

# UTILIZATION OF ELEVATORS DURING FIRE EMERGENCIES

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## ABSTRACT

Smoke control and fire protection systems for elevators in buildings are herein discussed. The existing code ASME/ANSI A17.1 Rule 211.3 Firefighter Service - Automatic Elevators, pertaining to emergency operation of elevators is examined. Recommendations are made for improvement. The inappropriate use of elevators under Phase II is addressed. The installation of sprinkler protection in elevator hoistways and elevator machine rooms is examined. A new design is recommended. The holistic approach for the safe use of elevators for occupant evacuation during fire emergencies is examined. Recommendations are made to bring elevator systems to a level of safety that can support their use during fire emergencies.

## INTRODUCTION

Elevators transport more people with a safety record that surpasses any other means of transportation. The utilization of today's high-rise buildings is feasible only because modern, fast moving elevators permit access to and egress from upper stories. Persons who are physically handicapped require the use of elevators for access to all stories above the ground floor. It is essential that the elevator industry provide elevators that are equally safe for evacuation during a fire emergency. The handicapped person must have safe egress from buildings which elevators have provided them with safe entry. Before approaching the problem of egress from high-rise buildings during a fire emergency, the use of elevators under current Rule 211.3 Firefighters Service is examined and suggestions for improvement will be offered.

## INAPPROPRIATE USE OF PHASE II

It has been established practice in some buildings to record the normal locations of all handicapped persons known to be in the building. This record keeping is a highly recommended practice and should be encouraged. However this practice creates problems when used as follows. During a fire emergency after the elevators have been recalled under "Phase I Emergency Recall" security personnel are assigned to operate the elevators using the special firefighters elevator key. Security personnel place the elevators in "Phase II Emergency In-Car Operations" and respond to the recorded location of the handicapped persons and remove them from the building via the elevators. This procedure is potentially hazardous. Anyone familiar with the history of elevators during fire emergencies, would not put such a procedure into operation.

No one should operate an elevator under "Phase II Emergency In-Car Operations" during a fire emergency except trained emergency service personnel complying with the following safety regulations:

- (1) Fully trained for firefighting as prescribed by NFPA 1001.
- (2) Fully protected by Firefighters protective clothing as prescribed by OSHA and the NFPA.
- (3) Abiding by all safety precautions as prescribed by the Authority Having Jurisdiction, a sample of such precautions are included in Appendix A.

## RECOMMENDED CHANGE TO ASME/ANSI A17.1 1987

The following change is recommended to ASME/ANSI A17.1b-1989 for the reason as stated.

The fourth paragraph of Rule 211.3a shall be eliminated.

Paragraph four states: "When the designated level three-position is in the "BYPASS" position, normal elevator service shall be restored independent of the smoke detectors required by Rule 211.3b."

REASON: It is not in accordance with recommended safety practice to permit a safety device to be overridden without correcting the condition that caused the activation of the safety device. The cause/condition that activated the smoke detector should be corrected or eliminated. If a smoke detector is mal-functioning, then it should be replaced. Providing the means to override the safety device that is warning of a potentially hazardous condition instead of correcting the condition, is an invitation to have the elevator recall system "off line" when a real fire emergency occurs. This could result in the loss of lives. If the means are provided to have elevators operate without the protection of the elevator Smoke-Detector Recall-System "on line", then instead of repairing the system, the safety system will be compromised and the elevators operated in the "By-pass" mode. Thus this "By-pass" position is potentially dangerous, and is conducive to unsafe practices. It should be eliminated!

### **SPRINKLERS IN ELEVATOR HOISTWAYS AND MACHINE ROOMS**

A fire in a non-sprinklered elevator machine room can take the following course. Let us consider a building in the range of 25 to 30 stories with one bank of four elevators. A fire develops in the non-sprinklered machine room during the night. The alarm is sounded. The fire department responds to the location. Firefighters can not use the elevators because the fire has spread to the machinery for all of the elevators. The firefighters must then walk up to the elevator machine room with their heavy equipment. Upon their arrival at the machine room, the fire is practically out because it has consumed all combustible material in the machine room. As a result all four elevators are out of service and all the elevator machinery must be replaced. This high-rise building for all practical purposes is not usable. The business activities conducted in the building are interrupted. The elevator machine room must be completely refurbished. Provisions must be made to get all

the new equipment up to the elevator machine room. The time necessary for repairs is over 30 days. The building and its business tenants are out of operation for at least that period of time. If the elevator machine room had been sprinklered, the potential for a complete burnout of the elevator machinery of all four elevators is very unlikely. The interruption to the business of the building would be held to a minimum and repairs would be less costly.

