected by a smoke detector in the air duct, the programmed BMS will automatically initiate the shutoff of the HVAC systems. The duct smoke detector will also transmit an alarm signal to the fire alarm panel.

After the condition is verified by FDNY firefighting personnel, the HVAC system is allowed to be manually restarted from the BMS by the building engineer.

FLS Director, must consult with building engineers to be familiar with the fire protection and the interface with HVAC system. They must also obtain the following information concerning the HVAC system:

A. Location of the mechanical equipment room and the zones they supply.
B. Special HVAC zones in the building (theaters, restaurants, computer rooms, stores, etc.)
C. Central control of the HVAC systems and their location.

6.4.2 Smoke control systems

Smoke control systems are commonly found in the buildings relying on mechanical ventilation. Smoke (carbon monoxide and other products of combustion) is the greatest threat to life in the event of a building fire or explosion. While the fire may be localized, the smoke will travel wherever the building airflow will take it. Appropriate smoke control systems maintain smoke-free paths of egress for building occupants through a series of fans, ductwork, and fire smoke dampers.

Smoke control systems can be found in buildings such as hospitals, covered malls or other buildings containing atriums, high-rise buildings, and buildings with smoke protected seating.

There are two categories of smoke control systems: dedicated systems and non-dedicated systems.

Dedicated systems are those that don't perform any other functions. The fans and dampers are not used for everyday ventilation, only for controlling smoke during fire or fire-related emergencies. These are often found in stairways and elevator shafts to prevent the spread of smoke.

Non-dedicated systems provide HVAC in the building every day, but are captured by the smoke-control system in the event of a fire. There are numerous types of non-dedicated systems, based upon the HVAC design. However, the smoke control system should always capture the fans and dampers in the event of a fire, in order to control smoke.

(1) Smoke control systems maintenance

Fire Code requires that smoke control systems be maintained in good working order. It requires a written maintenance program, including periodic inspection and testing, to be established and implemented immediately upon installation of the smoke control system.

Dedicated smoke control systems must be tested semiannually. Nondedicated smoke control systems must be tested annually. **All systems must be tested under both normal power and emergency power.**

(2) Smoke control systems recordkeeping.

A logbook or other approved form of recordkeeping documenting each inspection and testing of smoke control system must include the date of the maintenance, identification of servicing personnel; description of any operating defects or deficiencies; notifications made; corrective action taken, including parts replaced; and/or other information prescribed by the Fire Department by rule. The 2014 Building Code requires that the **records be kept for at least the last 5 years of operation and must be made available for inspection by the Fire and the Building Departments.**

6.4.3 Smoke proof enclosure and stair pressurization

Both smoke proof enclosures and stair pressurization are smoke control systems, which are designed to produce pressure differences across smoke barriers that establish airflows to limit and direct smoke movement.

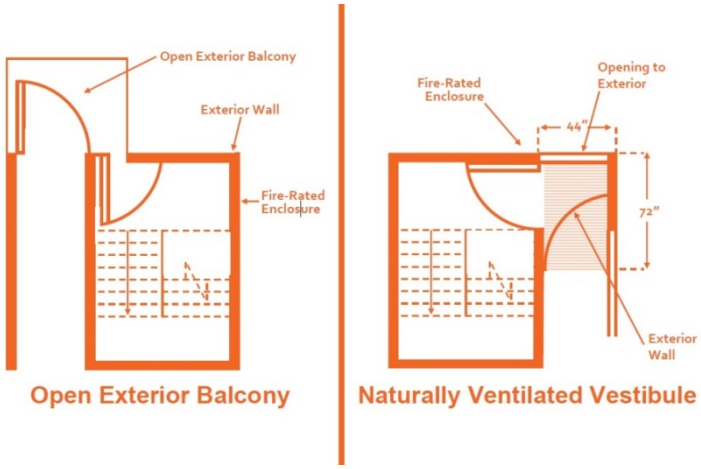
(1) Smoke proof enclosure

Smoke proof enclosure is an exit stairway designed and constructed so that the movement of the products of combustion produced by a fire occurring in any part of the building into the enclosure is limited.

Smoke proof enclosures must consist of one of the following systems:

1. An enclosed interior exit stairway accessed through an open exterior balcony (e.g. fire towers).
2. An enclosed interior exit stairway accessed through a naturally ventilated vestibule (e.g. fire towers).
3. An enclosed interior exit stairway accessed through a mechanically ventilated vestibule.
4. A pressurized interior exit stairway (e.g. stairway pressurization).

Doors in a smoke proof enclosure must be self-or automatic-closing by actuation of a smoke detector and must be installed at the floor-side entrance to the smoke proof enclosure. The actuation of the smoke detector on any door must activate the closing devices on all doors in the smoke proof enclosure at all levels. Smoke detectors must be installed.



(2) Stair pressurization

Pressurization is a creation and maintenance of pressure levels in building zones, including elevator shafts and stairways, that are higher than the pressure level at the smoke source, such pressure levels being produced by positive pressures of a supply of uncontaminated air; by exhausting air, and smoke at the smoke source or by a combination of these methods.

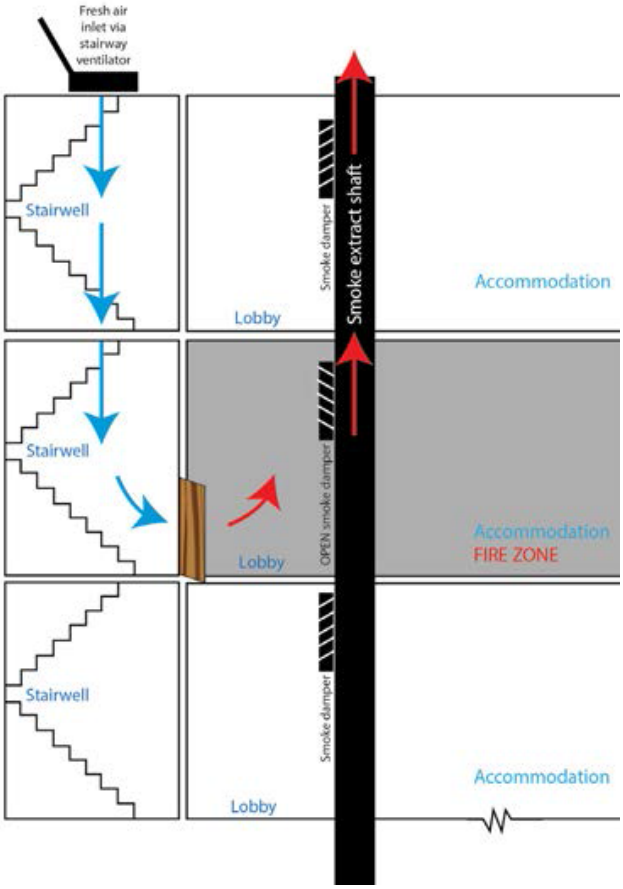
Stair pressurization is the process by which fans are activated within a stair enclosure to pressurize it and prevent smoke from entering that stairway. Upon activation of a fire alarm automatic initiating device, fresh air is introduced into the stairway to maintain a pressure difference between the stairs, and the floor area that the pressure in the stair is greater than the adjacent fire compartment. Then, if the stair door is opened, the system is intended to maintain a flow of air through the open doorway to oppose smoke spread and prevent contamination of the stair enclosure. It is very important that all other outlets/doors to the stairway remain closed to ensure the pressurization is adequate.

Improving other conditions within the stair can improve the speed of occupant egress via the stair, and thus limit the time of exposure to any potentially hazardous environment within the stair. For example, adequate stair lighting, photoluminescent stair/path lighting, and adequate door/stair widths may greatly increase the speed of occupant travel within the stair in a smoky environment, in combination with a stairway dilution system or other ventilation option.

6.4.4 Smoke shaft

'Smoke shaft' is the common term for ventilation systems in the floors of tall buildings, used to maintain tenable conditions in the common escape routes in the event of a fire in the building. Smoke shafts may be found in high-rise buildings pursuant to the 1968 Building Code**.** Buildings that are sprinklered throughout are exempt from the smoke shaft requirements.

Smoke shafts are essentially a simple ventilation system designed to extract any smoke leaking into a common floor to protect the escape stairs. Typically a vertical building's duct work rising through the building would be used to extract smoke from the floors, and each floor would have a damper connected to the building's duct work.



6.4.5 Smoke compartment

A space within a building enclosed by smoke barriers on all sides, including the top and bottom. The smoke compartment is required in any existing office building if the building:

- is over 100 feet in height;
- has air-conditioning and/or mechanical ventilation systems that serve more than the floor on which the equipment is located;
- is not fully sprinklered; and
- is more than 40 feet above curb level.

These buildings must be subdivided by fire separations into spaces or compartments of the size required by the Building Code. For example, all unsprinklered floor areas must be segregated by one-hour fire separations into spaces or compartments not to exceed 7,500 square feet. The other details can be referred to Building Code Title 27 Subchapter 5 Article 5 Section 27-339 (c).

Since Local Law 16/1984 required all new construction office buildings over 75 feet in height be fully sprinklered, compartmentation requirements will only be applicable to the high-rise office buildings built prior to 1984 and not being fully sprinklered.

6.4.6 Post-fire smoke purge system

As more and more buildings are sealed tightly with unopenable windows to conserve energy, there are problems after the fire in venting the building of the smoke and gases. In order to expedite that process and allow the building to be reentered more quickly, all highrise office and hotel buildings will be required to have a manual smoke purge system. Post-fire smoke purge system is a mechanical or natural ventilation system intended to move smoke from the smoke zone to the exterior of the building. Such systems are intended for the timely restoration of operations and overhaul activities once a fire is extinguished. Post-fire smoke purge systems are not intended or designed to be life safety systems. This system is required in all high-rise buildings and other buildings listed in Section BC 912

For the post-fire smoke purge system pursuant to 2008 or 2014 Building Code, a firefighter's smoke control panel for Fire Department emergency response purposes must be provided. The panel must include manual control or override of automatic control for mechanical smoke control systems. The panel must be located in a Fire Command Center complying in high-rise buildings or buildings with smoke-protected assembly seating. The panel must be able to manually activate the post-fire smoke purge system. The post-fire smoke purge system will be under the control of the FDNY only and will enable the FDNY to exhaust the toxic gases from the building.

Post-fire smoke purge systems must be maintained in good working order. A record of inspections and tests must be maintained on the premises or other approved location for a minimum of 3 years.

6.5 **Emergency power system and Battery systems**

6.5.1 Emergency power systems

Emergency power systems are intended to provide electrical power for life safety systems where the loss of normal power would endanger occupants. Emergency power systems are required to be provided in all hotels, high-rise office buildings, some assembly occupancies, or office buildings under 75 feet in height that have more than 15,000 sqft per floor or a total gross area over 100,000 sq. ft.

NFPA standard 110 recognizes two levels of emergency power systems:

- Level 1 systems shall be installed where failure of the equipment could result in loss of human life or serious injury. Essential electrical systems can provide power for the following essential functions:
    - Life safety illumination
    - Fire detection and alarm systems
    - Elevators
    - Fire pumps
    - Public safety communications systems
    - Industrial processes where current interruption would produce serious life safety or health hazards
    - Essential ventilating and smoke removal systems

- Level 2 systems shall be installed where failure of the equipment is less critical to human life and safety. Level 2 systems typically are installed to serve loads, such as the following, that, when stopped due to any interruption of the primary electrical supply, could create hazards or hamper rescue or fire-fighting operations:
    - Heating and refrigeration systems
    - Communications systems
    - Ventilation and smoke removal systems
    - Sewage disposal
    - Lighting
    - Industrial processes

(1) Individuals authorized to perform tasks

Fire Code requires that the inspection, testing and other maintenance of emergency power systems be conducted under the supervision of a person having one of the following qualifications:

- A person holding a Certificate of Fitness as a Fire and Life Safety Director.
- A person holding a Q-01 Certificate of Qualification.
- An electrician licensed by the Department of Buildings.
- An electrician holding a special license issued by the Department of Buildings.
- A person holding a stationary engineer license, or high-pressure boiler operating engineer's license issued by the Department of Buildings.
- A registered design professional.

FLS Director must at least know what type of emergency power systems are installed at his or her premises, the locations of the power source and the location of the control switch for activating the emergency generator. They also must know what equipment is connected/served by these emergency power systems.

(2) Periodic inspection and testing requirements

Fire Code requires that emergency power systems be maintained in accordance with NFPA Standard 110, as modified by FC Appendix B (Emergency and Standby Power Systems) and NFPA Standard 111 (Stored Electrical Energy Emergency and Standby Power Systems). Chapter 8 of NFPA Standard 110 includes requirements for the periodic inspection, testing and other maintenance of emergency power systems supplied by emergency generators. Chapter 6 of NFPA Standard 111 includes requirements of the periodic inspection, testing, and other maintenance of stored emergency power systems. These NFPA standards should be reviewed in their entirety to fully understand the requirements.

Fire Code requires that the inspection, testing and other maintenance of emergency power systems be conducted in accordance with an established schedule. **The following table summarizes the NFPA standards. The information boxed on the following pages may be provided as part of the reference material during the school graduation exam or the FDNY exam**.

FLS Director, must ensure the frequency and the procedures to inspect, test and/or maintain the emergency power system comply with all the requirements.

NFPA Standard 110

Chapter 8 of NFPA Standard 110 includes requirements for the periodic inspection, testing and other maintenance of emergency power systems supplied by emergency generators. Emergency power systems subject to compliance with the requirements of NFPA Standard 110, as modified by FC Appendix B must be maintained as follows:

- Storage batteries, including electrolyte levels or battery voltage, must be inspected weekly and maintained in full compliance with the manufacturer's specifications. Lead- acid batteries must include the monthly testing and recording of electrolyte specific gravity.
- Emergency power systems, including all related components, must be inspected weekly and exercised under load monthly.
- Emergency generator sets must be tested monthly for a minimum of 30 minutes under operating temperature conditions and at not less than 30 percent of the emergency power system nameplate kilowatt rating, or under loading that maintains the minimum exhaust gas temperatures as recommended by the manufacturer. Instructions must be provided for safe manual transfer in the event automatic transfer switches malfunction.
- Diesel-powered emergency power system installations that do not meet the requirements of generator set monthly exercise as noted above must be tested monthly with the available emergency power system load and exercised annually with supplemental loads at 25 percent of nameplate rating for 30 minutes, followed by 50 percent of nameplate rating for 30 minutes, followed by 75 percent of nameplate rating for 60 minutes, for a total of 2 continuous hours.
- Transfer switches must be tested semiannually. The semiannual test of a transfer switch must consist of electrically operating the transfer switch from the standard position to the alternate position and then returning back to the standard position.
- Level 1 emergency power systems must be tested every 3 years for at least 4 hours under their running load. A full facility power outage is not intended for this test, but is recommended where a facility power outage has not occurred within the last 36 months.
- Emergency power systems must be maintained to ensure to a reasonable degree that the system is capable of supplying service within the time specified for both the type and the class. The maintenance procedure and frequency should conform to the manufacturer's recommendations. In the absence of such recommendations, Figure A.8.3.1(a) of NFPA Standard 110 suggests periodic (weekly, monthly, quarterly, semiannually and annually) visual inspection, checking, changing components, cleaning and testing of the following:
  - Fuel.
  - Lubrication system.
  - Cooling system.
  - Exhaust system.
  - Battery system.
  - Electrical system.
  - Prime mover.
  - Generator.
  - General conditions of emergency power systems (any unusual condition of vibration, leakage, noise, temperature or deterioration), and service room or housing housekeeping.

- Restore systems to automatic operation condition.

NFPA Standard 111

Stored electrical energy emergency power systems subject to compliance with the requirements of NFPA Standard 111 must be maintained as follows:

- Equipment must be inspected monthly and tested quarterly under connected load for a minimum of 5 minutes. The monthly inspection must include the following:
  - Battery and associated charger/control equipment must be checked to verify that they are in a clean and satisfactory condition.
  - Battery electrolyte levels, individual cell voltages and specific gravity must be checked.
  - Conditions of the plates and sediment of free-electrolyte, lead-acid batteries in transparent containers must be checked.
  - A load test must be performed and the output voltage, the battery voltage, and the duration of the test must be recorded at the beginning and end of the test for each battery set.
  - All indicator lamps, meters, and controls must be checked to verify that they are operating correctly.
- Stored emergency power systems must be checked annually at full load for time duration as specified in NFPA Standard 111.
- Transfer switches must be tested semiannually.
- A regular maintenance and testing program must be established. The maintenance procedure and frequency should conform to the manufacturer's recommendations. In the absence of such recommendations, Table A.8.3.2 of NFPA Standard 111 suggests periodic (weekly, monthly, quarterly, semiannually, and annually) visual inspection, checking, changing components, cleaning and testing of the following:
  - Battery.
  - Energy conversion equipment.
  - Battery charger.
  - Load current (check quarterly).
  - Transfer switch (tested semiannually).

(3) ***Recordkeeping***

A written record of inspection, testing and other maintenance of emergency power systems, including additional description of any conditions requiring correction, and what corrective action was taken, is required to be maintained on the premises. Records are required to be maintained for at least 3 years.

6.5.2 Battery systems

Battery systems can provide an uninterruptible power supply (UPS) that is capable of providing electrical power to key operating systems in a building. The primary purpose of a UPS system is to provide current to a load for a short period of time to certain building systems in the event of normal power failure. When a building with a "UPS" system suddenly loses power from the utility company the UPS system becomes the sole power provider for all designated connections. The difference is that a UPS battery system switches on instantaneously so that there is no down-time or absence of power. A building with a UPS system, but no emergency generator, will lack power if the UPS system has fully discharged.

Individuals authorized to perform tasks

Certain battery systems in place today, regardless of installation date, must be under the general supervision of a person holding a B-29 Certificate of Fitness from the FDNY. This applies to all stationary storage battery systems (i.e. facility standby power, emergency power, or uninterrupted power supplies) having an electrolyte capacity of at least:

50 gallons for

- flooded lead acid
- nickel cadmium (Ni-Cd)
- valve-regulated lead acid (VRLA)

1,000 pounds for

- lithium-ion
- lithium metal polymer

In order to ensure that a battery system is properly working, a B-29 Certificate of Fitness holder is primarily responsible for visual inspection. The B-29 Certificate of Fitness does NOT authorize the C of F holder to perform any repairs on the battery system.

Stationary battery system rooms and enclosures must be designed and constructed in accordance with the Building Code. Battery systems may be installed in the same room as the equipment to which they provide power.

Signage requirements

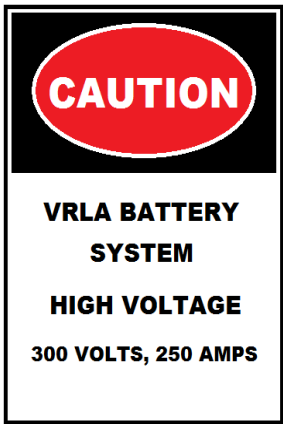
Signs and instructions should be posted near battery room for personnel, in case of emergency with no trained or designated FLS Director on site. The signage that may be used in battery areas include but are NOT limited to the following:

Any potential hazards, safety precautions or instructions, shutoff switch locations, or other important information is recommended to be posted conspicuously.

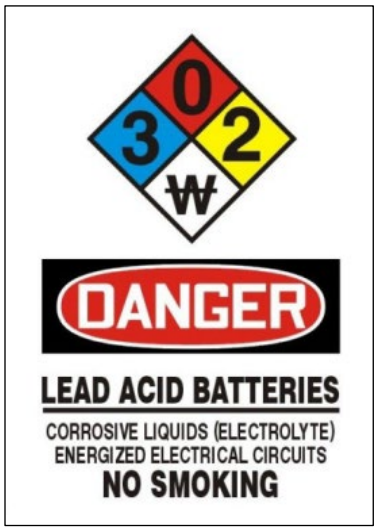
A durable sign that reads as follows must be posted on doors into electrical equipment rooms or buildings containing stationary battery systems: “CAUTION: This room contains energized battery systems. Battery electrolyte solutions may be corrosive.”

Cabinets must have a sign or marking identifying the type of battery system, the electrical rating (voltage and current) of the system, and applicable chemical and fire hazards.

Examples of cabinet signs would be the following:



NFPA 704 diamond signs are required to be posted in battery areas with a minimum of 55 gallons of corrosive material. The sulfuric acid specific sign is shown below:



Emergency procedures

Emergency procedures detailing how to shut down the power from the battery system must be posted on or near the battery system or kept in an approved location on the premises. The procedures must also include a 24-hour/7-day per week telephone number by which the owner can be contacted to provide additional information to emergency responders.

Multi-tenant buildings

Many buildings in NYC are not occupied by a single tenant and therefore may have more than a single UPS system within the building. Each tenant is responsible for his/her own system, or systems. Typically, one tenant will have a different C of F holder than the next tenant so that tenants and entities can remain independent of one another. This does **not** mean that they cannot share a C of F holder. The building manager is responsible to know the location of all UPS battery systems in their building and know who is responsible for each UPS battery system.

For example, assume one building has 10 tenants occupying at least 10 floors. All of the situations below would be acceptable:

All 10 tenants in the building use the same C of F holder to inspect their systems. *(Very unlikely)*

Eight of the 10 tenants use the same C of F holder for inspections, and the other two each have their own C of F holders.

All 10 tenants in the building have separate C of F holders – meaning 10 different C of F holders are in the building on a daily basis. *(Preferred)*

Single tenant buildings

If there is only one tenant in a building, then typically there will only be one C of F holder for all of the UPS systems occupying the building, whether it is one or 20. Again, this is not required. If the tenant desires 20 different inspectors for the 20 systems, then that is acceptable. The building FLS Director and the building owner should have access to a list of all the battery system C of F holders, their respective contact information, and the exact location of the battery systems that they provided with general supervision.

Periodic inspection and testing requirements

All such visual inspections should be conducted by a B-29 Certificate of Fitness holder to provide general supervision. The B-29 Certificate of Fitness holder should walk through and do a "quick" visual inspection at least once per day.

6.6 **Refrigerating systems**

6.6.1 Introduction

A refrigerating system is a combination of interconnected refrigerant-containing parts constituting one closed refrigerant circuit in which a refrigerant is circulated for the purpose of extracting heat. Refrigerating systems are most commonly used in buildings for purposes of human comfort. As such, the operation of refrigerating systems is integral with building ventilation systems which have a direct impact on the movement of smoke throughout a building under fire conditions.

6.6.2 Permits

Fire Code requires a permit to maintain or operate a refrigerating system that uses a Group A1, A2, A3, B1, B2, or B3 refrigerant or that is mounted on or suspended from a roof or ceiling. No permit is required for a refrigerating system of less than five horsepower that uses a Group A1 refrigerant and that is not mounted on or suspended from a roof or ceiling. No permit is required for a refrigerating system installed in the residence portion of any building or employing water or air as a refrigerant.

Additional Equipment Use Permit, other approved documentation, issued by the Department of Buildings for systems mounted on or suspended from a roof or a ceiling may be required. To verify if your system requires an Equipment Use Permit, contact the Department of Buildings via 311 or through the Department of Buildings website.

6.6.3 Supervision

The Fire Code requires that certain refrigerating systems (FC Table 606.1.1) be under the personal supervision of a person holding a Certificate of Qualification as a Refrigerating System Operating Engineer (RSOE). You should refer to FC Table 606.1.1 for detailed requirements.

For those systems requiring personal supervision, at least one RSOE must be present in the building while the system is in operation. "Present in the building" is a critical requirement. On the flip side, if the refrigerating system is shut down, no RSOE is required to be in the building.

6.6.4 Periodic inspection, testing, and maintenance requirements

Operator inspection after repairs

After any repairs are made to a refrigerating system, the operation of which requires supervision by a certificate of qualification holder, the certificate of qualification holder must check the repairs together with the functioning of all control devices and the positioning of all valves.