Sprinkler protection should be provided in all areas of a building to be considered fully sprinklered. This should include elevator hoistways and elevator machine rooms. The fire hazard in elevator hoistways is in the elevator pits, where rubbish and lubrication drippings are often permitted to accumulate. To prevent any fire in the elevator pits developing to a degree where it would be a threat to the occupants of the building, and to minimize the interruption to the business conducted in the building, sprinkler protection of the elevator pits should be provided. The installation of sprinklers in the upper parts of the elevator shaft is not considered a valid requirement. The occurrence of a fire in an elevator shaft above the elevator pits is unusual.

Sprinkler protection of the elevator machine room is a valid requirement. The potential for fire in these machine rooms is a reasonable possibility. The protection afforded by sprinklers will prevent small fires at this location from becoming a threat to the building occupants and diminishing the possibility of a major business interruption. The possibility of trapping occupants in an elevator car can be guarded against, when the sprinkler system is designed and installed correctly. The possibility of passengers being trapped in a stalled elevator car between floors can be reduced to the absolute minimum.

The type of system advocated for this installation is a "Combination Dry-Pipe and Pre-Action" system. This "Combination Dry-Pipe and Pre-Action" system would be connected to the "Smoke-Detector System" currently required in the machine room. To achieve water flow and fire suppression from the sprinkler in the machine room two events must occur:

(1) The smoke detector must be activated to place the "Combination Dry-Pipe and Pre Action" system in the "ALARM" mode but no air would be released and no water would flow.

(2) When a fire occurs the sprinkler will fuse when the temperature reaches the setting of the sprinkler. When the sprinkler fuses the air contained in the "Combination Dry-Pipe and Pre-Action" system will escape. The dry pipe valve will

open permitting water to flow into the system and be discharged from the sprinkler.

Having this double protection will prevent any water from flowing from the sprinkler as a result of mechanical damage to the sprinkler system. When the smoke detector has not placed the dry pipe valve in the "Alarm" mode water will not flow from the system. Conversely, activation of the smoke detector will not cause any water to flow until the temperature causes the sprinkler to fuse and the air in the system released.

The activation of the smoke detector in the elevator machine room will initiate "Phase I" recall of the elevators and return all elevator cars to their designated level. This will reduce the possibility of persons being trapped in the elevator car. The time-lag between the activation of the smoke detector and the fusing of the sprinkler will under normal fire conditions be adequate to accomplish the return of all elevator cars to their designed level. When the elevator cars have returned to their designed level (or at least before the dry pipe valve has actuated) the main power to the affected elevator should be automatically disconnected. As stated later, elevators should be designed to return to the designated level whenever power is interrupted. All other provisions of Rule 102.2(c) and (4) shall apply. The use of "on/off" sprinklers in the elevator machine room would keep water damage to a minimum. This type of sprinkler would only permit water to flow while the temperature on the head is above 160 °F. When the temperature is reduced the water flow will cease, thus water damage will be greatly reduced.

## **REQUIREMENTS FOR ELEVATORS TO BE UTILIZED FOR EVACUATION OF BUILDING OCCUPANTS DURING A FIRE EMERGENCY**

The list below is not all inclusive nor is it in any order of priority. It is not a pick and choose list of options either. It is a tabulation of concepts that must be included in a holistic approach when designing elevator systems that can be safely utilized for evacuation during a fire emergency, assist fire fighting operations, eliminate costly fire damage repairs and to reduce the interruption to the business activities of the building.

- (1) The building **MUST BE** fully sprinklered.
- (2) Elevator shaft shall be pressurized.