6.6.5 Recordkeeping

Operator logbook

Fire Code requires a logbook for refrigerating systems whose operation requires supervision by a Q-01 certificate of qualification holder. Entries are required to be made in the logbook by the Q-01 certificate of qualification holder. The logbook must include entries of any operating problems or deficiencies, and required periodic tests conducted.

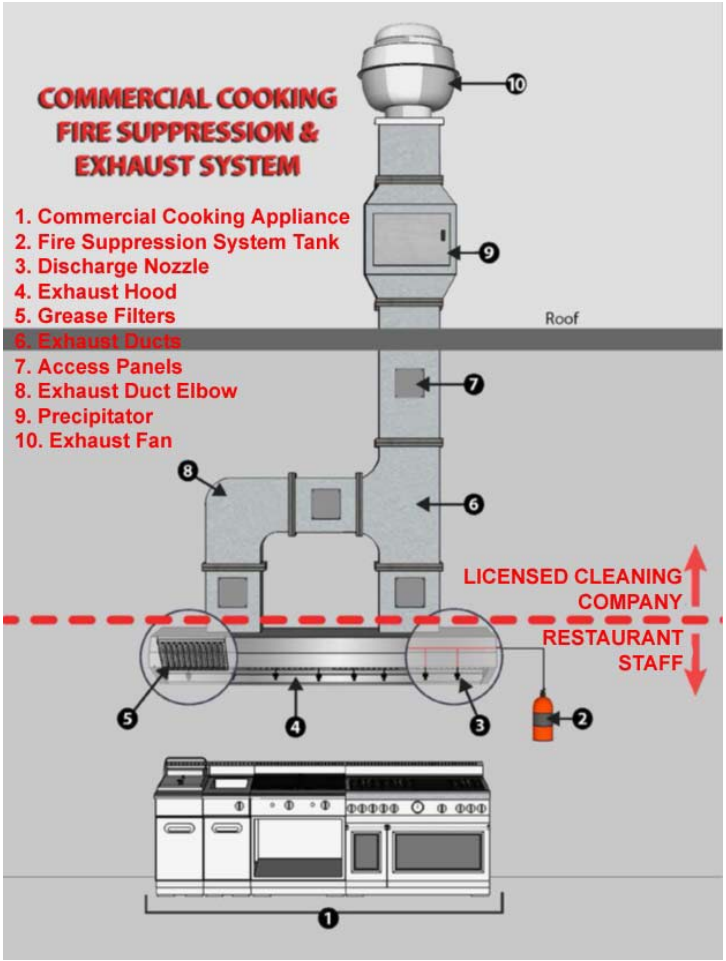
Written records

Fire Code requires a written record to be kept of refrigerant quantities brought into and removed from the premises. Records of all refrigerating system periodic inspection, testing, and other maintenance required by the Fire Code are required to be maintained on the premises for a minimum of 3 years.

6.7 **Commercial cooking systems**

6.7.1 Introduction

A commercial cooking system is a system that consists of commercial cooking equipment, exhaust hoods, filters, exhaust duct systems, fire extinguishing system and other related components designed to capture grease-laden vapors and exhaust them safely to the outdoors. The requirements as to the type of commercial cooking exhaust hoods required to be installed in connection with the commercial cooking equipment are set forth in the Mechanical Code. An FDNY permit is required to maintain or operate commercial cooking systems.



According to an NFPA report, more than one-third of fires in hotels, office buildings or facilities that care for the sick begin in the kitchen or cooking area. Properly cleaned and maintained commercial cooking facilities and fire extinguishing systems can protect the business, employees, customers and the public from fire damage.

6.7.2 Fire safety in commercial cooking facilities

FLS Director, should inform the fire safety regulations to the commercial cooking exhaust system facility owner. The information can be obtained from the FDNY released fire safety education brochure for restaurant or commercial cooking facility owners:

http://www1.nyc.gov/assets/fdny/downloads/pdf/business/Support/fire-safety-in-commercial-cooking-locations.pdf

In summary, FLS Director should educate the facility owner:

1. **What needs to be cleaned and by who?**

The cleaning of the exhaust system ducts and other system components above the hood must be done by an FDNY approved licensed companies and their certified employees (W-64/P-64 C of F). However, grease filters must be inspected and be cleaned by a trained and knowledgeable person (does NOT need to be a Certificate of Fitness holder).

The list of FDNY Certified Companies can be found on the following website:

Approved Companies with Electrostatic Precipitators in the exhaust duct

http://www1.nyc.gov/assets/fdny/downloads/pdf/business/approved-companies-commercial-cooking-precipitator.pdf

Approved Companies without Electrostatic Precipitators in the exhaust duct

http://www1.nyc.gov/assets/fdny/downloads/pdf/business/approved-companies-commercial-cooking.pdf

2. **Staff training requirements**

The owner or operator of commercial cooking equipment must train all food service staff in the proper procedure for the use of all components of the grease removal system, cleaning of filters, and the manual operation of the fire extinguishing system. Refresher training in the manual operation of the fire extinguishing system must be provided at least once every 6 months. Records of such training must be maintained on the premises.

3. **How to tell if the service company performed a good cleaning job?**

Because the cleaning is often performed afterhours without the presence of the facility owner, the owner should request the company to provide before and after pictures (see example pictures) with time stamps for proof of work. Insist on getting the proof. Insist on receiving copy of the checklist of work that was done during the cleaning.

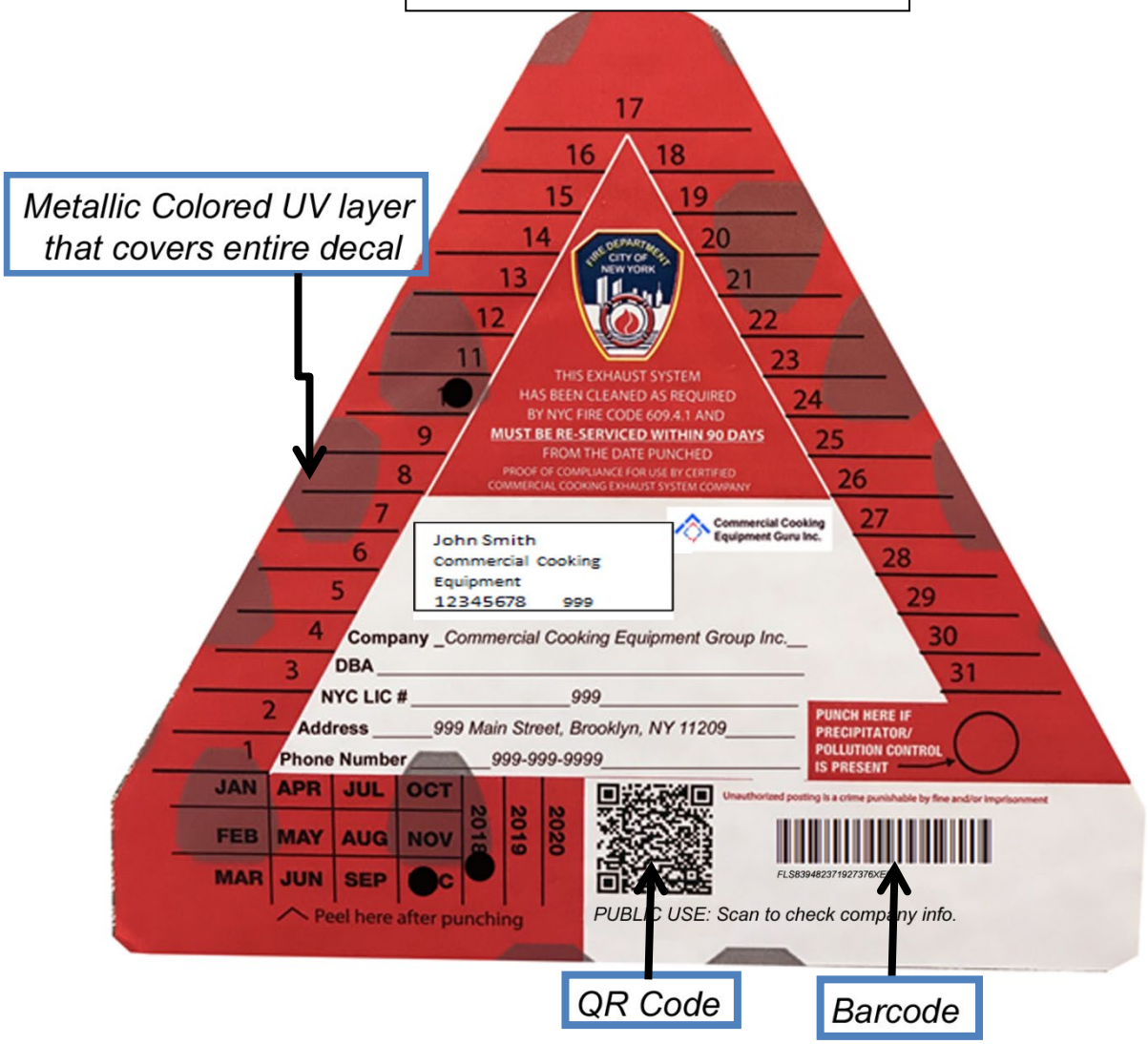
Heavy Grease

Light Grease

6.7.3 Signs and servicing stickers

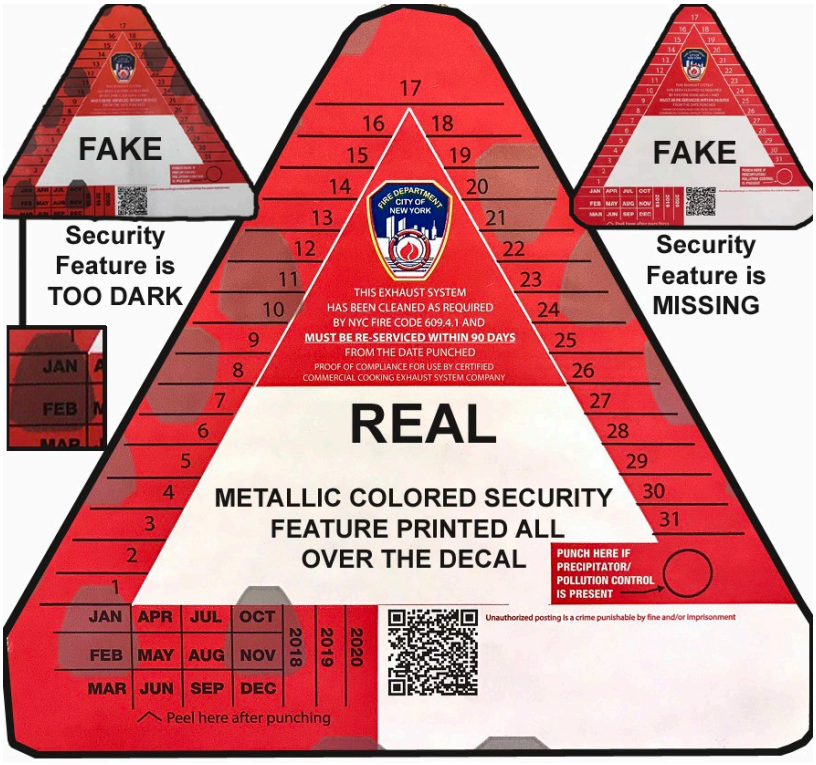
Decals must be attached to each hood after service. The decals are provided by the FDNY approved Commercial Cooking Exhaust Cleaning Companies to show proof of work completed. Old rangehood decals varied in size, shape, color and material which meant they could be easily counterfeited. In addition, they were harder to understand and identify for the FDNY and the public. The new FDNY rangehood decals are standardized, with several new security measures. Only FDNY approved rangehood companies can provide these new decals to businesses. New rangehood decals are easily identifiable by the FDNY and the public.

RANGEHOOD DECAL



The benefits of these decals are:

- FDNY is able to control decal issuance,
- Consistent decal design (which in turn is easily verified by FDNY and public),
- Each Certificate of Fitness holder will have an identifying stamp (with their full name, COF number and a company logo) and the employees who PERFORMED the work need to use their COF stamp on the tag after performing the work.
- Each decal will have a clear gloss embossed FDNY logo covering the whole decal,
- Decals will be virtually impossible to reproduce and counterfeit.



Starting February 15, 2019, the FDNY will only recognize new rangehood decals and will be issuing violations to businesses that don't have proper service compliance decals.

A placard stating, "the fire extinguishing system must be activated prior to using a portable fire extinguisher." and the instructions for manual operation of the fire extinguishing system must be posted, under glass or laminated, near the system's manual activation device. Information shall be clearly and concisely written.

6.7.4 Recordkeeping

Recordkeeping of all commercial cooking system inspections, tests, servicing, and other maintenance required by the Fire Code, including exhaust system inspection and cleaning, filter cleaning or replacement, semiannual fire extinguishing system inspection, and replacement of deep fat fryer high-limit controls must be maintained on the premises for a minimum of 3 years. **The FLS Director should advise the owner of commercial cooking equipment to have a cleaning company authorized by the FDNY and should keep the name of service company in the FLS logbook.**

6.8 Non-water fire extinguishing systems

6.8.1 Introduction

Non-water fire extinguishing systems are generally provided in lieu of a required sprinkler system where the nature of the fire hazard is such that water is not effective as an extinguishing agent. The use of a non-water fire extinguishing system must be acceptable to the Fire Department and the Department of Buildings. Non-water fire extinguishing systems include wet chemical, dry chemical, foam, carbon dioxide, Halon, clean agent, and water mist.

6.8.2 Individuals authorized to perform tasks

Non-water fire extinguishing systems must be visually inspected monthly by a trained and knowledgeable person to assess whether the system is in good working order. **The FLS Director or the Building Engineer may be designated as the person who is responsible to perform the visual inspection of these systems. All FLS Directors must know what non-water fire extinguishing systems are installed in their premises and the areas that these systems serve.**

A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation, and maintenance of the specific non-water fire extinguishing system is required to test, service and otherwise maintain such system semiannually (annually for foam fire extinguishing systems and water mist fire extinguishing systems).

6.8.3 Periodic inspection and testing requirements

Non-water fire extinguishing systems must be maintained in good working order at all times. Any fire protection system that is not in good working order must be repaired or replaced as necessary to restore such system to good working order, or, where authorized by the Building Code, removed from the premises.

Fire protection systems must be inspected, tested, serviced and otherwise maintained in accordance with the Fire Code, Fire Rules the referenced standards in the table below. Where required by this section, such inspection, testing, and maintenance must additionally comply with the rules. Where applicable, the requirements of the reference standards listed in the following table must be in addition to those requirements specified in the Fire Rules, NFPA standards, or in the manufacturer's maintenance procedure.

FIRE PROTECTION SYSTEM MAINTENANCE STANDARDS SYSTEM	**STANDARD**
Dry and wet chemical fire extinguishing systems	NFPA 17 and NFPA 17A
Foam systems	NFPA 11 and NFPA 16
Carbon dioxide fire extinguishing system	NFPA 12
Halon 1301 fire extinguishing systems	NFPA 12A
Clean agent fire extinguishing systems	NFPA 2001 (as modified by FC Appendix B)
Water mist fire extinguishing systems	NFPA 750

Non-water fire extinguishing systems summary table

Systems	**Commonly found in/with**	**Monthly visual inspection**	**Test, service and maintenance**	
			Qualified personnel	**Minimum frequency requirement**
Dry chemical fire extinguishing systems	flammable liquid storage rooms and at motor fuel dispensing areas.	required	A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific system.	semiannual
Wet chemical fire extinguishing systems	commercial cooking system	required		semiannual
Foam systems	commercial cooking system, flammable liquid drum storage area, hazardous waste facilities	Required (need to be conducted by a C of F holder)		annual
Carbon dioxide fire extinguishing system	flammable liquid storage rooms and at motor fuel dispensing areas.	required		semiannual

Clean agent fire extinguishing systems	IT systems, data storage rooms and manufacturing equipment, or irreplaceable items	required		semiannual
Halon fire extinguishing systems		required		semiannual
Water mist fire extinguishing systems	computer rooms or other energized electrical equipment areas	required		annual

The information provided on the following pages and boxed "good to know" is for reference purpose and won't be tested on the FLS Director school graduation exam or the FDNY FLS Director exams. The FLS Director should be familiar with the basic fire safety requirements if there is any such following system installed at the premises.

Good to know:

Wet and dry chemical fire extinguishing systems

- Wet chemical fire extinguishing systems are commonly used with commercial cooking system.
- Dry chemical fire extinguishing systems are commonly installed in flammable liquid storage rooms and at motor fuel dispensing areas.
- Wet and dry chemical fire extinguishing systems are required to be recharged after use or where an inspection or maintenance check indicates the need.
- At least once a month, an inspection must be conducted by a trained and knowledgeable person to assess that the system is in good working order. The monthly inspection, or "quick check" requirement, must verify the following:
  - The system is in its proper location.
  - The manual activation devices are unobstructed.
  - The tamper seals are intact.
  - The semiannual maintenance tag is in place.
  - The system shows no physical damage or condition that may prevent operation.
  - The pressure gauge(s) are in operable range.
  - The nozzle blowoff caps are in place and undamaged.
  - The protected equipment and the hazard have not been replaced, modified, or relocated.
- A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation, and maintenance of the wet and dry chemical fire extinguishing system must inspect, test, service, and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis. Tests must include a check of the detection system, alarms, and releasing devices, including manual stations and other associated equipment. Extinguishing agent containers must be checked to verify that the system has not been discharged. Stored pressure-type units must be checked for the required pressure. The cartridge of cartridge-operated units must be weighed and replaced at intervals specified by the manufacturer.

Good to know:

Carbon dioxide fire extinguishing systems

- Carbon dioxide fire extinguishing systems are commonly installed in large flammable liquid storage areas
- At least once a month, an inspection must be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A monthly update, or "quick check" (as required by FC904.8 and Section A.4.8.1 of NFPA Standard 12) must verify the following:
  - High-pressure cylinders are in place and properly secured.
  - Low-pressure storage unit pressure gauges show normal pressure, that the tank shutoff valve is open, and that the pilot pressure supply valve is open. The liquid level gauge should be observed. If at any time a container shows a loss of more than 10 %, it should be refilled, unless the minimum gas requirements are still provided.
  - Carbon dioxide storage is connected to discharge piping and actuators.
  - All manual activation devices are in place, and tamper seals are in place.
  - Nozzles are connected, properly aligned, and free from obstructions and foreign matters.
  - Detectors are in place and free from foreign matter and obstructions.
  - System control panel is connected and showing "normal-ready" condition.
- A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation, and maintenance of the carbon dioxide fire extinguishing system must inspect, test, service, and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.
- Liquid-level gauges of low-pressure carbon dioxide containers are required to be inspected weekly. Containers showing a content loss of more than 10 percent must be refilled.
- Auxiliary and supplementary components of carbon dioxide fire extinguishing systems, such as switches, door and window releases, interconnected valves, damper releases and supplementary alarms, are required to be manually operated annually to ensure proper operating condition.
- Carbon dioxide fire extinguishing system hoses must be examined at 12-month intervals for damage. At 5-year intervals, such hoses are required to be tested by a trained and knowledgeable person.
- Total flooding carbon dioxide fire extinguishing systems must not be installed to protect hazards within normally occupied areas. Previously installed total flooding carbon dioxide fire extinguishing systems installed to protect normally occupied areas were required to be removed by July 1, 2013, and a replacement fire extinguishing system installed.
- Warning signs are required in every protected space, entrance to protected space, nearby protected space, and outside each entrance to rooms containing a carbon dioxide fire extinguishing system. Typical warning signs are as follows:
  - In protected space,

    WARNING
    CARBON DIOXIDE GAS
    WHEN ALARM ACTIVATES VACATE IMMEDIATELY
  - At entrances to protected space,

    WARNING
    CARBON DIOXIDE GAS
    WHEN ALARM ACTIVATES DO NOT ENTER UNTIL VENTILATED
  - In areas nearby protected space,

    CAUTION
    CARBON DIOXIDE DISCHARGE INTO A NEARBY SPACE CAN COLLECT HERE. WHEN ALARM ACTIVATES VACATE IMMEDIATELY
  - Outside each entrance to rooms containing a carbon dioxide fire extinguishing system,

    CAUTION
    CARBON DIOXIDE GAS
    VENTILATE THE AREA BEFORE ENTERING. A HIGH CARBON DIOXIDE GAS CONCENTRATION CAN OCCUR IN THIS AREA CAUSING SUFFOCATION
  - Each Manual Actuation Station

    CAUTION
    CARBON DIOXIDE GAS
    ACTUATION OF THIS DEVICE CAUSES CARBON DIOXIDE TO DISCHARGE.
    BEFORE ACTUATING, BE SURE PERSONNEL ARE CLEAR FROM THE AREA.

Good to know:

Clean agent fire extinguishing systems

- Clean agents are electrically non-conductive and non-corrosive, and there should be no damage to electronics and delicate mechanical devices upon system discharge in such areas. Clean agent fire extinguishing systems may be ideal for IT systems, data storage rooms and manufacturing equipment, or irreplaceable items like customer/client records, intellectual property, art, antiques and artifacts.
- At least once a month, an inspection must be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation, and maintenance of the clean agent fire extinguishing system must inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.
- The extinguishing agent quantity and pressure of clean agent containers are required to be checked at 6-month intervals. Where a container shows a loss in original weight of more than 5 percent or a loss in original pressure, adjusted for temperature, of more than 10 percent, the container must be refilled or replaced. The weight and pressure of the container must be recorded on a tag attached to the container.
- Clean agent fire extinguishing system hoses are required to be examined at 12-month intervals for damage. Damaged hoses must be replaced or tested. Clean agent fire extinguishing system hoses are required to be tested at 5-year intervals.
- Enclosures protected by the clean agent fire extinguishing system are required to be thoroughly inspected at least every 12 months to determine if penetrations or other changes have occurred that could adversely affect agent leakage or change volume of hazard or both. Where the inspection indicates conditions that could result in not being able to maintain the clean agent concentration, they must be corrected. If uncertainty still exists, the enclosures are required to be retested for integrity.

Good to know:

Water Mist Fire Extinguishing Systems

- Water mist fire extinguishing systems are commonly found in computer rooms or other energized electrical equipment areas.
- At least once a month, an inspection must be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation, and maintenance of the water mist fire extinguishing system must inspect, test, service, and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on an annual basis.
- Water mist fire extinguishing systems are required to be flushed annually. Water tanks are required to be drained and refilled annually. After system operation, strainers, and filters are required to be cleaned or replaced as required.

Good to know:

Halon Fire Extinguishing Systems

- Halon (short for halogenated hydrocarbon) is nonconducting and described as a "clean agent," as it leaves no residue after being discharged. Halon fire extinguishing agents, include Halon 1211, Halon 1301, and a combination of the two. Halon 1211 is a "streaming agent," and more commonly used in hand-held extinguishers because it discharges mostly as a liquid stream. Halon 1301 is a "flooding agent," and discharges mostly as a gas, allowing it to penetrate tight spaces and behind obstacles and baffles. This property makes it ideal for use in engine nacelles and other tightly enclosed spaces commonly found in aircraft. Halons have been found to be an ozone-depleting substance, harmful to the Earth's stratospheric ozone layer. As of January 1, 1994, under the Clean Air Act, the United States has banned the production and import of Halons 1211 and 1301.
- At least once a month, an inspection must be conducted by a trained and knowledgeable person to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation, and maintenance of the Halon fire extinguishing system must inspect, test, service and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on a semiannual basis.
- The extinguishing agent quantity and pressure of Halon containers are required to be checked at least semiannually. Where a container shows a loss in original weight of more than 5 percent or a loss in original pressure of more than 10 percent, the container must be refilled or replaced. The weight and pressure of the container must be recorded on a tag attached to the container.
- Halon fire extinguishing system hoses are required to be examined at 12-month intervals for damage. At 5-year intervals, Halon fire extinguishing system hoses are required to be tested by a trained and knowledgeable person.
- Auxiliary and supplementary components of Halon fire extinguishing systems, such as switches, door and window releases, interconnected valves, damper releases, and supplementary alarms, are required to be manually operated at 12-month intervals to ensure such components are in proper operating condition.

Good to know:

Foam fire extinguishing systems

- At least once a month, an inspection must be conducted by a certificate of fitness holder to assess whether the system is in good working order. A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation, and maintenance of the specific fire extinguishing system, must inspect, test, service, and otherwise maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals at least on an annual basis.

6.8.4 Recordkeeping

Records of the monthly inspection of all non-water fire extinguishing systems must be maintained on the premises for a period of at least 3 years. Records must include the date the inspection was performed and the initials of the person performing the inspection.

Records of the semiannual inspection of non-water fire extinguishing systems (annual for foam and water mist fire extinguishing systems) by a licensed master fire suppression piping contractor must be maintained on the premises for a period of at least 3 years. Each system must have a tag or label indicating the month and year the maintenance was performed and identifying the individual and contractor performing the service. Only the current tag or label must remain in place.

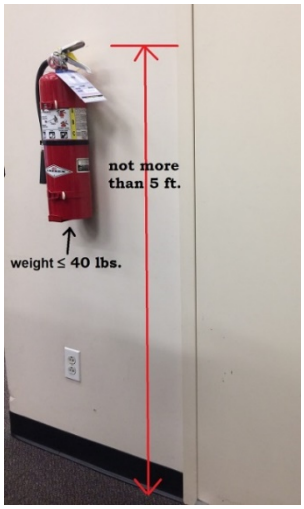
Chapter 7. OTHER FIRE SAFETY OPERATIONAL AND MAINTENANCE REQUIREMENTS

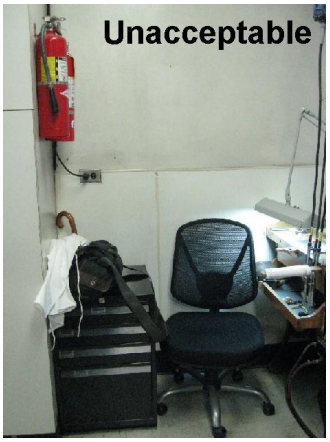
7.1 Portable fire extinguishers

FLS Directors and all FLS staff must be familiar with the different types of portable fire extinguishers (PFE's). FLS Directors and all FLS staff should know how to operate the extinguishers in a safe and efficient manner. They must know the difference between the various types of extinguishers and when they should be used. Portable fire extinguishers weighing 40 lbs. or less must be installed so that the top of the extinguisher is not more than 5 ft above the floor. Hand-held portable fire extinguishers weighing more than 40 lbs. must be installed so that the top of the extinguisher is not more than 3.5 feet above the floor. The clearance between the bottom of the extinguisher and the floor must not be less than 4 inches. In other words, **no fire extinguisher is allowed to be on the floor.**

Fire extinguishers must be located in conspicuous locations where they will be readily accessible and immediately available for use. These locations must be along normal paths of travel

weight ≤ 40 lbs →



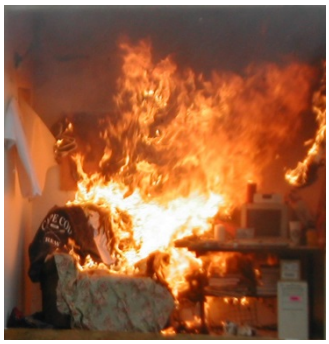


(1) For the fire extinguisher having 40 pounds or less, its top must not be more than 5 ft above the floor
(2) The fire extinguishers must be accessible and unobstructed.

(1) The bottom of the fire extinguisher must be at least 4 in above the floor.
(2) The fire extinguisher must be properly mounted.

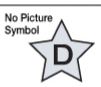
In the event that a fire extinguisher has been discharged, it must be fully recharged or replaced prior to being used again. Portable fire extinguishers are important in preventing a small fire from growing into a catastrophic fire; however, they are not intended to fight large or spreading fires. Portable fire extinguishers should only be used when there is an available means of egress that is clear of fire. By the time the fire has spread, fire extinguishers, even if used properly, will not be adequate to extinguish the fire. Such fires should be extinguished by the building fire extinguishing systems or **trained firefighters only.**

In case of any fire, 911 must be called. Fire extinguishers must be used in accordance with the instructions painted on the side of the extinguisher. They clearly describe how to use the extinguisher in case of an emergency. The FLS Director should be familiar with the use of portable fire extinguishers. When it comes to using a fire-extinguisher, remembering the acronym **P.A.S.S.** help to make sure it is used properly. **P.A.S.S.** stands for **P**ull, **A**im, **S**queeze, **S**weep. The FLS Director must also train the FLS brigade members and ensure they know how to use portable fire extinguishers.

	
A small-in-size fire that may be extinguished by a portable fire extinguisher	The fire has spread, portable fire extinguisher is NOT enough.

7.1.1 Different Types of Portable Fire Extinguishers

Fire extinguishers are classified by the type of fire that they will extinguish. Some fire extinguishers can only be used on certain types of fires, while other fire extinguishers are made to extinguish more than one type of fire. The portable fire extinguisher classification is indicated on the right side of the extinguisher. For more detailed information regarding the different portable fire extinguisher classifications and the types of fires they extinguish, reference the chart below.

Class of Fire	Type of Fire	Type of Extinguisher	Extinguisher Identification	Symbol
A	Ordinary combustibles: wood, paper, rubber, fabrics, and many plastics	**Water, Dry Powder, Halon**		
B	Flammable Liquids and Gases: gasoline, oils, paint, lacquer, and tar	**Carbon Dioxide, Dry Powder Halon**		
C	Fires involving Live Electrical Equipment	**Carbon Dioxide, Dry Powder Halon**		
D	Combustible Metals or Combustible Metal Alloys	**Special Agents**		
K	Fires in Cooking Appliances that involve Combustible Cooking Media: Vegetable or Animal Oils and Fats			

The most commonly sold portable fire extinguishers are labeled ABC extinguishers. Class ABC extinguishers are often the primary portable fire extinguishers in offices, hotels, theaters, and classrooms. Class ABC extinguishers are dry chemical extinguishers that can be used to extinguish regular combustible fires, flammable liquid fires, and fires involving electrical equipment. ABC extinguishers are usually red in color and range in size from 5-20 lbs. The pictures below show an example of a Class ABC portable fire extinguisher.

Class A portable fire extinguishers are available but are not as prevalent as Class ABC extinguishers. Class A portable fire extinguishers are also known as Air Pressurized Water (APW) fire extinguishers. Water is an extinguishing agent for regular combustibles.

Class A fire extinguisher

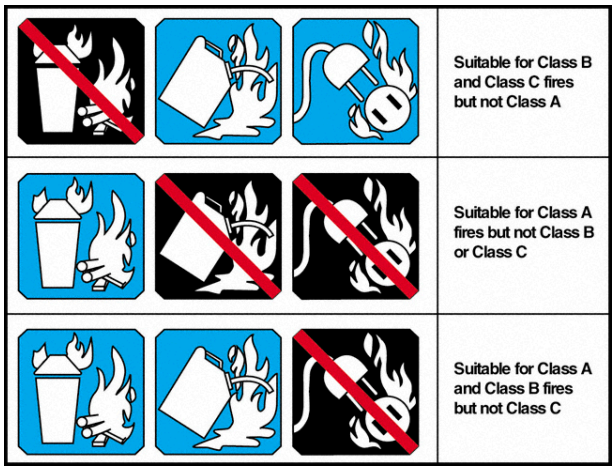
These extinguishers are usually silver in color and approximately 3 feet in height and weigh approximately 25 lbs. Class A portable fire extinguishers are useful in buildings and occupancies that primarily contain Type A combustible materials. When an occupancy is classified as a low hazards occupancy (e.g. where the quantity and combustibility of Class A combustible materials is moderate), at least one 2-A fire extinguisher (i.e. 2.5 gallon water extinguisher) is required every 3,000 square feet. These PFEs should ONLY be used on ordinary combustible fires. The picture to the right shows an example of a typical Class A portable fire extinguisher.

Portable fire extinguishers with a classification of "BC" are used to extinguish flammable liquid fires and electrical equipment fires. Portable fire extinguishers with a classification of just "B" or a classification of just "C" do not exist. "BC" portable fire extinguishers are red in color and range in size from five 5-100 lbs. or larger. Carbon Dioxide portable extinguisher is one common Class BC portable fire extinguishers. An example of a BC portable fire extinguisher is shown in the picture.

As mentioned above, a portable fire extinguisher with just a "C" classification does not exist. The "C" classification indicates ONLY that the extinguishing agent is a nonconductor and is safe to use on live electrical fires. "C" fires will have either an "A" component, such as ordinary combustibles around the electrical item, or a "B" component such as an oil filled transformer or some electrical device involving flammable liquids. This is the reason "C" classifications are only attached to either a "B" or "AB" fire extinguisher. This classification specifies the fire extinguisher that is most appropriate for extinguishing the fire.

Class K portable fire extinguishers are often found in kitchens and are used to extinguish combustible cooking fluids such as oils and fats. There are different extinguishing agents found in fire extinguishers labeled Class K. Some of these extinguishing agents are dry and some are wet. Potassium bicarbonate is used in some dry chemical fire extinguishers, and a chemical mist is used in some wet chemical fire extinguishers. The extinguishing agents in a Class K fire extinguisher are sometimes electrically conductive and should only be used AFTER the power

has been turned off in the electrical appliance. An example of a Class K fire extinguisher is shown in the pictures below:



Portable fire extinguishers are labeled so users can quickly identify the classes of fire on which the extinguisher will be effective. The marking system combines pictures of both recommended and unacceptable extinguisher types on a single identification label. The left chart is an example of typical labels.

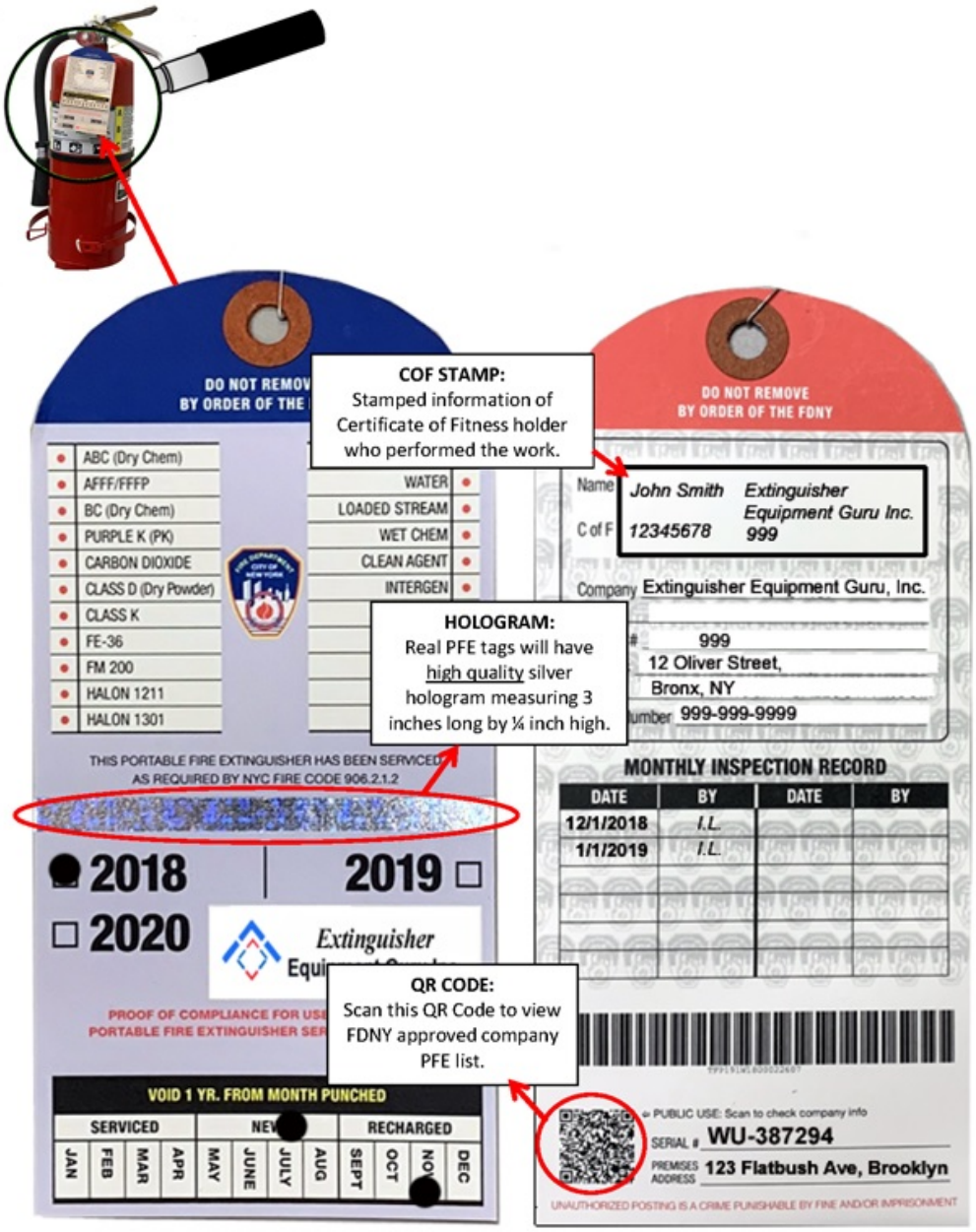
7.1.2 Portable fire extinguisher tags, inspection and servicing

(1) Portable fire extinguisher (PFE) tags

Installed portable fire extinguishers must have an FDNY standard PFE tag affixed. This tag will have important information about the extinguisher. New standard PFE tags (as the following image) will begin appearing at premises starting in November 2018. By November 15, 2019, all portable fire extinguishers must have the new PFE tags. The FDNY will only recognize new PFE tags and will be issuing violations to business that have PFE installed without a proper tag.

A real hologram strip shown on the tag is 3 inches long by ¼ inch wide. Counterfeit tags will NOT have a high quality silver hologram. The hologram on a counterfeit tag will NOT change color as it is moved against the light.

If your PFE tags look different than the one pictured above, contact your supervisor. If you suspect your PFE is a counterfeit, contact FDNY immediately by e-mail: Tags.Decal@fdny.nyc.gov



(2) Inspection and servicing

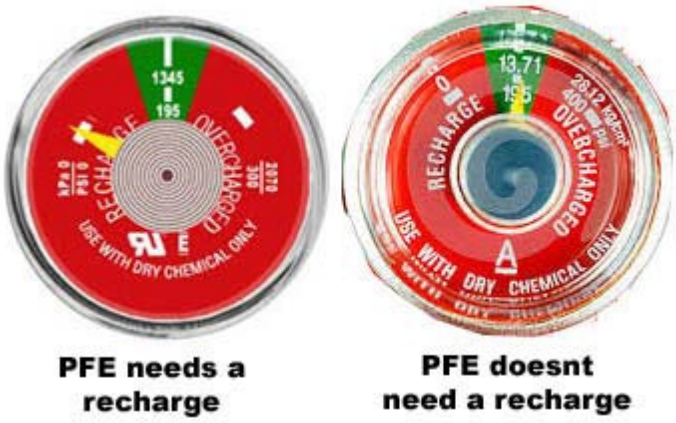
MONTH INSPECTION

The portable fire extinguishers are required to be checked monthly. The owner of the business is responsible to select a person to do a monthly inspection. This monthly inspection is called a "quick check".

The QUICK CHECK should check if:

- the fire extinguisher is fully charged;
- it is in its designated place;
- it has not been actuated or tampered with;
- there is no obvious or physical damage or condition to prevent its operation.

The information of the monthly inspection record must include the date of the inspection, the name/initials of the person who did the inspection. This monthly quick check is documented on the back of the PFE tag or by an approved electronic method that provides a permanent record.



PFE needs a recharge

PFE doesnt need a recharge

ANNUALLY SERVICING

At least annually all Portable Fire Extinguishers must be serviced by a W-96 Certificate of Fitness holder from FDNY approved company.

7.1.3 Portable fire extinguisher annual servicing

Servicing is a thorough examination of the portable fire extinguisher. It is intended to give maximum assurance that the portable fire extinguisher will operate effectively and safely. It also includes any necessary repair or replacement. Servicing the portable fire extinguisher will reveal if hydrostatic testing or internal maintenance is needed. Portable fire extinguishers must be serviced **at least annually** or at the time of hydrostatic testing, or when physical damage to the cylinder is visible during a monthly inspection. Portable fire extinguishers removed for servicing must be replaced by a similar PFE and must be of at least equal rating. The annual servicing must be performed by one of the FDNY approved companies for servicing portable fire extinguishers:

http://www1.nyc.gov/assets/fdny/downloads/pdf/business/approved-companies-full-service-portable-fire-extinguisher.pdf

A W-96 Certificate of Fitness holder employed by an FDNY approved company is required to service, maintain, and/or recharge a portable fire extinguisher**.** FLS Directors are responsible for making arrangements to have all the extinguishers serviced by a qualified Certificate of Fitness holder (W-96) and by an FDNY approved company. After each annual inspection W-96 COF holder will replace the PFE tag. The information of the annual inspection record must be indicated on the new PFE tag.

An FDNY released fire extinguisher brochure is available on the following website:

http://www1.nyc.gov/assets/fdny/downloads/pdf/business/Support/portable-fire-extinguishers-in-your-business.pdf

7.2 **Hot work operations**

7.2.1 Introduction

Hot work operations and the equipment and materials associated with such operations represent a significant fire hazard. Hot work creates sparks, slag and heat. Materials such as acetylene, LPG, and oxygen are used in gas welding and torch operations. Electric current is used in arc welding. Hot work is often conducted in buildings that were not designed for these materials and hazards, including buildings undergoing renovation or repairs. An important factor in avoiding ignition hazards is preparing for and monitoring hot-work operations.

7.2.2 Permit and supervision

Certificate of Fitness

- Certificate of Fitness (G-60) is needed for conducting any of the following torch operations:
  - An oxygen-fuel torch using any amount of oxygen and flammable gas
  - Any torch operation for torch-applied roof system
- Certificate of Fitness (F-60) holder must be present to perform fire watch during hot work operations at the following locations:
  - Construction sites;
  - Rooftop operations and in conjunction with torch-applied roof system operation;
  - In any building or structure when the torch operation is conducted by a person holding an FDNY permit for torch operation.

Permit

An FDNY permit is required to conduct hot work using oxygen and a flammable gas.

Hot work program responsible person

Whenever hot work is performed in any building or structure, on a building roof, or on a building setback, the owner must ensure that such work is performed in accordance with the Fire Code and must designate a responsible person (e.g. FLS Director) to ensure compliance.

The responsible person must ensure that a permit has been obtained from the Fire Department when one is required and ensure that the hot work is performed in compliance with the terms and conditions of the permit. The responsible person must inspect the hot work site prior to issuing a hot work program authorization and periodically monitor the work as it is being performed to ensure there are no fire safety hazards.

Hot work operations must be conducted under the general supervision of the responsible person. The responsible person must maintain "pre-work check" reports.

7.2.3 Operational requirements

Authorized work areas

Hot work must be performed:

- in areas designated for hot work operations, or
- areas authorized by the responsible person.

Hot work must not be performed:

- in areas where the sprinkler protection is impaired.
- in areas where ignitable vapors are present.
- in areas where readily ignitable material is present.

Hot work operations involving cutting or welding must be conducted at least 35 feet from combustible materials and combustible waste or must be provided with appropriate shielding to prevent sparks, slag, or heat from igniting exposed combustibles. All other hot work operations must be conducted at least 25 feet from combustible materials and combustible waste or must be provided with appropriate shielding to prevent sparks, slag, or heat from igniting exposed combustibles.

Hot work program authorization

- A hot work program authorization bearing the signature of the responsible person must be obtained for any project conducted on a premises involving hot work operations by the person in charge of such hot work operations. Hot work authorizations, issued by the responsible person, must be available for inspection by any representative of the department during the performance of the work and for 48 hours after the work is complete.
- The hot work authorization must be posted at the work site prior to commencing such work.

Pre-hot work check

Before hot work is authorized and at least once per day while the authorization is in effect, the hot work area must be inspected by the responsible person to ensure that it is a fire safe area.

A pre-hot work check must be conducted by the responsible person prior to work to ensure that all equipment is safe and hazards are recognized and protected. A report of the check must be kept at the work site during the work and for a minimum of 48 hours after work is completed and made available for inspection by any representative of the department. The pre-hot work check must be conducted at least once per day and must verify the following:

- The hot work equipment is in good working order.
- The hot work area is clear of combustibles and flammable solids or that such materials present in the area are protected in accordance with Fire Code.
- Exposed construction is of noncombustible materials or, if combustible, is protected.
- Openings are protected.
- Hot work area floors are clear of combustible waste accumulation.
- Fire watch personnel, where required, are assigned.
- Approved actions have been taken to prevent accidental activation of fire extinguishing systems and detection equipment. **Sprinkler system protection must not be shut off or impaired while hot work is performed unless approved by the commissioner.** Where hot work is performed close to sprinklers, noncombustible barriers or damp cloth guards must shield the individual sprinkler heads and must be removed when the work is completed. If the work extends over several days, **the shields must be removed at the end of each workday**.
- Approved precautionary measures must be taken to avoid accidental operation of automatic fire detection systems during hot work operations. For example, the fire alarm system (e.g. smoke detectors) may need to be taken off-line during the hot work operation to avoid unwarranted alarms. The date and time the alarm system was taken off-line, the reason for such action, the name and operator number of the person notified at the central station (or other evidence of notification satisfactory to the Department), and the date and time the system was restored to service must be entered in the alarm log book in each such circumstance.
- Portable fire extinguishers and fire hoses (where provided) are operable and available.
- All persons performing hot work possess certificates of fitness, where such certificates are required.
- All persons performing hot work requiring a permit possess a site-specific permit or citywide permit authorizing such work.

Fire watch

A fire watch must be maintained and fire guards provided in accordance with Fire Code. A fire watch must be maintained during ALL hot work operations. The fire watch must continue for a minimum of 30 minutes after the conclusion of the work. The commissioner, or the responsible person implementing a hot work program may extend the duration of the fire watch based on the hazards or work being performed.

The fire watch must observe the entire hot work area. Hot work conducted in areas with vertical or horizontal fire exposures that are not observable by a single individual must have additional personnel assigned to ensure that exposed areas are monitored.

Persons conducting a fire watch must keep constant watch for fires with respect to the areas being monitored in connection with hot work operations. **The persons conducting a fire watch must not have other duties**.

Where hose lines are required, they must be connected, charged, and ready for operation. A minimum of one portable fire extinguisher complying with the requirements of Fire Code and with a minimum 2-A:20-B:C rating must be provided and readily accessible within a 30 feet travel distance of the location where hot work is performed and where the fire guards are positioned.

The fire watch for torch operations conducted at the following locations must be conducted by F-60 fire guards:

- **Construction sites**

An F-60 fire guard must be provided for each torch in operation at construction sites, except that a single fire guard may be designated to conduct a fire watch for more than one torch operation on the same floor or level if each torch operation is not more than 50 feet from the fire guard, as measured by the actual path of travel, and the field of view of such fire guard encompasses all of the horizontal fire exposures of such torch operations.

- **In any building or structure, when the torch operation is conducted by a person holding a citywide permit for torch operations.**
- **On any rooftop or in connection with any torch-applied roofing system operation.**

If the torch operation is being conducted at or near the edge of an unenclosed floor of a building, or near a floor opening or other location where sparks and slag may travel to one or more lower floors or levels, a fire guard must conduct a fire watch on each lower floor or level containing combustible surfaces or materials within 35 feet of the area of such floor or level that potentially would be exposed to such sparks or slag. Prior to commencement of the torch operation, the fire safety manager or responsible person must inspect the lower floors or levels and take all necessary and appropriate precautions to protect any combustible surfaces and materials that potentially would be exposed to sparks and slag from the torch operation. A certification to that effect must be made on the hot work authorization.

Exception:

1. A fire watch is not required on the floors or levels below a torch operation on a construction site when:
   1.1. the torch operation is not being conducted at or near the edge of an unenclosed floor of a building;
   1.2. the floor upon which the torch operation is being conducted is of noncombustible construction;
   1.3. there are no floor or exterior building openings within 35 feet of the torch operation; and
   1.4. prior to commencement of the torch operation, the fire safety manager or responsible person conducts an inspection and takes the precautions required pursuant to Fire Code.
2. Notwithstanding the foregoing exception, if sparks or slag generated by the torch operation are observed to extend beyond 35 feet, thereby potentially exposing lower floors or levels, the torch operation must be immediately discontinued, and the floors or levels below must be inspected for any fire condition. If there is any potential exposure surfaces or materials on the floors below from such sparks and slag,

noncombustible barriers must be provided and any other necessary or appropriate precautions must be taken. If such barriers and precautions fail to block the passage of sparks and slag, a fire watch must be established on the floors or levels below.

It is important to understand the code-required distinction between a fire watch and a fire guard. Not all individuals responsible to maintain a fire watch must possess an F-60 certificate of fitness.

7.2.4 Recordkeeping

The responsible person for the hot work area must maintain "pre-hot work check" reports in accordance with Fire Code. These reports must be maintained on the premises for a minimum of 48 hours after work is complete.

Hot work authorizations must be available for inspection during the performance of the work and for 48 hours after the work is complete.

7.3 **Flame-resistant decorations**

7.3.1 Introduction

The requirements for flame-resistant decorations are intended to limit flame spread that can transform a small fire into a major conflagration. Rapid flame spread was responsible for fires in places of assembly and other public gathering places that resulted in large loss of life, such as the Cocoanut Grove nightclub fire that killed 492 people in 1942. This fire was thought to have started when a lightbulb in the basement cocktail lounge came in contact with the cotton cloth that had been applied to the ceiling for decorative purposes. Post-fire testing of the cotton cloth indicated that it had a flame spread rating of 2,500, more than 33 times the maximum flame spread in today's standards. This factor, in addition to impediments to egress, led to one of the worst fire disasters in history. The need for these regulations was demonstrated again with the February 2003 Station Nightclub fire in West Warwick, Rhode Island, in which 100 people died. The soundproofing material in the nightclub was not approved for such use and was a major factor in fire spread.

In addition to flame spread ratings of surface materials, certain furnishing types and vegetation, such as Christmas trees, pose a large fire hazard because of the potential fire size and intensity. The materials used in furnishings have changed dramatically from those used in the past and many more plastics are now used for decoration and furnishings. Plastics not only burn more vigorously than materials such as cotton and wood but also produce more toxic fire effluents.

The overall purpose of fire-resistant materials is to ensure that decorations, furnishings, and vegetation do not significantly create or add to fire hazards within buildings. The provisions focus on occupancies with specific risk characteristics, such as vulnerability of occupants, density of occupants, and lack of familiarity with the building.

7.3.2 Operational requirements

Supervision

Flame-retardant treatment of a material or item must be conducted under the personal supervision of a C-15 Certificate of Fitness holder.

Occupancies requiring flame-resistant decorations

In Group A, E, I and M occupancies, common areas in Group R-1 (e.g. Hotels), R-2, and B (e.g. office) occupancies, and any building or structure used as a place for public gathering, curtains, draperies, hangings and decorations are required to be made of a flame resistant material or be treated to be made flame resistant. This does not apply to decorations being displayed solely for sale in any building or as a work of art in any museum or art gallery; to guest rooms in hotels and motels, private offices in commercial buildings; or to houses of worship.

Documentation of flame-resistant materials

R805-01 sets forth the standards, requirements and procedures for the testing and certification of flame-resistant decorations. Decorations required to be of a flame-resistant material that are installed or maintained in any premises must not be installed or maintained until the owner first files an affidavit of flame resistance for such decorations with the Fire Department. The affidavit must be executed by a C-15 Certificate of Fitness holder, and must indicate that the material is inherently flame-resistant, or that he or she personally supervised the flame-retardant treatment of the material.

Display of natural trees

Cut natural trees may be displayed in a building, except in Group A, B, E, I-1, I-2, I-3, I-4, M, R-1, and R-2 occupancies and any building or structure used for a public gathering. Notwithstanding the foregoing occupancy restrictions, cut natural trees may be displayed in houses of worship and dwelling units in Group R-2 apartment house occupancies.

Natural trees, except conifers, may be stored and displayed in a building provided they are maintained in a healthy condition and are not allowed to become dry. It is unlawful to store or display natural trees that are conifers in any building.

Display of natural decorative greens

Natural decorative greens may be displayed in buildings on a temporary basis. The display of natural decorative greens in Group A, E, I, and M occupancies, in common areas of Group R-1, R-2, and B occupancies, and any building or structure used for a public gathering, except display of works of art in museums and houses of worship, must comply with the restrictions set forth in FC804.5.3.

7.4 **Portable fueled equipment**

Portable fueled equipment, including snow blowers, portable generators, power washers, weed trimmers, and lawn mowers, must not be used indoors. Portable fueled equipment must be stored outdoors unless stored in an FDNY approved indoor storage area.

If stored indoors, portable fueled equipment and fuel used in such equipment should not be stored below grade. Such fuel must be stored in an FDNY approved area, in a flammable liquid storage cabinet (if more than two and one half gallons of gasoline are stored), and in quantities that do not exceed amounts that are incidental to and reasonably necessary for the use of such equipment.

7.5 **Fumigation and insecticidal fogging operations**

7.5.1 Introduction

Fumigation and insecticidal fogging operation are methods of pest control to suffocate or poison the pests within. They could be used to control pests in buildings. They are hazardous operations because the chemicals used are toxic to most forms of life, including humans. Improper operation may cause injuries, fire, or explosions. Fumigation and insecticidal fogging operations within buildings and structures must be conducted in accordance with the Fire Code. A proper notification must give the location of the enclosed space to be fumigated or fogged.

7.5.2 Companies and individual certifications

Fumigation and insecticidal fogging operations must be conducted by or under the personal supervision of a person holding a W-97 Certificate of Fitness. This person must be an employee of an FDNY Certified fumigation and insecticidal fogging operation company. The list of FDNY certified company could be found in the following website, the list is updated on a monthly basis:

http://www1.nyc.gov/assets/fdny/downloads/pdf/business/approved-companies-fumigators.pdf

7.5.3 Operational requirements

Fire suppression systems

Fumigation and insecticidal fogging operations must require that fire alarm systems be taken out of service during such operation to avoid unwarranted alarms. The date and time the alarm system was taken off-line, the reason for such action, the name and operator number of the person notified at the central station (or other evidence of notification satisfactory to the Fire Department), and the date and time the system was restored to service, must be entered in the alarm log book in each such circumstance.

Notification

The Fire Department shall be notified in writing at least 48 hours in advanceto the Complaint Desk by emailing FPCU@fdny.nyc.gov. Notification shall give the location of the enclosed space to be fumigated or fogged, the occupancy, the fumigants or insecticides to be utilized, the person or persons responsible for the operation, and the date and time at which the operation will begin. Cold ULV fogging does not require any notification. Written notice of any fumigation operation shall be given to all affected occupants of the building, structure, or portion thereof in which such operations are to be conducted, with sufficient advance notice to allow all such spaces to be vacated in an orderly manner. Such notice shall inform the occupants as to the purposes and anticipated duration of the fumigation operations.

7.6 **Rooftop requirements**

7.6.1 Rooftop gardens and landscaping

Rooftop gardens and landscaping must be maintained in a healthy condition and must not be allowed to encroach upon areas required to be kept clear. Vegetation must be regularly pruned for these purposes and vegetation capable of being ignited must be regularly cleared and removed from the rooftop and the building. Portable fueled equipment, including flammable and combustible liquid fuels, used for the maintenance of rooftop garden and landscaping vegetation must be stored in accordance with the Fire Code requirements.

Rooftop gardens or landscaping exceeding 250 square feet must be provided with a rooftop garden hose connected to an approved water supply. Where the size of the rooftop garden, extent of landscaping, type of vegetation, and/or premises maintenance history warrant, the FDNY may require installation of an irrigation system or other approved method of hydration to ensure proper maintenance of the vegetation.

7.6.2 Rooftop overcrowding

An overcrowding condition exists at a rooftop place of assembly or place of public gathering when the number of occupants present in any such place exceeds one person per 10 square feet of the rooftop area to be used for public gathering. For example, more than 120 people gathered in a 1,200 square feet area will be an overcrowding condition.

7.7 **Certificate of Fitness, FDNY Permit, company certification, and Certificate of Qualification requirements**

7.7.1 Certificate of Fitness (C of F)

A Certificate of Fitness (C of F) is a certification issued by the New York City Fire Department. These certificates are legally required for individuals conducting certain activities. The goal of the C of F program is to be sure that workers responsible for certain operations or activities are qualified in the performance of their duties. The C of F program is instrumental in preventing fires by helping to ensure that workers understand the safety hazards associated with the duties they perform.

Most certificates are valid for 3 years. Renewals can be completed online, by mail, or in person. The majority of renewals cost $15. Depending on the type of certificate, an exam may be required as a condition of the renewal. Lost certificates cost $5 to replace. If you need to change any information on the certificate, including mailing address, name (legal papers needed) or work location (you will need a letter from your employer and may need to take a new exam), the fee is $5.

7.7.2 Fire Code requirements for specific materials, operations and facilities

Certain materials, operations and facilities require a company certificate to conduct, an FDNY operating permit and/or are required to be under the supervision of a certificate of fitness holder or certificate of qualification holder. The following table outlines the certificate of fitness, certificate of qualification, FDNY permit, and Company Certification requirements for specific regulated materials, operations and facilities:

Topics	Required C of F or C of Q	Required Company Certification	FDNY Permit Required
Sprinkler system	S-12/S-15	No	No
Standpipe system	S-13/S-14	No	No
Fire Alarm system	S-95/FLSD: Visual inspection	No	No
	S-78/F-78: inspection & cleaning of smoke detectors	Smoke detector company	
	S-97/S-98: install, repair, service fire alarm system	Smoke detector company or Central station company	
Fire guard for out-of-service fire protection system	F-01	No	No
Fire & Non-Fire Emergency Drill Conductor	W-07 (Citywide) or F-07 (premises related)	No	No
Refrigerating system	Q-01	No	Yes
Emergency power system	Q-01 , FLSD , other licensed professionals (refer to Section 6.5.1 of this booklet)	No	Yes*
Battery system	B-29	No	No
Elevators-in-readiness	No	No	No
Non-water fire extinguishing systems	S-15 (for foam system)	No	No
Means of egress	No	No	No
Commercial cooking system	P-64/F-64/W-64	Commercial Cooking Exhaust System	Yes
Hot work operations	G-60: Torch operation F-60: Fire guard for torch operation	No	Yes
Flame-retardant treatment	C-15	No	No
Fumigation and insecticidal fogging operation	W-97	Fumigation and Thermal Insecticidal Fogging Operation	No
Storage, use & display of decorations	No	No	No
Emergency planning & preparedness	F-89/T-89	No	No
Portable fire extinguishers	W-96	Portable Fire Extinguisher Servicing	No

*emergency power system operating on fuel oil requires an FDNY permit for oil storage.

Permits
FC105.6 lists all permits required for materials, operations, and facilities regulated by the Fire Code. The following permits are commonly issued to building owners:

- Commercial cooking systems
- Compressed gases
- Flammable and combustible liquids
- Hot work operations
- Liquefied petroleum gases (LPG)
- Fuel oil storage
- Open flames (Places of assembly)
- Places of assembly
- Refrigerating systems

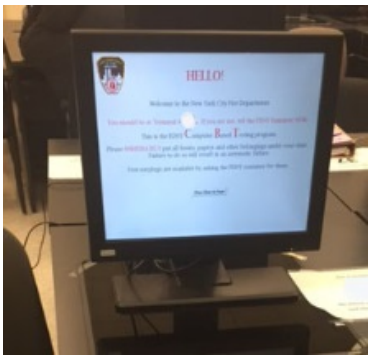
7.7.3 Certificate of Fitness (C of F) exam information

Study materials

The FDNY provides examination study material free of charge to help applicants prepare for most exams. Exam questions are taken directly from the study material. Study material is available online at http://www1.nyc.gov/site/fdny/business/all-certifications/all-certifications.page. Exam study materials can be picked upat FDNY Headquarters or by calling 718-999-1988.

The FDNY does not offer classes or training to prepare candidates for the Certificate of Fitness/Certificate of Qualification exams. There are a few exams (e.g. FLS Director) where applicants are required to attend an FDNY approved training school. Most exams do not require this. Check the notice of examination for each certificate for detailed information of any required training or experience for the certificate.

Computer-based exam



- *What is the exam like?*

Exams are administered on a "touch screen" computer based and multiple choice. Exams are administered in English. Applicants are permitted to bring a dictionary (paper copy only) to assist them in the exam. **No other outside papers, books, or electronic devices may be used during the test.**

- *What do I need to enter the testing location?*

Government issued photo ID is required to enter the building (examples: non-driver's license, driver's license, passport, or an IDNYC Municipal ID Card.)

- *When can I take a test? Should I schedule an exam?*

Walk-in exams are given Monday thru Friday 8 a.m. – 2:30 p.m. No tests will begin after 2:30 P.M. unless an appointment is scheduled. FLS Director computer based exams require an appointment. Please visit: http://www1.nyc.gov/site/fdny/business/all-certifications/cof-online-scheduler.page for more information on scheduling.

- *What happens when I arrive at the testing location?*

Upon entering FDNY Headquarters, all visitors and their belongings are screened. Weapons, tools and metal utensils are **not allowed** in the FDNY Headquarters:

- *How long will I be there?*

It depends on the exam and how many exams you are taking that day (max of 2 allowed). You should plan on at least 2-3 hours.

- *When will I get my results?*

You will obtain your results immediately upon completion of the exam. If you pass the exam, the certificate or letter of having passed the exam will be issued to you before you leave.

- *What if I fail?*

You will be given a failure report and a receipt before you leave.

- *Can I retake the test? If so, when?*

Yes. Generally, you can retake an exam the next business day.

- *Is there a fee to retake an exam?*

Yes. You will be required to pay the original application fee of $25 to retake an exam.

7.7.4 Fraudulent activity regarding certificates

All Certificates of Fitness and Certificates of Qualification are issued by the Fire Department. It is a credit-card size card that includes a photo ID. Certificates of Fitness and Certificates of Qualification are only issued by the Certificate of Fitness Unit of Fire Department at 9 Metrotech Center, Brooklyn. It is illegal for anyone to offer you a certificate without you having to go to the Fire Department to take a test. Both the person accepting the certificate and the person offering the certificate are breaking the law. It is also illegal to allow another person to take the examination for you. If you suspect a fraudulent certificate or other fraudulent activity regarding Fire Department certificates, you should contact the Bureau of Fire Prevention Certificate of Fitness Unit by telephoning (718) 999-1988.

Chapter 8. RECORD KEEPING REQUIREMENTS

8.1 Location and format

An FLS logbook must be maintained at an approved location on the premises (e.g. the Fire Command Center) for purposes of documenting compliance with the requirements of the Fire Code and this section relating to the FDNY plan, including any fires or non-fire incidents, identification of FLS staff on duty at the premises, and the conduct of drills and FLS staff training.

The FLS logbook must be a bound journal with consecutively numbered pages, unless the FDNY has authorized or approved an alternative form of electronic recordkeeping. The front cover must be marked "FLS Logbook" and contain the address of the building.

8.2 Entries

The information provided in this section may be provided as part of the reference material during the school graduation exam or the FDNY exam.

8.2.1 FLS staffing

Identification of the FLS Director and deputy FLS Director(s) (name and C of F number) and, availability of FLS staff members on duty each day or shift during regular business hours.

Any FLS staff changes, FLS on-site examinations, amendments, and date of the plan acceptance by the FDNY.

8.2.2 Daily entries

The name of the person who made the entry, the Certificate of Fitness number of the FLS Director on duty, and the time each tour of duty began and ended, must be entered in the FLS log book on a daily basis.

8.2.3 Fire incidents and any implementation of FDNY plan

(1) Date and time of the occurrence of any activation of the fire alarm system or any fire-related incident.

(2) Location of the alarm activation and activated detector type

(3) Any implementation of the fire safety and evacuation plan

Entries must be made of any evacuation, partial evacuation, or other implementation of the fire safety and evacuation plan, including the affected floors, in-building relocation areas to which they were directed or other directions given Any notifications to the FDNY or other agencies

Responding department unit and officer

8.2.4 Fire alarm system off-line entries

If the fire alarm is taken off-line, the following entries should be made:

(1) Date and time off-line

(2) Name and C of F number of the person who took off-line

(3) Reason off-line

(4) Central station name, phone number of the central station, and name and the C of F number (or ID number) of the operator

(5) Date and time restored

8.2.5 Non-fire emergency incidents and any implementation of FDNY plan

(1) Date and time of the occurrence of any non-fire emergency incident

(2) Any implementation of the non-fire emergency action plan

Entries must be made of any evacuation, partial evacuation, in-building relocation, shelter-in-place, or other implementation of the emergency action plan, including the affected floors, in-building relocation areas to which they were directed, or other directions given

(3) Any notifications to the FDNY or other agencies

(4) Responding department unit and officer

8.2.6 Drills

The record of each drill that is conducted must be included in the FLS logbook. It is recommended to include the following information:

(1) the date and time of the drill

(2) the person(s) conducting the drill, including the Certificate of Fitness number of any drill conductor

(3) the FLS staff members participating in the drill

(4) date and time that required notifications (to Department and other agencies) were made, and persons receiving such notifications

(5) identification of the floors or other areas of the building or occupancy, and the number of building occupants participating in the drill

(6) the type of drill conducted (fire or non-fire emergency;, type of scenario, if applicable, and/or stairway familiarization)

(7) the special needs addressed

(8) the problems encountered

(9) if an evacuation drill was conducted, the weather conditions and time required to accomplish the evacuation

(10) an outline of the drill content

The drill conductor, if not a member of the emergency preparedness staff of the building or occupancy, must maintain a record of each drill, the location of each presentation, the problems encountered, and an outline of the drill content.

8.2.7 FLS staff training

(1) the date of training session

(2) the person(s) conducting the training session and, the person's Certificate of Fitness number

(3) the persons attending the training session

(4) the type of training session conducted (live or computerized instruction)

8.2.8 Fire alarm, sprinkler, standpipe, and emergency power systems

The FLS logbook should include the record of any inspection, test, and maintenance of fire alarm, sprinkler, standpipe, and emergency power systems. The entries should include

(1) The date and, the name, and Certificate of Fitness or other license number of any contractor responsible for inspecting, testing and/or otherwise maintaining the building's sprinkler and standpipe systems.

(2) The job type (inspection, test, or maintenance)

(3) The frequency requirement (daily, weekly, monthly, etc.)

(4) Condition found and any action taken regarding to the condition

(5) Out-of-service record:
- Date and time
- Description of condition and affected areas
- Notification for out of service and the person receiving the notification
- Action taken
- Date and time restored
- Notification for restoring
- Responsible impairment coordinator

8.2.9 Phase I and Phase II elevator operations

The FLS logbook should include the record of any test of phase I and phase II elevator operations. The entries should include

(1) The date of testing,

(2) person who performed the test: Indicate the name and number of the Certificate of Fitness holder (if applicable), other building personnel (by job title) or a contractor (title and company name).

(3) condition found and any action taken regarding to the condition.

(4) verification that elevator keys are located in approved location.

8.2.10 Smoke control systems

The FLS logbook should include the record of any inspection and test of dedicated and/or non-dedicated smoke control systems. The entries should include

(1) The Date of the inspection/test
(2) Name of the person who performs the inspection/test
(3) Job type (inspection/test)
(4) Normal power and/or emergency power
(5) Condition found and any action taken regarding to the condition

8.2.11 Commercial cooking equipment systems

Indicate the name and number of the Certificate of Fitness holder (if applicable) or other building personnel (by job title). If inspection, testing, or other maintenance is to be performed by a contractor, indicate as much in the plan, and identify the contractor in the FSP logbook.

8.2.12 FLS staff on-site examinations

The FLS logbook should include the record of any on-site exam taking place in the premises. The entries should include:

(1) The on-site exam type
(2) Date and time of the on-site exam
(3) Name of the candidate who took the exam
(4) Name of the FDNY inspector who administered the exam

8.3 **Retention**

According the 2008 Fire Rule (404-01(s)(4) and 404-02(m) (3)(D)), the Fire Safety Plan (FSP) logbook must be kept at the premises for a period of at least three (3) years from the date of the last entry and the Emergency Action Plan (EAP) logbook must be kept at the premises for a period of at least five (5) years from the date of the last entry. If two books are combined into one logbook, the combined logbook must be kept at the premises for a period of five (5) years. All logbooks must be made available for inspection by Fire Department representatives upon request.

PART II. FIRE SAFETY TRAINING

Chapter 9. HISTORY OF FATAL FIRES IN DIFFERENT HIGH-RISE OCCUPANCIES

9.1 Challenge of high-rise building fires

(This section was citied from U.S. Fire Administration/Technical Report Series, Special Report: Operational Considerations for Highrise Firefighting, USFA-TR-082/April 1996, FEMA https://www.usfa.fema.gov/downloads/pdf/publications/tr-082.pdf)

High-rise buildings vary in age, size, height, construction, occupancy type, and design features, including the types of fire protection systems that are installed. Fires in high-rise buildings can present severe challenges to first responders.

- Access to floor levels that are beyond the reach of aerial apparatus is generally limited to the interior stairways. The use of elevators is usually restricted or prohibited because of safety concerns.
- Hundreds or even thousands of occupants may be exposed to the products of combustion (e.g. CO or smoke) while they are evacuating or unable to descend past a fire on a lower floor. The exits may be limited to stairways, which are also the only access for first responders coming up to assist with evacuation and to fight the fire.
- The ability to contain and control the fire is increasingly dependent on the construction of the building and the ability of sprinkler and/or standpipe systems to deliver water to the fire area.
- Ventilation can be much more complicated and critical in high-rises than in other types of structures. Vertical ventilation is often limited to stairways or elevator shafts, both of which may also have to be used to evacuate occupants. Horizontal ventilation, by breaking out windows, presents the risk of falling glass to those outside the building. The stack effect may cause smoke to rise rapidly through the vertical passages and accumulate on upper floors.

  Stack effect or chimney effect is the movement of air into and out of buildings. The air movement results from temperature and moisture differences. With stack effect, the temperature and pressure differentials between outside air and inside air dictate where the air currents will flow and where smoke is likely to follow. During cold weather, air/smoke is rushing up into the building from the bottom floors and out onto upper floors. During warm weather, when outside temperature is higher than within the building, the opposite can be true: air/smoke will be dropped down to lower floors in building; the smoke may travel to the floor below the fire floor.

  One of history's most prominent examples of cold/winter stack effect was the 1993 bombing of the World Trade Center in New York City. It occurred in February; the outside air temperature was 37°F and the temperature inside the towers was approximately 75°F. Four-and-a-half minutes after detonation on the Basement 2 level in the parking garage, there was a heavy smoke condition on the 110th floor of Tower 1. Because of the stack effect, the smoke can travel approximately 1,400 feet vertically in less than 5 minutes.
- Reflex time, or the amount of time it takes to react and take action, is usually much higher in high-rise buildings than in non-high-rise buildings. It often takes longer to travel from the ground floor to the fire floor than it takes to respond from the fire station to the building.
- Communications, command, and control can be very difficult in a high-rise fire. Radio trans-missions through a building's concrete and steel infrastructure may be compromised. Effective coordination and control of strategy and tactics are essential.

Several major fires have occurred in high-rise buildings where fire protection systems failed to work properly, creating situations where some of the most experienced and well- equipped fire departments could not control the fires. The lessons learned from historical high-rise fires have established that automatic sprinklers are the most effective way to prevent a major high-rise fire. FLS Director must work to ensure that all fire protection systems are tested regularly and function properly.

Some major problems have emerged from recent major high-rise fires across the country. These areas are as follows:

1. Water supply and functionality of fire protection systems

Water supply systems can fail under many circumstances. Closed valves may block the water supply to the system. A fire pump will fail if the main power supply or a backup supply fails. Fire Department Connections may be obscured from view, blocked, or relocated, especially during construction. Pressure reducing valves may be improperly set or improperly installed**.**

Electrical system failure can be catastrophic since many components of a high-rise fire protection system are powered by electricity. Many buildings have emergency generators in case the main feed to the building is lost. However, even with the presence of backup power systems, the entire system may fail if fire impinges on the main feed.

Stair shafts may become filled with products of combustion, even in buildings designed with protected, pressurized stairs. The First Interstate Bank fire, Meridian Plaza fire, and World Trade Center fire all demonstrated that positive pressure protection can be quickly lost when stairway doors are opened by evacuees and firefighters. Protected stairways intended to provide a safe exit path for both occupants and firefighters are transformed into chimneys carrying smoke and toxic gases.

Elevator failures have hampered operations in many high-rise fires. Some departments prohibit the use of elevators, especially when the bank serves the affected floor, while others allow first responders to use separate unaffected banks to transport personnel and equipment to staging areas. First responders are particularly dependent on elevators when the fire is on an upper level floor. The Meridian Plaza fire (mentioned in this booklet) demonstrated how firefighting efforts were hampered and delayed when an elevator system failed due to a power loss.

The failure of one component often leads to the failure of other components, generally because the failure allows the fire to grow so large that it impinges on other components or overpowers the ability of other components to function properly. Fire control is extremely difficult when multiple components fail.

2. Occupant evacuation

Recent major high-rise fires have shown that fire departments are likely to have serious problems evacuating occupants from a high-rise, particularly if systems fail, when there is a large volume of fire and no built-in sprinkler system, when occupants are not trained properly, or when the fire is not controlled rapidly. The World Trade Center bombing demonstrated the problems with evacuation when stairway pressurization systems failed. Even when pressurization systems work properly, however, stair shafts may become filled with the products of combustion because doors on the fire floor are propped open by hose lines and the effect of pressurization is lost as occupants open stairway doors to exit.

Both the First Interstate Bank fire and the Meridian Plaza fire could have trapped thousands of occupants had the fires occurred during weekday hours. The best way to protect high-rise building occupants from smoke and fire is to control the fire rapidly, and this is best achieved by a sprinkler system. Unfortunately, many existing buildings do not offer this protection, which means that fire departments may have to contend with large fires that pose serious evacuation problems.

In some cases, occupants may be safest if they remain in place or evacuate to at least three floors below their current floor instead of exiting the building. FLS Director should determine as quickly as possible in a fire incident whether a full, partial, or no evacuation is necessary, and communicate their evacuation plan to occupants by using the emergency voice communication system. Experience shows that occupants will need guidance with evacuation. This will require the assignment of FLS staff to assist specifically with evacuation.

Evacuation of a high-rise can be one of the biggest challenges in controlling a high-rise fire emergency. Firefighters depend on a prompt, organized evacuation by the FLS Director so that they only have to concentrate on rescuing disabled person, and on the fire attack. Unfortunately, building occupants do not always follow evacuation plans, and many persons may delay exiting and become trapped. This is why it is important for the FLS Director to conduct the required fire and non-fire emergency drills periodically which educate building occupants about the fire safety features of the building, the exits available, and the proper procedures to follow in case of an emergency.

9.2 **NFPA high-rise Building fires report**

(This section was cited from: NFPA's "High-Rise Building Fires," Marty Ahrens, August 2016. http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fires-by-property-type/high-rise-building-fires)

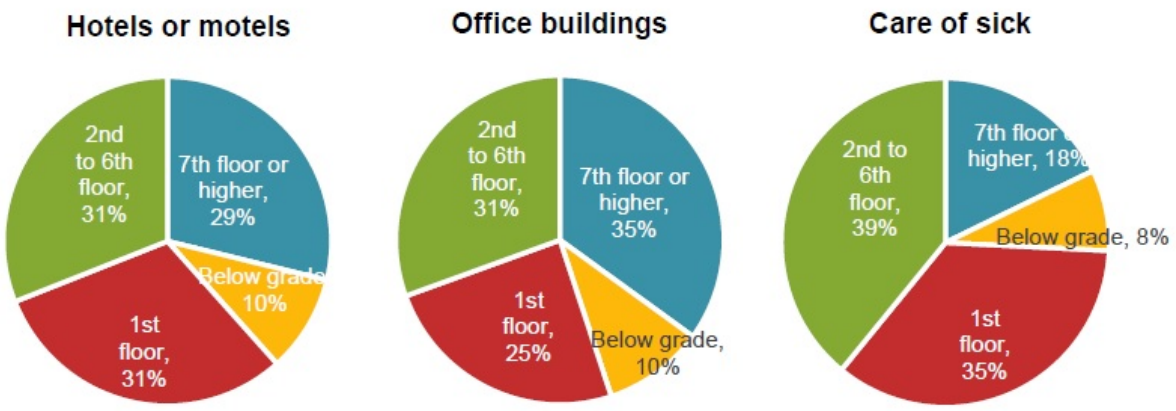
The NFPA report published in 2016 provides estimated annual averages of fires and associated losses in U.S. high-rise building fires during the five-year period of 2009-2013. It includes any fire in a structure at least seven stories in height above ground. Details are provided about high-rise fires in five occupancies: apartments or other multi-family housing, hotels, dormitories or dormitory type properties, facilities that care for the sick, and office buildings.

In 2009-2013, U.S. fire departments responded to an estimated average of 14,500 reported structure fires in high-rise buildings per year.

Five property use groups account for almost three-quarters (73%) of high-rise fires:

- Apartments or other multi-family housing (8,970 fires, 62% of all high-rise fires)
- Hotels (540 fires, 4% of high-rise fires)
- Dormitories (510 fires, 4% of high-rise fires)
- Offices (290 fires, 2% of high-rise fires)
- Facilities that care for the sick (260 fires 2% of high-rise fires)

The report indicates that most high-rise building fires begin on floors no higher than the 6th story. Ten percent of hotel and office building high-rise fires actually started below grade.



The kitchen or cooking area was the leading area of origin in hotels, office buildings, or facilities that care for the sick.

Top leading areas for hotels, office buildings and facilities that care for the sick:

- Hotel or motels: Kitchen or cooking area (40%); laundry room or area (8%); bedroom (7%); all means of egress including hallway, lobby, stairway, escalator, etc. (7%) and trash chute, area or container (4%)
- Office buildings: Kitchen or cooking area (31%), office (12%), machinery room or area or elevator machinery room (9%); unclassified equipment or service area (6%), all means of egress (4%).
- Facilities that care for sick: Kitchen or cooking area (39%); lavatory, bathroom, locker room or check room (6%); all means of egress (5%); common room, living room, family room, lounge or den (4%).

PART II. FIRE SAFETY TRAINING

Chapter 10. FIRE DRILL

10.1 Qualifications, timing, frequency, and participation

A fire drill conducted for purposes of compliance with Fire Code must be conducted by a person holding a Certificate of Fitness as an FLS Director, FEP Coordinator, or Drill Conductor. A fire drill conducted by a Drill Conductor in a building or occupancy requiring an FLS Director or FEP Coordinator must be conducted under the personal supervision of such FLS Director or FEP Coordinator. The fire drill must be conducted through live instruction.

Fire drills must be scheduled to maximize the participation of required drill participants. Drills must be scheduled in a manner that best assures the participation of regular building occupants. Drills may be conducted on different work shifts and/or during non-business hours to facilitate the participation of building occupants.

The frequency of fire drills and the building occupants required to participate must be as set forth in the following table:

Type of Building or Occupancy	Required Participation	Frequency
Group A	Regular building occupants. (guests and visitors are not required)	Semiannually
Group R-1 (except homeless shelters and dormitories)	Regular building occupants. (guests and visitors are not required)	Quarterly on each shift
Group R-1 homeless shelter and emergency shelters	All building occupants	Monthly on each shift
Group B office[a], or other occupancies requiring an FLS Director.	All building occupants	Semiannually
Group B colleges and universities, Group E educational, and Group R-1 dormitory	All building occupants	In accordance with NYS Education Law

a. **In the 2 years** following acceptance of Comprehensive Fire Safety and Emergency Action Plan, drills must be **conducted quarterly**.

Office buildings and other buildings with Comprehensive Fire Safety and Emergency Action Plans accepted for filing by the Department must continue to conduct separate fire and emergency action plan drills on separate dates.

10.2 Presentation requirements and techniques

The presenter must identify him or herself by name, title, and affiliation. The presenter must identify any emergency preparedness personnel or building staff present with whom building occupants should be acquainted, including the FLS Director, FEP coordinator, and other key FLS staff (e.g. FLS brigade members, building evacuation supervisors, wardens, searchers, etc.). When conducting a floor-by-floor presentation in an office building, the presenter should identify floor wardens and searchers. The FLS staff, including floor wardens and searchers, should wear their vests, hats and/or other indicia of authority so as to familiarize building occupants with the insignia.

All participants must be able to see and hear the presenter. Drills must be conducted in an area conducive to effective communication. Background noise and distractions should be eliminated to the maximum extent possible, but if it not feasible to do so, the presenter must be equipped with a means to amplify his or her voice so that the presentation can be heard clearly.

Drills must be conducted live on the floor or other area of the building on or in which building occupants are generally present, to ensure maximum participation of building occupants. To facilitate effective communication and the use of video or other visual enhancements, drills may be conducted in conference rooms in such areas.

Fire Department encourages owners and the FLS Director to make drills more interesting to building occupants and thereby make the information communicated more memorable. To that end,

(A) Building-specific presentations. Drills must be tailored to the building to make the presentation relevant to building occupants. This includes a building description and references to building features, occupancies and other relevant information that will assist building occupants in understanding the design and arrangement of the building and building systems and how they relate to the response to different types of emergencies.

(B) Visual enhancements. The Department encourages presenters to include visual enhancements to supplement their drill instruction. Floor plans can be used to illustrate stairway locations and evacuation routes, signs can be used to emphasize key words or concepts, and photographs or video can be used to illustrate fire or non-fire emergencies.

(C) Use of actual incidents and lessons learned. Whenever possible, illustrate the information being presented by reference to actual fires or non-fire emergencies, including those that received public attention, and the lessons learned from those incidents.

10.3 Persons with special needs

Every reasonable effort must be made to ensure the participation in drills of building occupants who have identified themselves (in accordance with emergency preparedness plan procedures) as having special needs that may require assistance in the event of an emergency. Their participation will aid in identifying and addressing their needs in advance of the emergency. Where such building occupants are not able to participate in a drill or it is not feasible to accommodate their needs during the drill, alternative arrangements must promptly be made to communicate in a suitable manner the information presented during the drill to such persons and consider their needs.

Explain to all drill participants that persons with special needs, who will require assistance in evacuating from the building or relocating within the building, including persons with disabilities, should identify themselves in accordance with the emergency preparedness procedures for the building or occupancy, so that the FLS staff are aware of their needs and take their needs into consideration. Explain what those procedures require. Encourage a person with special needs to introduce themselves to floor wardens, searchers, other emergency preparedness staff, and co-workers willing and able to provide emergency assistance, and inform them of their special needs. Encourage other building occupants to volunteer to assist persons with special needs in the event of an emergency.

10.4 General content of all drills

Drills must be conducted to enhance the fire and non-fire emergency preparedness of building occupants, including building staff and employees of building tenants. Drills must serve to familiarize building occupants with the proper actions to take in the event of a fire or non-fire emergency and fire prevention measures appropriate to the occupancy. Drill conductors must incorporate the following basic information in their presentation, with elaboration appropriate to the building or occupancy.

During the drill, the FLS Director should communicate the following information to the building occupants:

(1) Emphasize the importance of listening for and complying with the directions from on scene emergency responders or other lawful authorities.

(2) Explain that the FLS staff are trained to keep building occupants safe.

(3) Emphasize the importance of listening for their announcements and directions.

(4) Encourage building occupants to comply with the directions of building FLS staff, who are trained and in the best position to assess the safest response, but explain that building occupants should exercise their own best judgment if they are in immediate jeopardy, taking into consideration all known information and the guidance they are being given. For example, in a fire incident, direction may be given to evacuate a building through a designated stairway or exit, but if a building occupant assesses that he or she cannot safely reach that stairway or exit, the building occupant must exercise his or her own best judgment as to the safest course of action and should attempt to notify the FLS Director of an issue with the stairs.

10.5 **Content of fire drills**

The fire drills are being conducted to educate building occupants about the actions they should take in the event of a fire. The presenter must communicate the following information to the building occupants with respect to fire drills:

10.5.1 Notification of 911 and the FLS Director

Emphasize the importance of reporting any emergency to 911. In a fire drill, instruct building occupants to first use the manual pull station to activate the fire alarm system and to immediately call New York City 911 upon reaching a place of safety. In office buildings, the floor wardens will also communicate with the FLS Director via warden phone.

10.5.2 General building description

Describe the building in which the drill is being conducted. For example: "You are occupying a 30-story building built in 2004. It is of non-combustible construction, meaning that the building structure is made of steel and concrete. The building is equipped with a sprinkler system and a fire alarm system. There is a Fire Command CenterFire Command Center in the office building lobby staffed by a Fire and Life Safety director during regular business hours. The first three floors are occupied by stores and other retail businesses serving the public. Floors 4 to 20 are office spaces. Floors 21 through 30 are house apartments. The retail space has its own elevators and stairways. The office and apartment occupancies have separate lobbies and elevators, but share stairways." In a mixed occupancy building, such as the office/residential building, address whether the occupants of the other occupancy share the same means of egress or will otherwise interact with each other during an emergency.

10.5.3 Fire alarm system and method of notification

The presenter shall describe the type of fire alarm system that is installed in the building, or in the occupancy in which the drill is being conducted, and how it is used to notify building occupants of fires.
Describe the type of fire alarm system that is installed in the building, or in the occupancy in which the drill is being conducted, and how it is used to notify building occupants of fires. For example, explain a high-rise-type fire alarm system is designed to detect heat and smoke, and may also be manually activated.

(1) High-rise-type systems.

If a high-rise-type fire alarm system is in use, explain that it is designed to detect heat and smoke, and may also be manually activated.

(2) Manual/automatic fire alarm systems

If manual/automatic fire alarm system is in use, indicate whether it is designed to detect heat and smoke, or is only manually activated. Emphasize the heightened importance of an immediate response to the activation of a fire alarm in buildings, especially in those that are not fully protected by a sprinkler system.

(3) **Voice communication capability and notifications.**

State whether or not the fire alarm system has voice communication capability, , and describe the system's auditory and visual alerts (alert tones and strobe lights). Identify any areas of the building or occupancy not equipped with alerts. Distinguish the fire alarm system's loud, continuous tone or other alert sounds from the inquiry tone by which building occupants may be notified of a non-fire emergency. If there are any other means by which building occupants will be notified of a fire, explain these means. Address the fire alarm system's sequence of operation and the importance of relocating below the fire floor (typically at least three floors down) in conjunction with the emergency procedures to be followed (refer to 10.5.5 and 10.5.6).

(4) **Manual pull station.**

Identify the location of the system's manual pull stations. Explain how to operate a manual pull station and indicate whether it sends a signal to a central station or only rings in the building. Emphasize that the manual pull station is to be used only when fire or smoke conditions are actually observed, and not merely when there is the odor of smoke. Explain that using the manual pull station in the absence of observable flames or smoke can confuse emergency responders as to the location of the fire, given that smoke can quickly travel throughout the building. Also explain that the manual pull stations are not to be used during an active shooter emergency or to notify others of any other non-fire emergency, as it may cause building occupants to enter the stairways and/or evacuate the building when they should be sheltering in place.

(5) **Announcements.**

If the fire alarm system has voice communication capability and is programmed for a staged evacuation sequence of operation, advise *building occupants* to listen for an announcement when the *fire alarm system* activates. Advise building occupants to move toward the closest or designated stairway when the fire alarm sounds and, if no further information is forthcoming, to proceed down the stairs and exit the building. In a building or occupancy with an interior fire alarm system that alarms on all floors, advise *building occupants* to quickly and safely proceed to the closest stairwell and exit the building.

(6) **Warden phones.**

In office buildings equipped with warden phones, and in other buildings and occupancies equipped with telephones that directly communicate with the Fire Command Center or other emergency operations center, identify the location of such telephones, explain their purpose (to report fire conditions and/or the status of building occupants on the floor or other area) and demonstrate how to operate them. Emphasize the need to wait for the Fire Command Center to answer the call as warden phones typically operate on a single telephone line and multiple calls cannot be answered at once.

10.5.4 Means of egress

The presenter must identify all of the means of egress (such as hallways and stairwells leading to exterior doors and external stairs and fire escapes) in the building or, if the presentation is limited to occupants on a particular floor or area of the building, all the means of egress available on that floor or in that area, and any other areas that the building occupants on that floor or area may regularly access.

(1) Stairways

Describe and/or illustrate the location and letter designation of the stairways. State whether the doors in the stairways are locked to prevent reentry into the building, and, if so, on what floors re-entry is allowed (typically every fourth floor), and that they should unlock when the fire alarm activates automatically or there is a power outage. During the required stairwell familiarization drill highlight any unusual features (such as in-stairwell horizontal passageways). If there are access stairs between floors, emphasize that they are not designed for use during a fire because they are not enclosed, and therefore do not protect building occupants from smoke and may become unsafe during a fire. Explain that the activation of manual pull alarm system may not release the fail-safe doors automatically; the FLS Director has to manual release the doors after confirming there is a fire/smoke condition.

However, some old buildings under 100 feet may be allowed under the 1968 Building Code to lock all stairway doors to prevent reentry except at the street level. All occupants in these buildings must exit to the designated outdoor location.

(2) Fire tower

If the building has a fire tower, explain what that is, and identify the location where it can be accessed. **Fire tower stairway should be given priority for building occupants to use for evacuation.**

(3) External stairs and fire escapes

If the building or floor has external stairs or fire escapes, identify where those means of egress can be accessed. Explain that fire escapes are a secondary means of egress and should only be used if the primary means of egress (stairways) are not safe. Explain that fire escapes are not designed to hold a large number of persons at one time.

(4) Egress route and exit

For each stairway or other means of egress, describe the route of the means of egress and the location at which it terminates (the street name/number if outdoors, the building location if indoors). For example: "Stairway A, located on the south side of the building, just outside of the elevator lobby, goes to the building lobby, from which you can exit through the front entrance to Eighth Avenue. There is also a door in the rear of the lobby that leads to the service entrance/loading dock area on 50th Street. Stairway B, located on the south side of the building, near the freight elevator, exits directly onto 51st Street. There are two other stairways, on the third floor only, from inside the Auditorium and the Cafeteria, that exit directly onto 49th and 50th Streets, respectively. The doors to those facilities may be locked between 6 pm and 8 am."

(5) Areas of refuge

If the building has been designed with areas of refuge (also known as areas of rescue assistance) to allow persons to shelter in a designated area on each floor, identify the location of such areas and explain that they are designed to shelter building occupants if for any reason they are unable to evacuate the floor or exit the stairwell.

(6) Maintenance of self-closing doors

Emphasize the importance of not chocking open or otherwise interfering with the operation of self-closing doors, especially stairway doors. Explain that self-closing doors are designed to maintain a fire and/or smoke separation and that keeping them open allows a fire to spread and smoke to contaminate the stairways needed for occupant egress.

Explain whether the corridor doors are equipped with fail-safe device and when the device will be released.

(7) Elevators

Emphasize that elevators are not to be used during a fire, because the elevators may operate erratically; stop at the fire floor, exposing the passengers to unsafe conditions; lose power and trap passengers; and/or fill with smoke. Consult the Department's website for guidance with respect to occupant evacuation elevators that may have been installed in very tall buildings constructed since 2014.

10.5.5 Emergency procedures (in buildings of non-combustible construction)

When conducting a fire drill in a building of non-combustible construction, communicate the following information to building occupants:

(1) the sequence of operation of the fire alarm system, that is, whether the system is designed to ring only on the fire floor, floor above, and/or floor below, or throughout the building;

(2) what non-combustible construction means and why sheltering in place is recommended for building occupants if not in immediate jeopardy;

(3) building occupants may be directed to use a designated stairway;

(4) in a building with a fire alarm system programmed for a staged evacuation sequence of operation, the goal is to move to an area of safety below the fire floor. As such, building occupants generally only need to relocate several floors below the fire floor, rather than evacuate the building. Instruct building occupants that, unless directed otherwise, to relocate at least three floors below the floor upon which the fire alarm system is activated. Emphasize that evacuating higher up in the building or to the rooftop may increase the danger and make rescue more difficult;

(5) in a building with an interior fire alarm system that alarms on all floors, the goal is for occupants to quickly but safely proceed to the closest stairwell and exit the building.

(6) choosing to evacuate or relocate within the building, when one should shelter in place instead, may delay the Fire Department's response and unnecessarily expose building occupants to danger;

(7) the hazard of smoke inhalation, and the importance of ascertaining the presence of smoke in building corridors and stairways before evacuating. Due to the different ways smoke can spread in a high-rise building (the Stack Effect), stairways below the fire floor could become contaminated by the reverse flow of smoke;

(8) the importance of closing but not locking doors as they exit, and, if doors lock automatically, taking keys in case fire or smoke conditions prevents their evacuation or relocation and requires that they retreat to their point of origin; and

(9) if unable to safely evacuate the floor, building occupants should retreat to a room with a solid door, call 911, notify the 911 operator of one's location, and seal the spaces around the door with wet towels, duct tape, or other material to prevent or reduce smoke infiltration.

10.5.6 Emergency procedures (in buildings of combustible construction).

When conducting a fire drill in a building of combustible construction, the presenter must communicate the following information to building occupants:

(1) the sequence of operation of the fire alarm system, that is, whether the system is designed to ring only on the fire floor, floor above and/or floor below, or throughout the building;

(2) what combustible construction means, and that evacuation from the building is recommended if conditions allow, given the risk of fire spread to the building structure. Building occupants should take the stairs to the street level or other main floor and exit the building, unless directed otherwise;

(3) in buildings not protected by a sprinkler system, emphasize the importance of responding immediately to a fire alarm, as a fire can double in size every minute; and.

(4) each of the items set forth in Section 10.5.5 of this book (4) through (9).

PART II. FIRE SAFETY TRAINING

Chapter 11. FLS DIRECTOR RESPONSIBILITIES IN FIRE EMERGENCIES

11.1 Inspection and prevention of fires

The FLS Director must ensure that the building's fire protection systems and other equipment and operations affecting building fire safety are inspected, tested and maintained periodically by qualified personnel (e.g. qualified Certificate of Fitness holder, etc.). Daily visual inspection of the Fire Command Center has been the industrial practice and is highly recommended by the Fire Department. The purpose of the visual inspection is to detect defective components or abnormalities.

The FDNY recommends that the FLS Director should perform a visual inspection daily. If any problem is found, the FLS Director must have the defects corrected.

(a) **Inspect all exits, stairways, and hallways to determine condition and availability for use.** All exits, stairways, and hallways must be kept free of blockage. Blocking the exit may prevent occupants from leaving the building. Corrections must be made for proper way of exit with doors opening in direction of travel. An exit aisle is generally required to be at least 3 feet wide.

Locks, bolts, and chains must not be installed on the exit doors while the building is in use. If locks are seen they **must** be removed immediately.

(b) **Check all the doors in the affected areas to see operation conditions and availability for use.** Close attention must be paid to the stairways and areas where fire doors are installed. Exit into the stairway must be available from each floor of the building. Usually, a panic bar is installed on the door. The panic bars allows the occupants to quickly exit from the premises in case of an emergency. The FLS Director must ensure that the fire doors exist, and are in good working order.

(c) **Ensure that self-closing doors are not blocked and are closed at all times (when not in use).** The FLS Director must ensure that all self-closing doors are not left open for any reason. Self-closing doors are made to slow down the spread of fire during emergency. These doors must be marked with a sign stating that they are self-closing doors. All self-closing doors in the building must be kept in good working order. They must be checked to make sure that they can be opened and closed freely.

(d) **Ensure that exits are properly labeled, and hallways and stairways are lit.** Emergency lighting must be provided for exits. Directional signs must clearly show the path to exit. Exit signs posted above doors and emergency lighting must be lit.

(e) **The entire location must be checked daily for ignition sources.** Any likely ignition sources that are found must be immediately fixed or removed. For example, arcing or exposed electrical wiring should be reported.

(f) **Smoking is prohibited.** The Smoke Free Air Act of 2002 bans smoking in most workplaces, including bars, restaurants, clubs, offices, and other public areas. The FLS Director must enforce the no smoking rules.

(g) **Constantly inspect premises for buildup of rubbish.** Trash and garbage must not to be allowed to accumulate inside the building. Accumulated trash is a fire hazard. It may be easily ignited by a stray spark. All trash and garbage must be removed from the premises or building owner must be promptly notified.

(h) **Ensure fire extinguishers and fire alarm pull stations are readily available.** All fire extinguishers and pull stations must be clearly visible and easily accessible.

(i) **Hot work operation may be prohibited**. The FLS Director must know that no hot work operation is allowed in areas of a building **where the sprinkler system is impaired**.

The FLS Director must be aware of any change of building system that may impact fire safety.

11.2 Human behavior and personal safety of building occupants

(This section was cited from two journal articles:

Ronchi E. and Nilsson D. (2013), Fire evacuation in high-rise buildings: a review of human behaviour and modelling research. *Fire Science Reviews.* https://link.springer.com/article/10.1186/2193-0414-2-7

Fahy, R. F. and Proulx, G. (2009), *'Panic' and human behaviour in fire*. National Research Council Canada. http://tkolb.net/FireReports/PanicInFire09.pdf)

Ronchi and Nilsson (2013) indicated that the performance of people during a fire in a high-rise building may be associated to the type of buildings:

(1) Office buildings:

From a design perspective, office buildings have generally open floor plans, which limit the possibility of containing the fire within a compartment. Occupants are generally better prepared to evacuate the building since they are typically trained through evacuation drills and they are dressed, alert, and responsible mainly for themselves. Occupants may be more familiar with the elevator egress component if elevator systems are used. Fire systems are generally well-maintained, and may include recorded voice messages and fire alarms. Trained staff with particular responsibilities in a fire may be available on hand to facilitate evacuation.

(2) Residential buildings:

Residential buildings present completely different characteristics from both a design perspective as well as the characteristics of the population involved. Occupants may be asleep, not dressed, etc. (i.e., they are not ready to evacuate, thus causing a long delay in the start of the evacuation). Pre-evacuation times are therefore generally higher than other types of building occupancies. Different reasons may be the cause of long pre-evacuation times. Occupants may be emotionally tied to the structure and its contents leading to potential re-entry behaviors. Occupants may also be more reluctant to leave their own property for the same reason. In addition, information spread is slower due to compartmentation, and social links can delay movement. Occupants in hotels are not familiar with the environment. The population in hotels is in fact transient, causing possible difficulties in adopting the appropriate escape route in the case of fire.

(3) Health care facilities (HCF)

In particular, the population in this type of environment presents different characteristics, involving people with temporary or permanent disabilities and mobility impairments. HCFs may have staff on hand (but number or ratios may depend upon the time of the day), but they also have a higher number of occupants that are not able to perform self rescue activities. The intrinsic characteristics of a high-rise building, i.e. long travel distances for people in the upper floors and vertical evacuations (e.g., the need for multiple elevator trips), demonstrate the importance of an effective egress strategy for this type of population.

Many problems need to be addressed, such as the issues concerning fatigue, way-finding, use of vertical components (e.g. stairs, elevators), etc. These problems may be exacerbated in the case of a significant percentage of people with impairments.

The level of training of the staff becomes therefore another key factor in the evacuation performance of the building. From both an individual and group perspective, little research has been carried out in order to study the evacuation behaviors of vulnerable users, e.g., people with disabilities, elderly, etc., whose behavior may strongly affect the egress performance of a building.

Fahy, Proulx and Aiman (2009) reviewed series case studies in fire or catastrophic events. They indicated individuals in general often use the term 'panic' to describe their own emotional state and as an assessment of

their ability to respond to a problem when they feel stressed, anxious or scared. However, people normally do not behave in an irrational or antisocial manner in fire incidents. The case studies reported that the common elements that tend to lead to panic are: the fire spread at an incredible speed; there are limited known or available exits, and the buildings are overcrowded. This study indicates that **information is the key to a successful building evacuation during an emergency**. It suggests that the building staff should not see the building occupants as a mass of irrational people who need to be controlled. **Withholding information or using coded information among staff to prevent occupants' knowing that there is an emergency can be very harmful.** It is much more constructive, and more likely to lead to a positive outcome by providing the occupants without delay with the information that they need to make the right decisions. **When provide information, people can refine their situation awareness, making them more competent at weighing their options before engaging in proper actions.** If the occupants are not familiar with the building (e.g. hotels, shopping malls, etc.), it is essential that FLS Director and all FLS staff must provide the timely information to support occupants' decision-making.

11.3 Occupants with disabilities and special needs

The FDNY plan must specify the procedures for identifying occupants who require assistance, and the procedures for providing such assistance. The list of occupants who have requested assistance must be prepared and maintained at the Fire Command Center.

In the event of fire/smoke situation, FLS Director should notify the designated personnel to assist the disabled individuals.

11.4 Implementation of fire safety and evacuation procedures

In the event of a fire or smoke condition, the FLS Director must ensure that 911 is called immediately and state the determination of implementing the FDNY plan. If arson (i.e. intentionally damaging the property of another without consent of the owner by intentionally starting a fire or causing an explosion) has occurred or is about to occur, the FLS Director must also call the police (911).

When notifying 911 of a fire or other emergency, the call-taker will need to obtain certain information about the emergency. The nature of the emergency and address are the most critical pieces of information. The operator may also ask what the nearest cross-streets are, and if anyone is in need of medical attention and if so, what are their symptoms. Additionally, if responsible for a very large premises, it is likely that there will be more than one means of entry. Providing information about which entrance would provide the most direct access to the emergency area would be helpful in getting the emergency response personnel to the area of the emergency as quick as possible. The more information the caller has available to communicate to the 911 operator, the quicker the first responders can reach the premises.

When calling 911, in addition to the information mentioned above, the caller should be prepared to answer other 911 operator questions, which may include

- Type of occupancy (e.g. hotel, office building, etc.)
- The phone number the 911 operator can reach the caller
- The nature of the emergency
- Details about the emergency, such as the description of the fire/smoke condition and fire location, if known
- If the FDNY plan has been implemented.

Be prepared to follow any instructions the operator provides. Do not hang up until the operator instructs you to.

11.4.1 Important information in fire emergencies

In the event of fire/smoke condition or the activation of a fire alarm, the FLS Director must

- immediately report to the Fire Command Center
- acknowledge the alarm (if applicable)
- address the alarm panel to verify the location and which initiating device(s) is/are activated:
    - manual pull station
    - smoke, beam, duct detectors
    - heat detectors
    - water-flow device
- ensure all the elevators are recalled
- communicate with FLS staff: contact FLS wardens who are located on the floor(s) with fire alarm activities or direct the FLS brigade members to obtain the following information:
    (1) Location of the fire (floors and areas on floors)
    (2) Severity of the fire/smoke condition
    (3) Floors affected by smoke conditions
    (4) Stairways affected by smoke conditions
    (5) Floors occupied at the time of the fire and the number of building occupants in such areas

These factors must be expeditiously determined and considered in implementing the fire safety and evacuation procedures in the event of a fire in the building. The primary communication must be made verbally. Text or email should not be used as the primary method of communication for fire emergencies.

11.4.2 Implementation procedures

(1) Mobilize FLS brigade members/FLS wardens and other FLS staff

The FLS Director needs to assign the FLS brigade members the following duties:

- Assist in the evacuation/relocation of the floors with fire alarm activities (i.e. the affected floors) to at least 3 floors below from their current floor or consistent with the FDNY plan;
- Control small fires by using fire extinguishers or closing doors (if safe to do so);
- Maintain communication with the FLS Director and follow the FLS Director's instructions;
- Instruct at least one brigade member to report to the floor below the fire to meet the firefighters.

The FLS Director needs to assign the FLS wardens and deputy FLS wardens the following duties:

- Assist in the evacuation/relocation of the floors with fire alarm activities (i.e. the affected floors) to at least 3 floors below their present location or consistent with the FDNY plan;
- Maintain communication with the FLS Director after the relocation/evacuation and follow the FLS Director's instructions.

(2) Identify stairway(s)/stairwell(s) for evacuation/relocation of building occupants and stairway(s) for use by responding firefighting personnel.

If any stairway door is locked, the FLS Director must ensure every door is openable during the fire emergency. For example, ensure all the fail-safe devices have been released. The FLS Director must identify a stairway for firefighting personnel access. He/she must also help maintain a clear path from the lobby to the stairway access.

The FLS Director also must identify the stairway for building occupants to use. Fire tower stairway should be given priority for building occupants to use for evacuation/relocation.

(3) Make announcement(s) to building occupants informing them of the fire condition and its location. Instruct them not to use elevators unless directed to do so by firefighting personnel. The FLS Director must notify the affected floors first including the fire (alarm) floor(s), floor above and floor below the alarm (if applicable), and then inform all the building's occupants of the alarm (by making an "all call announcement").

(4) Instruct building occupants on the fire floor, the floor above, and the floor below (if applicable) the fire floor to immediately leave these floors, and evacuate the building or relocate to another safe location within the building at least three (3) floors below their present location or evacuate the occupants consistent with the FDNY plan. Identify the stairways(s) or other routes of egress for their use and direct them to use only those stairways(s) or routes of egress. Instruct building occupants to close stairway doors behind them.

(5) Building occupants may be instructed to exit the stairway at a designated floor if the stairway is needed for responding firefighting personnel.

(6) Instruct brigade members to assist building occupants with special needs who are unable to use the stairways or other designated route of egress without assistance.

(7) Unless fire and smoke conditions warrant otherwise, instruct building occupants on floors with no fire alarm activities (i.e. unaffected floors) to shelter in place and not move around the building, pending further direction from the FLS Director or firefighting personnel.

(8) Monitor the progress of the fire and smoke conditions by monitoring the fire alarm control panel and maintaining regular communication with FLS staff.

(9) Ensure the HVAC system has been shut down. Consult with the building engineer (if applicable).

11.4.3 Use of Elevators

In the event of fire/smoke condition or the activation of a fire alarm, the FLS Director must ensure that the elevator Phase I operation has been activated automatically or manually.

Elevators must not be used to implement the fire safety and evacuation plan except under the following circumstances:

- Where such use is conducted or authorized by firefighting personnel.
- Where such use is made necessary by fire, heat, or smoke conditions in stairways preventing or hindering the evacuation or in-building relocation of building occupants, and the FLS Director or deputy FLS Director determines that the elevators can be safely used, subject to the following provisions:
    - Elevators which operate in a shaft that does not serve (stop at) the fire floor or have openings on the fire floor may be used. Elevators serving (stopping at) the fire floor or having openings on the fire floor must not be used under any circumstances.

      Note: Very tall high-rise buildings may have blind shafts in which elevators serving upper floors pass man floors without door openings. An example of a blind elevator shaft: there is a hoist-way door on the first floor and not another one until upper floors.

    - Only elevators provided with two-way voice communication to the Fire Command Center in accordance with Building Code requirements may be used for these purposes.

- Movement of elevators must be controlled either by operation in manual mode by an FLS staff member or at the elevator control panel in the lobby, under the direct supervision of the FLS Director.

11.5 Interaction with the Fire Department during fire incidents

The FLS Director, all other FLS staff and building occupants must comply with the orders of FDNY firefighting personnel. The lobby and the building entrance must be kept clear for the FDNY access. When the Fire Department arrives, the FLS Director must remain on the Fire Command Center to greet FDNY firefighting personnel, at least one fire brigade member should be remained on the floor below the fire floor to provide information to FDNY firefighting personnel, and the Building Engineer should be available and prepared to follow FDNY firefighting personnel's instructions.

FLS Director should silence the fire alarm system when authorized by FDNY firefighting personnel. Audible silence allows for easier communication for the FDNY personnel while responding to an alarm.

FLS Director is, required to notify arriving FDNY personnel and other first responders of the nature of the emergency and the actions already taken. FLS Director should also provide the following materials to FDNY firefighting personnel:

- Floor plans
- Building Information Card (BIC)
- FDNY Plan
- Elevator and stair diagrams
- Elevator keys
- Any other master keys/access cards that may be required
- Premises security radios/walkie-talkies

FLS Director, may need to quickly provide FDNY firefighting personnel with the following information, if known:

- Location of the fire or alarm
- The nature of the alarm (what cause the alarm)
- The conditions on the fire floor and floor above (including smoke condition)
- The status of the stairways (stairway being used by occupants and stairway suggested to be used for FDNY firefighting personnel, location of the standpipe risers)
- Evacuation/relocation status
- Status of elevators and HVAC system
- The location of the evacuated/relocated people
- Any problems with the evacuation/relocation
- Number of potential victims at the location
- Any people unaccounted for
- Any problems reported to you
- Any impairment of the fire protection system

It is critical for the FLS staff to follow orders of FDNY firefighting personnel. FDNY firefighting personnel may request assistance of the FLS Director and other FLS staff to operate and control the building systems.

FLS Director required to silence and reset the fire alarm system when he or she are authorized by the Fire Department and the condition has been cleared.

PART II. FIRE SAFETY TRAINING

Chapter 12. CASE STUDY: FIRE EMERGENCIES

This booklet reviews fire incidents that occurred in different occupancies. The instructor must select at least three cases from the five incidents including one office building case, one hotel case and one case from other occupancies (shopping mall, club, or hospital) to have an open discussion and classroom exercise with the students. The FDNY recommends that candidates should also study the other cases in this booklet that the instructor did not discuss. The school graduation exam and/or FDNY computer exam may cover any case study from this booklet. The FDNY provides schools the recommended answers for all discuss questions. Every school should provide these answers to the students after the case discussion session.

12.1 High-rise office building fire

12.1.1 One Meridian Plaza fire, PA (1991)

(Detail discussion should be referred to: U.S. Fire Administration/Technical Report Series, High-Rise Office Building Fire One Meridian Plaza, USFA-TR-049/February 1991, FEMA

https://www.usfa.fema.gov/downloads/pdf/publications/tr-049.pdf**)**

One Meridian Plaza is a 38-floor skyscraper in Philadelphia that suffered a severe fire on February 23, 1991. The fire is one of the most significant high-rise fires in US history. The fire claimed the lives of three Philadelphia firefighters and gutted eight floors of a 38-story fire-resistive building causing an estimated $100 million in direct property loss and an equal or greater loss through business interruption. Litigation resulting from the fire amounts to an estimated $4 billion in civil damage claims.

Delayed Report

The fire started in a vacant 22nd floor office in a pile of linseed oil-soaked rags left by a contractor. At approximately 2023 hours on February 23, 1991, a smoke detector was activated on the 22nd floor of the One Meridian Plaza building. The activated detector is believed to have been located at the entrance to the return air shaft in the northeast corner of the building (Due to incomplete detector coverage, the fire was already well advanced before the detector was activated). At that time, there were three people in the building: an engineer and two security guards. The alarm sounded throughout the building, and elevator cars automatically returned to the lobby. The building engineer investigated the alarm using an elevator on manual control to go to the 22nd floor. The central station monitoring company that served the building reportedly called the guard desk in the lobby to report the alarm. The call came in before the engineer reached the fire floor, and the alarm company was told that the source of the alarm was being investigated. The alarm company did not notify the fire department at that time.

When the elevator doors opened at the 22nd floor, the engineer encountered heavy smoke and heat. Unable to reach the buttons or to leave the elevator car to seek an exit, the building engineer became trapped. He was able to use his portable radio to call the security guard at the lobby desk requesting assistance. Following the trapped engineer's instructions, the security guard in the lobby recalled the elevator to the ground floor. The second security guard monitored the radio transmissions while taking a break on the 30th floor. This guard initially mistook the fire alarm for a security alarm believing that he had activated a tenant's security system while making his rounds. He evacuated the building via the stairs when he heard the building engineer confirm there was a fire on the 22nd floor.

The lobby guard called the alarm-monitoring service to confirm that there was an actual fire in the building when the engineer radioed to her from the 22nd floor but she did not immediately call the fire department.

The first call received by the Philadelphia Fire Department came from a passerby who used a telephone near the building to call 9-1-1. The caller reported smoke coming from a large building but was unable to provide the exact address. While this call was still in progress, at approximately 2027 hours, a call was received from the alarm-monitoring service reporting a fire alarm at One Meridian Plaza.

Electrical Power Failure
The Philadelphia Fire Department initiated its high-rise emergency procedures and began the ascent to the 22nd floor. Shortly after members reached the 11th floor, the building completely lost electrical power. Fire had burned through the electrical cables and plunged the entire building into darkness. The emergency generator should have activated automatically, but it failed to produce electric power. These events left the entire building without electricity for the duration of the incident in spite of several efforts to restore commercial power and to obtain power from the generator. This total power failure had a major impact on the firefighting operations. The lack of lighting made it necessary for firefighters to carry out suppression operations in complete darkness using only battery powered lights. Since there was no power to operate elevators, firefighters were forced to hand carry all suppression equipment up the stairs to the staging area that was established on the 20th floor.

Water Supply problem
Firefighters were unable to get sufficient water pressure from the incorrectly set pressure-reducing valves found on the standpipe outlets. It was not until several hours into the operation that a trained technician who knew how to adjust them arrived at the fire scene.

Firefighting Operations Suspended
All interior firefighting efforts were halted after almost 11 hours of uninterrupted fire in the building. After consulting with a structural engineer about the possibility of collapse and the loss of three firefighters, an order was given to evacuate the building. At this point, the fire was controlled on the 22nd through 24th floors but continued to burn on floors 25 and 26 and extend upward.

Fire Stopped
The fire was stopped when it reached the 30th floor, which was protected by automatic sprinklers. The fire was declared under control 3:01 p.m. (approximately 19 hours after the smoke detector fire alarm), February 24, 1991.

What are the major issues in this One Meridian Plaza fire?

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What could have prevented this fire from becoming catastrophic?

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What should the response of an on-duty FLS Director be when a smoke detector activates?

Refer to Chapter 11 of this booklet. In general, before the FDNY arrives, the FLS Director must perform every necessary step mentioned in Section 11.4 of the booklet. When the FDNY arrives, the FLS Director must assist the FDNY by arranging required pathway, staff, equipment and documents for the FDNY use. The FLS Director also needs to report all required information to the FDNY (refer to Section 11.5 of the booklet). The FLS Director must silence and reset the fire alarm system when authorized by the FDNY.

12.2 **High-rise hotel building fire**

12.2.1 Doubletree Hotel fire, New Orleans, LA (1987)

(This section was cited from: U.S. Fire Administration/Technical Report Series, Doubletree Hotel Fire, USFA-TR-008/July 1987, Homeland Security: https://www.usfa.fema.gov/downloads/pdf/publications/tr-008.pdf)

The hotel is a 17-story high-rise and contains 363 guest rooms. The building is constructed of reinforced concrete and appears to qualify as Type 1 construction: non-combustible/fire-resistive. The fire occurred on a Sunday just after 10:00 p.m. and started in a corridor serving guest rooms on the tenth floor. The floor was unoccupied and undergoing renovation at the time. The cause of the fire was arson. Due to the failure of the automatic fire alarm system, the fire gained significant headway before being detected. It is the most significant factor allowing the fire to become a major incident.

At approximately 10:15 p.m., an elevator alarm began to sound. The building engineer and security guard were dispatched to find the stopped elevator, each taking a portion of the building. During the search, the engineer encountered smoke, so he instructed the building occupants to evacuate. He returned to the lobby to direct the Fire Department. (The Fire Department received its first call from the hotel operator and dispatched first alarm units at 10:32 p.m.)

As the security guard entered the tenth floor, he probably encountered heavy smoke and activated the pull station at Stairway 2. He was eventually discovered collapsed and died at a hospital. At the time of the fire, the tenth floor was unoccupied and undergoing renovation. As part of the renovation process, large wooden cabinets were being provided in each room. Employees who had been installing the cabinets had stored the cardboard boxes and sheets of solid foam, most of which had been flattened and stacked against the wall, in the corridor. An estimated 10 to 20 boxes that were stacked outside Room 1001 were probably burning when the guard entered the tenth floor.

The engineer had since arrived at the lobby and called the chief engineer for the hotel, who instructed him to shut off the air handling units. The engineer attempted to go up the stairway with the firefighters, but was told to go back. Without informing the arriving first responders and carrying proper protective equipment, the engineer boarded an elevator and went to the seventeenth floor to shut off the building's fans. Although the elevator filled with smoke on the way up, he was able to get to the seventeenth floor and access the fan controls. Now trapped by smoke, he called the lobby for help. The chief engineer had arrived and advised him of a means to access a second stairway, which the engineer used to escape.

Some occupants said they failed to evacuate when the fire alarm went off because of a previous series of false alarms. These occupants complained that they were not aware that there was an actual fire until they smelled smoke or were later told to evacuate.

The incident was terminated at 03:17 on Monday morning after nearly 5 hours. Following the fire, the Fire Department issued citations to the hotel for illegal storage in an exit corridor and for failure to properly maintain the fire alarm system.

What are the major issues in this Doubletree Hotel Fire?

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What could have prevented this fire from becoming catastrophic?

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If the building engineer on eleventh floor notify the FLS Director that he spotted smoke, what are the responses that the FLS Director must perform?

Refer to Chapter 11 of this booklet. In general, before the FDNY arrives, the FLS Director must perform every necessary step mentioned in Section 11.4 of the booklet. When the FDNY arrives, the FLS Director must assist the FDNY by arranging required pathway, staff, equipment and documents for the FDNY use. The FLS Director also needs to report all required information to the FDNY (refer to Section 11.5 of the booklet). Before the FDNY leave, the FLS Director must reset the fire alarm system when authorized by the FDNY.

12.2.2 Tropicana Casino Hotel fire, Atlantic City, NJ (1999)

(This section was cited from the following resources:

Fire Engineering Magazine, http://www.fireengineering.com/articles/print/volume-157/issue-6/features/grease-duct-fire-leads-to-stricter-code-enforcement.html ;

https://www.abcofire.com/hood-cleaning-cycle/;

NFPA "Structure Fires in Eating and Drinking Establishments." http://www.nfpa.org/news-and-research/fire-statistics-and-reports/fire-statistics/fires-by-property-type/assemblies/eating-and-drinking-establishments)

On March 31, 1999, the Atlantic City Fire Department was dispatched to a fire in the kitchen of the Tropicana Casino Hotel. The fire was reported in the late evening. The officer reported a fire on the fourth-floor roof of the Tropicana Hotel as the flames were shooting high into the air. The flames were erupting from its restaurant exhaust fan.

The fire began in the Seaside kitchen in an unattended cooking wok full of vegetable oil. The oil heated to its ignition temperature, and flames spread vertically to the hood plenum and grease filters. The fire easily penetrated the filter and spread across the grease-laden interior plenum and proceeded up the exhaust duct to the roof two floors above. The Tropicana Casino Hotel is a fully protected property with automatic sprinkler systems, an automatic fire alarm, and kitchen range-hood fire suppression systems. However, the fire moved so quickly that it did not provide sufficient heat to activate the fire suppression system's fusible link initially. The fusible link was located just past the duct collar outlet on the opposite side of the plenum. The fire extended into the greasy duct and traveled up to the fan housing on the fourth-floor roof.

The fire suppression system finally operated when firefighters placed a hoseline in the roof fan, driving a burst of heat back down at the fusible link. When the heat released the fusible link, the system nozzle above the wok did not operate because it was heavily covered with oil and grease. By the termination of the incident, the Atlantic City Fire Department had used four hoselines from the building standpipe to bring the fire under control.
Fortunately, no one was seriously injured, but the fire caused over $350,000 in damage and several weeks of down-time while extensive repairs were made to the building.

What are the major issues in this Tropicana Casino Hotel fire?

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What could have prevented this fire from becoming catastrophic?

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If the FLS Director in the hotel is notified that there is a fire emergency in the kitchen, what are the responses that the FLS Director must perform?

Refer to Chapter 11 of this booklet. In general, before the FDNY arrives, the FLS Director must perform every necessary step mentioned in Section 11.4 of the booklet. When the FDNY arrives, the FLS Director must assist the FDNY by arranging required pathway, staff, equipment and documents for the FDNY use. The FLS Director also needs to report all required information to the FDNY (refer to Section 11.5 of the booklet). The FLS Director must silence and reset the fire alarm system when authorized by the FDNY.

12.3 Shopping mall fire

12.3.1 Ycuá Bolaños supermarket fire, Asuncion, Paraguay. (2004)

(This section was cited from the following resources:

http://www.sfgate.com/news/article/At-least-256-die-in-Paraguay-blast-fire-2736865.php

http://www.nfpa.org/news-and-research/publications/nfpa-journal/2004/november-december-2004

http://idighardware.com/wordpress/wp-content/uploads/2013/11/NFPA-Deadly-Fires-Handout.pdf)

On August 1st of 2004, a two-story, unsprinklered Paraguayan supermarket and commercial complex, which included a restaurant, offices, and an underground parking garage, caught fire. The two floors of the supermarket had approximately 43,000 square feet of floor area for each floor.

Witnesses said an explosion took place about noon in a basement food-court kitchen where families had gathered for lunch in the modern, mall-sized market. The cause was believed to be a faulty barbecue chimney that leaked hot flammable gases into the ceiling, which ignited. The flames burst through the upper face of the duct, then ignited the foam roof. There was no evidence that the fire alarm system provided the required notification. In fact, none of the witnesses reported having heard the fire alarm system during the fire. The fire alarm system was not monitored by a central station at the time of the fire, even though the panel was capable of communicating to a central station.

The fast growing fire caused the 1st floor to collapse. Firefighters had to knock holes in walls of neighboring houses to access the supermarket. The fire burned for seven hours before firefighters were able to extinguish it.

The exit doors did not swing outward. In addition, a security guard tried to prevent customers from leaving the building by closing the doors, allegedly to keep people from leaving without paying. The gate separating the ramp for the supermarket carts from the parking area is also closed. This action blocked people trying to flee the fire.

This fire killed more than 300 people and injured nearly 500 people.

What are the major issues in this Ycuá Bolaños supermarket fire?

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What could have prevented this fire from becoming catastrophic?

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If the FLS Director is informed that there is a fire spreading out from the food-court of the supermarket, what are the responses that the FLS Director must perform?

Refer to Chapter 11 of this booklet. In general, before the FDNY arrives, the FLS Director must perform every necessary step mentioned in Section 11.4 of the booklet. When the FDNY arrives, the FLS Director must assist the FDNY by arranging required pathway, staff, equipment and documents for the FDNY use. The FLS Director also needs to report all required information to the FDNY (refer to Section 11.5 of the booklet). Before the FDNY leave, the FLS Director must reset the fire alarm system when authorized by the FDNY.

12.4 **Club fire**

12.4.1 Station Nightclub fire, West Warwick, RI. (2003)

(This section was cited from**:** NIST NCSTAR 2: Vol. I, Report of the Technical Investigation of The Station Nightclub Fire, NIST, U.S. Department of Commerce: http://fire.nist.gov/bfrlpubs/fire05/PDF/f05032.pdf**)**

A fire occurred on the night of Feb. 20, 2003, in The Station nightclub, at West Warwick, Rhode Island. A band that was on the platform that night, during its performance, used pyrotechnics that ignited polyurethane foam insulation lining the walls and ceiling of the platform. The fire spread quickly along the walls and ceiling area over the dance floor. Smoke was visible in the exit doorways in a little more than one minute, and flames were observed breaking through a portion of the roof in less than five minutes. Egress from the nightclub, which was not equipped with sprinklers, was hampered by crowding at the main entrance to the building. More than two-thirds of the 462 people in attendance were either killed or injured (100 dead, 230 injured).

What are the major issues in the Station Nightclub fire?

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What could have prevented this fire from becoming catastrophic?

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What should the response of an on-duty FLS Director be when there is a fire occurring in a public assembly area of his/her premises?

Refer to Chapter 11 of this booklet. In general, before the FDNY arrives, the FLS Director must perform every necessary step mentioned in Section 11.4 of the booklet. When the FDNY arrives, the FLS Director must assist the FDNY by arranging required pathway, staff, equipment and documents for the FDNY use. The FLS Director also needs to report all required information to the FDNY (refer to Section 11.5 of the booklet). Before the FDNY leave, the FLS Director must reset the fire alarm system when authorized by the FDNY.

12.5 **Hospital fire**

12.5.1 Southside Regional Medical Center fire, Petersburg, VA. (1994)

(This section was cited from: U.S. Fire Administration/Technical Report Series, Hospital Fire Kills Four Patients Southside Regional Medical Center, Petersburg, Virginia, USFA-TR-080/December 1994. https://www.usfa.fema.gov/downloads/pdf/publications/tr-080.pdf)

On December 31, 1994, a New Year's Eve fire at the Southside Regional Medical Center (SRMC) in Petersburg, Virginia, killed four patients and injured three firefighters and several nurses. The fire was the worst in terms of number of lives lost in a single incident in Petersburg.

The fire originated in a patient room on the fourth floor of the hospital shortly after 9 p.m. Local investigators believe that smoking materials were involved in the ignition and that the fire resulted from the patient's actions. They could not determine if the actions which caused the fire were accidental or intentional. Foam plastic padding in the mattress fueled the fire further. A nurse discovered the fire but was unable to extinguish it. She called for help and pulled the fire alarm but was unable to rescue the patient. She did not close the door to the room of origin which allowed smoke to fill the corridor very quickly.

Within a few minutes after discovery of the fire, smoke conditions became very bad. Three patients in rooms adjacent to the fire room died from smoke inhalation, and one patient in the fire room died from a combination of smoke inhalation and burns.

At some point during the fire, the oxygen regulator on the wall in the room of origin melted and may have released a flow of 100 percent oxygen into the room for a short period until it was shut off. A maintenance worker shut off the central oxygen valve in the elevator lobby area approximately three to five minutes after the alarm sounded, but before the fire department arrived on the fourth floor.

The fire was reported to the Petersburg 9-1-1 Communications Center by several different sources almost simultaneously at 21:11**.** Twelve minutes after dispatch of the call, and only nine minutes after the fire department's arrival on the scene, they were able to gain control of the fire very quickly.

What are the major issues in this hospital fire?

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What could have prevented this fire from becoming catastrophic?

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When the FLS Director is notified by the manual pull station alarm, what are the responses that the FLS Director must perform?

Refer to Chapter 11 of this booklet. In general, before the FDNY arrives, the FLS Director must perform every necessary step mentioned in Section 11.4 of the booklet. When the FDNY arrives, the FLS Director must assist the FDNY by arranging required pathway, staff, equipment and documents for the FDNY use. The FLS Director also needs to report all required information to the FDNY (refer to Section 11.5 of the booklet). Before the FDNY leave, the FLS Director must reset the fire alarm system when authorized by the FDNY.

Appendix A: Reference Material

<u>These Reference Guide will be given to you by the FDNY examiners when taking the FLS Director Computer Test at the Fire Department.</u>

Certificate of Fitness/Certificate of Qualification List

Type	Description	Personal/General	Premises Related or Citywide
B-29	Supervision of Battery Systems	General	Premises related
F-01	Citywide Fire Guard for Impairment	Personal	Citywide
F-07/W-07	Fire and Non-Fire Emergency Drill Conductor	Personal	F-07: Premises related W-07: Citywide
F-60	Fire guard for torch operation and fire guard for construction site.	Personal	Citywide
F-89	Fire and Life Safety Director	Personal	Premises related
G-60	Torch operation	Personal	Citywide
P-64/F-64 /W-64	Commercial Kitchen Exhaust System Cleaning Technician	Personal	P-64/W-64: Citywide F-64: Premises related
Q-01/Q-99	Refrigeration system operating engineers	Personal	Premises related
S-12	Citywide Sprinkler System	Personal	Citywide
S-13	Standpipe System (except multi-zone system)	Personal	Citywide
S-14	Standpipe System, multi-zone	Personal	Premises related
S-78/F-78	Inspection, Cleaning & Testing Of Smoke Detectors	Personal	S-78: Citywide F-78: Premises related
S-95	Supervision Of Fire Alarm Systems	Personal	Premises related
S-97/S-98	Inspection, Testing and Servicing of Fire Alarm Systems	Personal	Citywide
T-89	Temporary Fire and Life Safety Director	Personal	Premises related
W-97	Fumigation and insecticidal fogging operation	Personal	Citywide
W-96	Portable Fire Extinguisher Servicing	Personal	Citywide

Duration and Frequency of FLS Staff Training

The Fire Department recommends that the FLS staff participate in the training designed to familiarize them with their duties pursuant to the plan in accordance with the frequency set below:

FLS staff member	Initial training duration		Refresher training duration and frequency	
	Fire safety	Non-fire emergency	Fire safety	Non-fire emergency
Deputy FLS Directors	Require FLS Director C of F	Require FLS Director C of F	• 1 hour quarterly for Group A; • 1 hour quarterly for Group R-1 (per shift); • 1 hour annually for all other occupancies	1 hour semiannually
FLS building evacuation supervisor	2 hours	3 hours		1 hour semiannually
FLS wardens and deputy wardens	1 hour	2 hours		1 hour annually
FLS brigade members	1 hour	2 hours		1 hour annually
All other FLS staff	1 hour	2 hours		1 hour annually

Fire alarm system

Certificate of Fitness for fire alarm system

	Duties can be performed by C of F Holders	May be performed by	
		S-95/F-89/T-89	S-97/S-98
1.	Daily visual inspections of fire alarm system	Yes	Yes
2.	Maintain the fire alarm log book	Yes	Yes
3.	Program, service, clean, test, repair and/or replace any fire alarm system components	No	Yes

Certificate of Fitness for smoke detector cleaning and testing

	Duties can be performed by C of F Holders	May be performed by		
		S-95/F-89/T-89	S-78/ F-78	S-97/S-98
1.	Smoke detector visual inspection	Yes	Yes	Yes
2.	Smoke detector inspection, testing and cleaning	No	Yes	Yes
3.	Smoke detector maintenance	No	Yes	Yes
3.	Program, service, clean, test, repair and/or replace fire alarm components	No	No	Yes

Visual Inspection and Testing Frequencies of Fire Alarm Systems

1. Visual inspection frequencies of each fire alarm component
Components
Weekly
Control equipment: fire alarm systems UNMONITORED for alarm, supervisory and trouble signals (including fuses, interfaced equipment, lamps and LEDs, primary (main) power supply)
Monthly
Batteries: Lead-acid
Batteries: Primary (dry cell)
Quarterly
Initiating devices: Radiant energy fire detectors
Initiating devices: Supervisory signal devices
Initiating devices: Waterflow devices
Semiannually
Batteries: Nickel-cadmium
Batteries: Sealed lead-acid
Fire alarm control unit trouble signals
In-building fire emergency voice/alarm communications equipment
Remote annunciators
Initiating devices:
- Air sampling
- Duct detectors
- Electromechanical releasing
- Fire extinguishing system(s) or suppression system(s) switches

1. Visual inspection frequencies of each fire alarm component
Components
- Manual fire alarm boxes
- Heat detectors
- Smoke detectors (excluding one- and two-family dwellings)
Supervising Station Fire Alarm Systems
- Transmitters: DACT
- Transmitters: DART
- Transmitters: McCulloh
- Transmitters: RAT
Special procedures
Public emergency alarm reporting system transmission equipment
-Publicly accessible alarm box
-Master box- manual operation
Mass notification system, NON-SUPERVISED systems installed prior to adoption of the NFPA 72, 2010 edition
-Control equipment: Fuses
-Control equipment: Interfaces
-Control equipment: Lamp/LED
-Control equipment: Primary (main) power supply
-Secondary power batteries: Lead-acid
-Secondary power batteries: Nickel-cadmium
-Secondary power batteries: Primary (dry-cell)
-Secondary power batteries: Sealed lead-acid
-Initiating devices
-Notification appliances
Guard's tour equipment
Semiannually
Combination systems : Fire extinguisher electronic monitoring device/systems
Combination systems: Carbon monoxide detectors/systems
Interface equipment
Alarm notification appliances-supervised
Exit marking audible notification appliances
Annually
Control equipment: fire alarm systems MONITORED for alarm, supervisory, and trouble signals (including fuses, interfaced equipment, lamps and LEDs, primary (main) power supply)
Fiber-optic cable connections
Public emergency alarm reporting system transmission equipment
-Auxiliary box
-Master box- auxiliary operation
Mass notification system, SUPERVISED
-Control equipment: Fuses
-Control equipment: Interfaces
-Control equipment: Lamp/LED
-Control equipment: Primary (main) power supply
-Secondary power batteries: Lead-acid
-Secondary power batteries: Nickel-cadmium
-Secondary power batteries: Primary (dry-cell)

1. Visual inspection frequencies of each fire alarm component
Components
-Secondary power batteries: Sealed lead-acid
-Initiating devices
-Notification appliances
Mass notification system: Antenna
Mass notification system: Transceivers

2. Test frequencies of each fire alarm components
Components
Daily
Public emergency alarm reporting systems: Power supply: Wired system-voltage tests
Weekly
Public emergency alarm reporting systems: Engine-driven generator
Monthly
Batteries-fire alarm systems: Primary type (dry cell)-Age test
Quarterly
Control equipment: building systems NOT connected to a supervising station (including Functions, fuses, interfaced equipment, lamps and LEDs, primary (main) power supply, and transponders)
Public emergency alarm reporting systems: Power supply
-Lead-acid type batteries- Discharge test(2 hours)
-Lead-acid type batteries- Load voltage test
-Nickel-cadmium type batteries- Load voltage test
-Sealed lead-acid type batteries- Load voltage test
Initiating devices: Supervisory signal devices
Pressure supervisory indicating devices
-Water level supervisory indicating devices
-Water temperature supervisory indicating devices
-Room temperature supervisory indicating devices
-Other suppression system supervisory indicating devices
Semiannually
Batteries-fire alarm systems:
- Lead-acid type- Discharge test (30 minutes)
- Lead-acid type- Load voltage test
- Lead-acid type- Specific gravity
- Nickel-cadmium type- Load voltage test
- Sealed lead-acid type- Load voltage test
Public emergency alarm reporting systems: Power supply: Lead-acid type batteries- Specific gravity
Initiating devices:
- Radiant energy fire detectors
- Supervisory signal devices: Valve supervisory switches
- Waterflow devices
Public emergency alarm reporting system transmission equipment:
- Public accessible alarm box
- Master box-manual operation

2. Test frequencies of each fire alarm components
Components
Mass notification system, NON-SUPERVISED systems installed prior to adoption of the NFPA 72, 2010 edition
-Control unit functions and no diagnostic failures are indicated
-Audible/visible functional test
-Secondary power
-Verify content of prerecorded messages
-Verify activation of correct prerecorded message based on a selected event
-Verify activation of correct prerecorded message based on a targeted event
-Verify control unit security mechanism is functional
Annually
Control equipment: building systems connected to a supervising station (including Functions, fuses, interfaced equipment, lamps and LEDs, primary (main) power supply, and transponders)
Batteries- Fire alarm systems:
- Lead-acid type- Charger test (replace battery as needed)
- Nickel-cadmium type- Charger test (replace battery as needed)
- Nickel-cadmium type- Discharge test (30 minutes)
- Sealed lead-acid type- Charger test (replace battery within 5 years after manufacture or more frequently as needed)
- Sealed lead-acid type- Discharge test (30 minutes)
Public emergency alarm reporting systems: Power supply
-Lead-acid type batteries-Charger test (replace battery as needed)
-Nickel-cadmium type batteries-Charger test (replace battery as needed)
-Nickel-cadmium type batteries-Discharge test (2 hours)
-Sealed lead-acid type batteries-Charger test (replace battery within 5 years after manufacture or more frequently if needed)
-Sealed lead-acid type batteries-Discharge test (2 hours)
Fiber-optic cable power
Control unit trouble signals
In-building fire emergency voice/alarm communications equipment
Remote annunciators
Initiating devices:
- Duct detectors
- Electromechanical releasing
- Fire extinguishing system(s) or suppression system(s) switches
- Fire-gas and other detectors
- Manual fire alarm boxes
- Heat detectors
- System smoke detectors- functional test
- Single- and multiple- station heat alarms
- Single- and multiple- station smoke alarms (in other than one- and two-family dwellings)
- Other supervisory initiating devices
Guard's tour equipment

2. Test frequencies of each fire alarm components
Components
Combination systems: Fire extinguisher electronic monitoring device/ systems
Combination systems: Carbon monoxide detectors/systems
Interface equipment and emergency control functions (i.e., fan control, smoke damper operation, elevator recall, elevator power shutdown, door holder release, shutter release, fail-safe system, etc.)
Special hazard equipment
Alarm notification appliances:
- Audible devices
- Audible textual notification appliances
- Visible devices
Exit marking notification appliances
Public emergency alarm reporting system transmission equipment:
- Auxiliary box
- Master box-Auxiliary operation
Supervising station alarm systems-transmitters
Annually
Special procedures
Mass notification system- protected premises, SUPERVISED
Control unit functions and no diagnostic failures are indicated
Audible/visible functional test
Secondary power
Verify content of prerecorded messages
Verify activation of correct prerecorded message based on a selected event
Verify activation of correct prerecorded message based on a targeted event
Verify control unit security mechanism is functional
Mass notification system- wide-area
Control unit functions and no diagnostic failures are indicated
Control unit reset
Control unit security
Audible/visible functional test
Software backup
Secondary power
Antenna
Transceivers
Verify content of prerecorded messages
Verify activation of correct prerecorded message based on a selected event
Verify activation of correct prerecorded message based on a targeted event
Verify control unit security mechanism is functional

Smoke detectors

All smoke detectors connected to a defined fire alarm system must be

a. **cleaned** at least once every 6 months, except for analog (intelligent) smoke detectors, which must be cleaned no later than one week from receipt of an indication of the need for cleaning.
b. tested for smoke entry at least once a year.
c. tested for sensitivity at least once a year, except for analog (intelligent) smoke detectors, which must be tested for sensitivity no later than one week from receipt of an indication of the need for such testing.

Sprinkler systems

Spare sprinkler heads

A stock of spare sprinklers (not less than 6) must be kept on the premise where the temperature does not exceed 100 Degrees F and must include all types and ratings installed in the protected facility and provided as follows:

1-**300** sprinklers **six**.

301 - **1000** sprinklers **twelve**.

Over **1000** sprinklers **twenty-four**.

Individuals authorized to perform tasks

There are certain periodic visual inspections, maintenance, and tests required by the Fire Code that the S-12/S-15 Certificate of Fitness holder may perform, and some that they cannot without additional qualifications (refer to S-12/S-15 FDNY Certificate of Fitness booklet). The table below provides details of the qualifications required for individuals perform various tasks:

	Holding S-12/S-15 only	Q-01 holding S-12/S-15	Master Plumber holding S-12/S-15	Master Fire Suppression Piping Contractor holding S-12/S-15
Visual inspections	Yes	Yes	Yes	Yes
Perform limited maintenance and test of sprinkler system components (refer to the S-12/S-15 booklet for the detail)	No	Yes	Yes	Yes
Test, maintain and repair/replace all sprinkler systems components, but limited to residential occupancies 30 sprinkler heads or less without a booster pump.	No	No	Yes	Yes
Test, maintain and repair/replace all sprinkler systems components	No	No	No	Yes

The FLS Directors with S-12/S-15 C of F are only authorized to conduct visual inspections of a standpipe system.

Test Frequency of Sprinkler Systems

C of F	**Certificate of Fitness for (S-12) or (S-15).**
Engineer	**Refrigeration Operating Engineer (Q-01 or Q-99), NYC High Pressure Operating Engineer, NYS High Pressure Operating Engineer with S-12 C of F (For employees of a single or multiple properties under common ownership employed by the same building owner/management company)**
MFSPC	**Master Fire Suppression Piping Contractor License (A or B) with S-12 or S-15 C of F.**
MP	**Master Plumber License (MP) with S-12 or S-15 C of F.**

[1] Limited to residential occupancies 30 sprinkler heads or less without booster pump.

[2] S-95 Supervision for Fire alarm Systems & other related systems.

[3] Record must be maintained to be checked annually.

[4] Must be performed once annually by licensed contractor.

*** Foam-Water Sprinkler Systems ONLY.**

**** Water Spray Fixed Systems ONLY.**

Test frequency requirements for sprinkler system components

Components		May be performed by			
		C of F	Engineer	MFSPC	MP[1]
A. Sprinkler Systems					
QUARTERLY (4)					
Alarm Devices	water motor gong	No	Yes	Yes	Yes[1]
Water Spray system test**		No	No	Yes	Yes
SEMIANNUALLY (2)					
Alarm Devices (Vane type water flow devices)		No	Yes	Yes	Yes[1]
Pressure Switch Type		No	Yes	Yes	Yes[1]
ANNUALLY (1)					
Antifreeze solution		No	No	Yes	Yes[1]
Flushing**		No	No	Yes	Yes
Complete foam-water system(s)*		No	No	Yes	Yes
Foam-water solution*		No	No	Yes	Yes
5 YEARS					
Gauges - Remove & send for calibration test or replace asrequired		No	Yes[3]	Yes	Yes[1]
Sprinklers - Remove send for extra high temperature test andreplace as required		No	No	Yes	Yes[1]
10 years & every 10 yrs. thereafter					
Sprinklers - Dry type		No	No	Yes	Yes[1]
20 years & every 10 yrs. thereafter					
Sprinklers – fast response and residential		No	No	Yes	Yes[1]
50 years & every 10 years after					
Sprinklers (Standard Response)		No	No	Yes	Yes[1]
B. Fire, Booster and Special Service Pumps					
WEEKLY (52)					
Pump operation - No-flow condition		No	Yes	Yes	Yes[1]
Diesel Engine system	tank float switch	No	Yes	Yes	Yes[1]
	Solenoids valve operation				

MONTHLY (1)						
Fire pump – Electric pump (minimum of 10 minutes)			**No**	**Yes**	**Yes**	**Yes[1]**
Electrical system[2]	Isolating switch & circuit breaker		**No**	**Yes[3]**	**Yes**	**Yes[1]**
Battery system	Specific gravity or state of charge					
SEMIANNUALLY (2)						
Electrical system[2]	Operating manual starting means (electrical)		**No**	**Yes[3]**	**Yes**	**Yes[1]**
Diesel Engine System	Cooling system	Antifreeze protection level	**No**	**Yes[3]**	**Yes**	**Yes[1]**
	Fuel	Tank float switch				
		Solenoids valve operation				
	Electrical system	Operation of safeties and alarms				
ANNUALLY (1)						
Pump operation - Flow condition			**No**	**No**	**Yes**	**No**
Electrical system[2]	Trip circuit breaker (if mechanism provided)		**No**	**No**	**Yes**	**No**
	Operate emergency manual starting means (without power)					
Exhaust system	Excessive back pressure		**No**	**No**	**Yes**	**No**
Diesel Engine System	Tank vents and overflow piping unobstructed		**No**	**No**	**Yes**	**No**
C. Water Storage Tank						
MONTHLY (12)						
Temperature alarms (cold weather)			**No**	**Yes[4]**	**Yes**	**Yes[1]**
High temperature limit switches (cold weather)			**No**	**Yes[4]**	**Yes**	**Yes[1]**
SEMIANNUALLY (2)						
Water level alarms			**No**	**Yes[4]**	**Yes**	**Yes[1]**
5 YEARS						
Level indicators			**No**	**No**	**Yes**	**Yes[1]**
Pressure gauges			**No**	**No**	**Yes**	**Yes[1]**
D. Valve and Valve Component						
QUARTERLY (4)						
Main drain (sole water supply is through a backflow preventer and/or pressure reducing valves)			**No**	**Yes[4]**	**Yes**	**Yes[1]**
Water-Flow Alarms (pertaining to dry valves, pre-action, and deluge valves)			**No**	**Yes[4]**	**Yes**	**Yes[1]**
Foam concentrate strainer(s)*			**No**	**No**	**Yes**	**Yes**
Pre-action and deluge valves	Priming water		**No**	**Yes[4]**	**Yes**	**Yes[1]**
	Low/high air pressure alarm					
Dry pipe valves and Quick Opening devices	Priming water		**No**	**Yes[4]**	**Yes**	**Yes[1]**
	Low/high air pressure alarm					
	Quick-opening devices					
SEMIANNUALLY (2)						
Control Valves Tamper Switch	Supervisory Alarm		**No**	**Yes[4]**	**Yes**	**Yes[1]**
Water flow alarms	Vane-type and pressure Switch-type water-flow devices		**No**	**Yes[4]**	**Yes**	**Yes[1]**
ANNUALLY (1)						
Main drain			**No**	**No**	**Yes**	**Yes[1]**
Preaction and deluge valves	Full flow		**No**	**No**	**Yes**	**Yes[1]**
Dry pipe valves and Quick Opening devices	Trip test		**No**	**No**	**Yes**	**Yes[1]**
Control Valves	Position		**No**	**No**	**Yes**	**Yes[1]**
	Operation					
Pressure reducing and Relief valves	Circulation relief		**No**	**No**	**Yes**	**Yes[1]**
	Pressure relief valves					
Backflow prevention Assemblies/Forward flow test			**No**	**No**	**Yes**	**Yes[1]**
Proportioning system(s)-all*			**No**	**No**	**Yes**	**Yes**

Manual actuation device(s)*		**No**	**No**	**Yes**	**Yes**
Backflow preventer(s)*		**No**	**No**	**Yes**	**Yes**
3 YEARS					
Dry pipe valves and quick opening devices	Full flow trip test	**No**	**No**	**Yes**	**Yes[1]**
Pre-action systems	For air leakage	**No**	**No**	**Yes**	**Yes**
5 YEARS					
Hydrostatic Test		**No**	**No**	**Yes**	**Yes**
Pressure reducing & Relief valves	Sprinkler systems Hose connections Hose racks	**No**	**No**	**Yes**	**Yes[1]**

Standpipe systems

Individuals authorized to perform tasks

A multi-zone standpipe system must be continuously under the supervision of an S-14 Certificate of Fitness holder. In other words, if your building has multi-zone standpipe system, there must be at least one S-14 C of F holder that could be continuously supervising this system.

The FLS Directors with S-13/S-14 C of F are only authorized to conduct visual inspections of a standpipe system.

The sole FLS Director (without holding an S-13/S-14 C of F) C of F is not authorized to conduct required inspections of a standpipe system; however, the FLS Director must ensure that the standpipe systems are inspected, test and maintained as required frequency by the proper C of F or license holder.

The S-13/S-14 C of F holders with different qualifications are permitted to carry different level of responsibilities in inspecting, testing and maintaining the standpipe systems:

Standpipe system (without multi-zone)	**Holding S-13 only**	**Q-01 holding S-13**	**Master Plumber holding S-13**	**Master Fire Suppression Piping Contractor holding S-13**
Visual inspections	Yes	Yes	Yes	Yes
Perform limited maintenance and test of standpipe system components (refer to the S-13/S-14 booklet for detail)	No	Yes	Yes	Yes
Test, maintain and repair/replace all standpipe systems that are NOT combined with sprinkler systems	No	No	Yes	Yes
Test, maintain and repair/replace all standpipe systems components that are combined with sprinkler systems	No	No	No	Yes

Multi-zone standpipe system	**Holding S-14 only**	**Q-01 holding S-14**
Visual inspections	Yes	Yes
Perform limited maintenance and test of standpipe system components (refer to the S-13/S-14 booklet for detail)	No	Yes
Test, maintain and repair/replace all standpipe systems that are NOT combined with sprinkler systems	No	No
Test, maintain and repair/replace all standpipe systems components that are combined with sprinkler systems	No	No

Test Frequency of Standpipe Systems

C of F	**Certificate of Fitness S-13 City Wide Standpipe System.**
Engineer	**Refrigeration Operating Engineer (Q-01 & Q-99), NYC High Pressure Operating Engineer, NYS High Pressure Operating Engineer with S-13 C of F (For employees of a single or multiple properties under common ownership employed by the same building owner/management company)**
MFSPC	**Master Fire Suppression Piping Contractor License (A or B) with S-13 C of F.**
MP	**Master Plumber License (MP) with S-13 C of F.**

[1] Must have an S-12 or S-15 Certificate.
[2] S-95 Supervision for Fire Alarm Systems & other related systems.
[3] Follow testing requirement.
[4] Record must be maintained to be checked annually.
[5] Must be performed once annually by licensed contractor.

Test frequency requirements for standpipe system components

Components			May be performed by			
			C of F	Engineer	MFSPC	MP
Frequency						
A. Standpipe Systems						
QUARTERLY (4)						
Alarm Devices	Water flow alarms		**Yes**	**Yes**	**Yes**	**Yes**
	Supervisory devices		**Yes**	**Yes**	**Yes**	**Yes**
SEMIANNUALLY (2)						
Alarm Devices (Vane Type and Pressure Type water flow devices)			**Yes**	**Yes**	**Yes**	**Yes**
5 YEARS						
Gauges - Remove and send for calibration test or replace as required			**No**	**Yes[4]**	**Yes**	**Yes**
B. Fire, Booster and Special Service Pumps						
WEEKLY (52)						
Diesel Pump operation - No-flow condition			**No**	**Yes**	**Yes**	**Yes**
Diesel Engine system	Solenoids valve operation		**No**	**Yes**	**Yes**	**Yes**
	Fuel	Tank float switch				
		Solenoids valve operation				
MONTHLY (1)						
Electric Fire pump - (minimum of 10 minutes)			**No**	**Yes**	**Yes**	**Yes**
Electrical system [2]	Isolating switch & circuit breaker		**No**	**Yes**	**Yes**	**Yes**
Battery system	Specific gravity or state of charge					
B. Fire, Booster and Special Service Pumps						
SEMIANNUALLY (2)						
Electrical system [2]	Operate manual starting means (electrical)		**No**	**Yes[4]**	**Yes**	**Yes**
Diesel Engine System	Cooling system	Antifreeze protection level	**No**	**Yes**	**Yes**	**Yes**
	Electrical system	Operation of safeties and alarms				
ANNUALLY (1)						
Pump operation - Flow condition			**No**	**No**	**Yes**	**Yes**
Electrical system [2]	Trip circuit breaker (if mechanism provided)		**No**	**No**	**Yes**	**Yes**
	Operate emergency manual starting means (without power)					

Exhaust system	Excessive back pressure	**No**	**No**	**Yes**	**Yes**
Diesel Engine System	Tank vents and overflow piping unobstructed	**No**	**No**	**Yes**	**Yes**
C. Water Storage Tank					
MONTHLY (12)					
Temperature alarms (cold weather)		**No**	**Yes[5]**	**Yes**	**Yes**
High temperature limit switches (whenever the heating system is in service)		**No**	**Yes[5]**	**Yes**	**Yes**
SEMIANNUALLY (2)					
Water level alarms		**No**	**Yes[5]**	**Yes**	**Yes**
5 YEARS					
Level indicators		**No**	**Yes[5]**	**Yes**	**Yes**
Pressure gauges		**No**	**Yes[5]**	**Yes**	**Yes**
D. Valve and Valve Component					
QUARTERLY (4)					
Main drain (where the sole water supply is through a backflow preventer and/or pressure reducing valves)		**No**	**Yes**	**Yes**	**Yes[1]**
Dry pipe valves and quick opening devices	Priming water Low air pressure alarm Quick-opening devices	**No**	**Yes[5]**	**Yes**	**Yes**
SEMIANNUALLY (2)					
Control Valves Tamper Switch	Supervisory Alarm	**No**	**Yes[5]**	**Yes**	**Yes**
ANNUALLY (1)					
Hose Nozzle (NFPA 1962)		**No**	**No**	**Yes**	**Yes**
Hose Storage device, racks (NFPA 1962)		**No**	**No**	**Yes**	**Yes**
Standpipe – hose valve (Class I and Class III)		**No**	**Yes**	**Yes**	**Yes**
Main drain		**No**	**No**	**Yes**	**Yes[1]**
D. Valve and Valve Component					
ANNUALLY (1)					
Dry pipe valves and Quick opening devices	Trip test	**No**	**No**	**Yes**	**Yes**
Control Valves	Position Operation	**No**	**No**	**Yes**	**Yes**
Pressure reducing and Relief valves	Circulation relief Pressure relief valves	**No**	**No**	**Yes**	**Yes**
Backflow prevention Assemblies		**No**	**No**	**Yes**	**Yes**
3 YEARS					
Hose 1962		**No**	**Yes**	**Yes**	**Yes**
Dry pipe valves and quick opening devices	Full flow trip test	**No**	**No**	**Yes**	**Yes**
Pressure reducing valve flow test		**No**	**No**	**Yes**	**Yes**
5 YEARS					
Hose		**No**	**Yes**	**Yes**	**Yes**
Hydrostatic Test		**No**	**No**	**Yes**	**Yes**
Standpipe system full flow test		**No**	**No**	**Yes**	**Yes**
Gauges - Remove and send for calibration test or replace as required		**No**	**Yes[4]**	**Yes**	**Yes**

Non-water fire extinguishing systems summary table

Systems	Commonly found in/with	Monthly visual inspection	Test, service and maintenance	
			Qualified personnel	Minimum frequency requirement
Dry chemical fire extinguishing systems	flammable liquid storage rooms and at motor fuel dispensing areas.	required	A licensed master fire suppression piping contractor properly trained and having knowledge of the installation, operation and maintenance of the specific system.	semiannual
Wet chemical fire extinguishing systems	commercial cooking system	required		semiannual
Foam systems	commercial cooking system	required to be conducted by a S-15 COF holder		annual
Carbon dioxide fire extinguishing system	flammable liquid storage rooms and at motor fuel dispensing areas.	required		semiannual
Clean agent fire extinguishing systems	IT systems, data storage rooms and manufacturing equipment, or irreplaceable items	required		semiannual
Halon fire extinguishing systems		required		semiannual
Water mist fire extinguishing systems	computer rooms or other energized electrical equipment areas	required		annual

Smoke control system

Inspection, Maintenance and Testing

Fire Code requires that smoke control systems be maintained in good working order. It requires a written maintenance program, including periodic inspection and testing, to be established and implemented immediately upon installation of the smoke control system. Operational testing of the smoke control system must include all of the system's components including initiating devices, fans, dampers, controls, doors and windows.

Frequency

- Dedicated smoke control systems:
  - must be tested semiannually
- Non-dedicated smoke control systems:
  - must be tested annually.
- Post –fire smoke purge systems:
  - must be tested periodically
  - periodic inspection
  - maintained according to manufacturers' recommendations.

Emergency power System

Individuals authorized to perform tasks

Fire Code requires that the inspection, testing and other maintenance of emergency power systems be conducted under the supervision of a person having one of the following qualifications:

- A person holding a Certificate of Fitness as a Fire and Life Safety Director.
- A person holding a Q-01 Certificate of Qualification.
- An electrician licensed by the Department of Buildings.
- An electrician holding a special license issued by the Department of Buildings.
- A person holding a stationary engineer license, or high-pressure boiler operating engineer's license, issued by the Department of Buildings.
- A registered design professional.

Periodic inspection and testing requirements

NFPA Standard 110

Chapter 8 of NFPA Standard 110 includes requirements for the periodic inspection, testing and other maintenance of emergency power systems supplied by emergency generators. Emergency power systems subject to compliance with the requirements of NFPA Standard 110, as modified by FC Appendix B must be maintained as follows:

- Storage batteries, including electrolyte levels or battery voltage, must be inspected weekly and maintained in full compliance with the manufacturer's specifications. Lead- acid batteries must include the monthly testing and recording of electrolyte specific gravity.
- Emergency power systems, including all related components, must be inspected weekly and exercised under load monthly.
- Emergency generator sets must be tested monthly for a minimum of 30 minutes under operating temperature conditions and at not less than 30 percent of the emergency power system nameplate kilowatt rating, or under loading that maintains the minimum exhaust gas temperatures as recommended by the manufacturer. Instructions must be provided for safe manual transfer in the event automatic transfer switches malfunction.
- Diesel-powered emergency power system installations that do not meet the requirements of generator set monthly exercise as noted above must be tested monthly with the available emergency power system load and exercised annually with supplemental loads at 25 percent of nameplate rating for 30 minutes, followed by 50 percent of nameplate rating for 30 minutes, followed by 75 percent of nameplate rating for 60 minutes, for a total of 2 continuous hours.
- Transfer switches must be tested semiannually. The semiannually test of a transfer switch must consist of electrically operating the transfer switch from the standard position to the alternate position and then returning back to the standard position.
- Level 1 emergency power systems must be tested every 3 years for at least 4 hours under its running load. A full facility power outage is not intended for this test, but is recommended where a facility power outage has not occurred within the last 36 months.
- Emergency power systems must be maintained to ensure to a reasonable degree that the system is capable of supplying service within the time specified for both the type and the class. The

maintenance procedure and frequency should conform to the manufacturer's recommendations. In the absence of such recommendations, Figure A.8.3.1(a) of NFPA Standard 110 suggests periodic (weekly, monthly, quarterly, semiannually and annually) visual inspection, checking, changing components, cleaning and testing of the following:

- Fuel.
- Lubrication system.
- Cooling system.
- Exhaust system.
- Battery system.
- Electrical system.
- Prime mover.
- Generator.
- General conditions of emergency power systems (any unusual condition of vibration, leakage, noise, temperature or deterioration), and service room or housing housekeeping.
- Restore systems to automatic operation condition.

NFPA Standard 111

Stored electrical energy emergency power systems subject to compliance with the requirements of NFPA Standard 111 must be maintained as follows:

- Equipment must be inspected monthly and tested quarterly under connected load for a minimum of 5 minutes. The monthly inspection must include the following:
  - Battery and associated charger/control equipment must be checked to verify that they are in a clean and satisfactory condition.
  - Battery electrolyte levels, individual cell voltages and specific gravity must be checked.
  - Conditions of the plates and sediment of free-electrolyte, lead-acid batteries in transparent containers must be checked.
  - A load test must be performed and the output voltage, the battery voltage, and the duration of the test must be recorded at the beginning and end of the test for each battery set.
  - All indicator lamps, meters, and controls must be checked to verify that they are operating correctly.
- Stored emergency power systems must be checked annually at full load for time duration as specified in NFPA Standard 111.
- Transfer switches must be tested semiannually.
- A regular maintenance and testing program must be established. The maintenance procedure and frequency should conform to the manufacturer's recommendations. In the absence of such recommendations, Table A.8.3.2 of NFPA Standard 111 suggests periodic (weekly, monthly, quarterly, semiannually and annually) visual inspection, checking, changing components, cleaning and testing of the following:
  - Battery.
  - Energy conversion equipment.
  - Battery charger.
  - Load current (check quarterly).
  - Transfer switch (tested semiannually).

Certificate of Fitness, Certificate of Qualification, Company Certification and FDNY Permit requirements

Topics	Required C of F or C of Q	Required Company Certification	FDNY Permit Required
Module 1: Primary Fire Protection Systems			
Sprinkler system	S-12/S-15	No	No
Standpipe system	S-13/S-14	No	No
Fire Alarm system	S-95/FLSD: Visual inspection	No	No
	S-78/F-78: inspection & cleaning of smoke detectors	Smoke detector company	
	S-97/S-98: install, repair, servicing fire alarm system	Smoke detector company or Central station company	
Fire guard for out-of-service fire protection system	F-01	No	No
Module 2: Other Fire Safety-Related Building Systems			
Refrigerating system	Q-01	No	Yes
Emergency power system	Q-01or FLSD or other licensed professionals listed in the emergency power system section of this material.	No	Yes[a]
Battery system	B-29	No	No
Elevators-in-readiness	No	No	No
Non-water fire extinguishing systems	No[b]	No	No
Means of egress	No	No	No
Commercial cooking system	P-64/F-64/W-64	Commercial Cooking Exhaust System	Yes
Module 3: Other Fire Safety Operational and Maintenance Requirements			
Hot work operations	G-60: Torch operation F-60: Fire guard for torch operation	No	Yes
Fumigation and insecticidal fogging operation	W-97	Fumigation and Thermal Insecticidal Fogging Operation	No
Storage, use & display of decorations	No	No	No
Emergency planning & preparedness	FLSD (F-89/T-89)	No	No
Portable fire extinguishers	W-96	Portable Fire Extinguisher Servicing	No

i. Emergency power system operating on fuel oil requires an FDNY permit for oil storage.

ii. Foam fire extinguishing system must be supervised by an S-15 C of F holder

Logbook entry requirements

- FLS staffing

Identification of the FLS Director and deputy FLS director(s) (name and C of F number), availability of FLS staff members on duty each day or shift during regular business hours.

Any FLS staff changes, FLS on-site examinations, amendments, and date of the plan acceptance by the FDNY.

- Daily entries

The name of the person who made the entry, the Certificate of Fitness number of the FLS director on duty, and the time each tour of duty began and ended, must be entered in the FLS log book on a daily basis.

- Fire incidents and any implementation of FDNY plan

(1) Date and time of the occurrence of any activation of the fire alarm system or any fire-related incident.

(2) Location of the alarm activation and activated detector type

(3) Any implementation of the fire safety and evacuation plan.

Entries must be made of any evacuation, partial evacuation or other implementation of the fire safety and evacuation plan, including the affected floors, in-building relocation areas to which they were directed or other directions given.

(4) Any notifications to the FDNY or other agencies

(5) Responding department unit and officer

- Fire alarm system off-line entries

If the fire alarm is taken off-line, the following entries should be made:

(1) Date and time off-line

(2) Name and C of F number of the person who took off-line

(3) Reason off-line

(4) Central station name, phone number of the central station, name and the C of F number (or ID number) of the operator

(5) Date and time restored

- Non-fire emergency incidents and any implementation of FDNY plan

(1) Date and time of the occurrence of any non-fire emergency incident.

(2) Any implementation of the non-fire emergency action plan.

Entries must be made of any evacuation, partial evacuation, in-building relocation, shelter-in-place, or other implementation of the emergency action plan, including the affected floors, in-building relocation areas to which they were directed or other directions given.

(3) Any notifications to the FDNY or other agencies

(4) Responding department unit and officer

- Drills

The record of each drill that is conducted must be included in the FLS logbook. It is recommended to include the following information:

(1) the date and time of the drill;

(2) the person(s) conducting the drill, including the Certificate of Fitness number of any drill conductor;

(3) the FLS staff members participating in the drill;

(4) date and time that required notifications (to Department and other agencies) were made, and persons receiving such notifications

(5) identification of the floors or other areas of the building or occupancy, and the number of building occupants participating in the drill;

(6) the type of drill conducted (fire or non-fire emergency, and indicate type of scenario, if applicable, and/or stairway familiarization)

(7) the special needs addressed;

(8) the problems encountered;

(9) if an evacuation drill was conducted, the weather conditions and time required to accomplish the evacuation; and

(10) an outline of the drill content.

The drill conductor, if not a member of the emergency preparedness staff of the building or occupancy, must maintain a record of each drill, the location of each presentation, the problems encountered, and an outline of the drill content.

- <u>FLS staff training</u>

(1) the date of training session;

(2) the person(s) conducting the training session, the person's Certificate of Fitness number;

(3) the persons attending the training session; and

(4) the type of training session conducted (live or computerized instruction).

- <u>Fire alarm, sprinkler, standpipe and emergency power systems</u>

The FLS logbook should include the record of any inspection, test, and maintenance of fire alarm, sprinkler, standpipe, emergency power systems. The entries should include

(1) The date, the name, Certificate of Fitness or other license number of any contractor responsible for inspecting, testing and/or otherwise maintaining the building's sprinkler and standpipe systems.

(2) The job type (inspection, maintenance or test)

(3) The frequency requirement (daily, weekly, monthly, etc.)

(4) Condition found and any action taken regarding to the condition

(5) Out-of-service record:

- Date and time
- Description of condition, affected areas
- Notification for out of service and the person receiving the notification
- Action taken
- Date and time restored
- Notification for restoring
- Responsible impairment coordinator

- Phase I and Phase II elevator operations

The FLS logbook should include the record of any test of phase I and phase II elevator operations. The entries should include

(1) The date of testing,

(2) person who performed the test: Indicate the name and number of the Certificate of Fitness holder (if applicable) or other building personnel (by job title) or a contractor (title and company name).

(3) condition found and any action taken regarding to the condition.

(4) The elevator keys have been verified to be located in approved location.

- Smoke control systems

The FLS logbook should include the record of any inspection and test of dedicated and/or non-dedicated smoke control systems. The entries should include:

(1) The Date of the inspection/test

(2) Name of the person who performs the inspection/test

(3) Job type (inspection/test)

(4) Normal power/ emergency power

(5) Condition found and any action taken regarding to the condition

- Commercial cooking equipment systems

Indicate the name and number of the Certificate of Fitness holder (if applicable) or other building personnel (by job title). If inspection, testing or other maintenance is to be performed by a contractor, indicate as much in the plan, and identify the contractor in the FSP logbook.

- FLS staff on-site examinations

The FLS logbook should include the record of any on-site exam taken place in the premises. The entries should include:

(1) The on-site exam type

(2) Date and time of the on-site exam

(3) Name of the candidate who took the exam

(4) Name of the FDNY inspector who administered the exam