(3) Elevator lobbies on all floors shall be enclosed.

(4) Elevator lobbies shall be pressurized.

(5) Air intakes for the elevator shaft and lobby pressurization systems must be from a smoke free location.

(6) All elevator lobbies shall be protected by smoke detectors.

(7) Elevators systems shall be made resistive to water.

(8) When a power failure occurs, all elevators shall return to their designated level.

(9) All elevators shall be capable of being operated on an emergency power generator.

(10) All elevator lobbies shall have access to a pressurized stairway without passing through another fire area.

(11) All elevator cars shall have a means for two way voice communication between the elevator car and the fire command station.

(12) All elevator lobbies shall have a means for two way voice communication between the elevator lobby and the fire command station.

### **1 The Building Shall be Fully Sprinklered**

To mitigate the danger to persons using elevators during the occurrence of a major fire in a building, the building must be sprinklered throughout in accordance with "NFPA 13 Standard for the Installation of Sprinkler Systems". This is a prime requisite and any attempt to circumvent this provision should be resisted.

### **2 Elevator Shafts Shall be Pressurized**

Elevator shafts, as a result of "stack effect" in high rise buildings, are usually the area of lowest pressure on a floor. In the event of a fire, the tendency is for the smoke and heat to flow towards and up the elevator shafts. If the elevator shaft was pressurized to 0.05 in. of water (12 Pa) the elevator shaft would no longer be the low pressure area on the floor and smoke and heat would no longer flow into the elevator shaft, thus keeping it smoke free.

Most jurisdictions require that elevator shafts be provided with means of venting smoke and hot gases to the outer air. This vent area is required to be 3.5% of the total shaft area or at least 3 ft<sup>2</sup> (278.7 mm<sup>2</sup>) per elevator car whichever is greatest. A variance for this requirement can usually be obtained. The variance should provide that elevator shaft vents may be maintained closed and

have provisions to be opened then during a fire if necessary. Controls for this purpose should be located at the Fire Command Post in the lobby. This is an area where existing codes could be changed to allow for advances in smoke control by controlling air flows. The closing of these elevator vents would permit the elevator shaft to be pressurized and prevent the flow of smoke and heat into the elevator shafts during a fire.

The pressurizing of the elevator shafts have supplementary benefits. Some of these are:

(1) As in stair pressurization, the long held desire of the fire service to obtain an elevator shaft that is smoke tight is achieved. All openings between the shaft and the rest of the building must be sealed in order to obtain the desired pressure differential. The result is a smoke-tight elevator shaft.

(2) By closing the elevator shaft vents, the elevator shaft will no longer be a conduit by which heat is lost during the heating season and cool air is lost during the time when air-conditioning is required. This could result in a significant reduction of costs and conserve energy.

(3) During cold and windy days, the opening and closing of the shaft-way and elevator car doors will be achieved with much less strain and wear on door operating motors. Maintenance costs are thereby reduced and down time is lessened.

### **3 All Elevator Lobbies Shall be Enclosed**

Elevator lobbies on all floors shall be enclosed with partitions rated at least 2 hours. The doorways in these partitions shall be protected by rated door assemblies of at least 1½ hours. The doors in these partitions may be maintained in the open position, provided they close automatically when an alarm of fire is received in the building from whatever source.

The reason for these enclosed lobbies is to provide an area for building occupants to remain, while awaiting elevators that is relatively safe from smoke. This space will also provide a fire-protected area between the elevator shaft and the rest of the floor.

Enclosure requirements on the lobby or street floor may be omitted provided the following conditions are present:

- (1) The floor is fully sprinklered.
- (2) There is no fire load on this floor.
- (3) Any area on this floor where a fire load might exist is separated from the elevator lobby by a two hour rated partition. Any openings in this partition shall be provided with 1½ hour rated

enclosures. Openings in enclosures shall be protected by self closing devices. Magnet devices should not be permitted to hold these door in the open position.

### **4 All Elevator Lobbies Shall be Pressurized**

The elevator lobbies on all floors shall be pressurized to a pressure differential of 0.05 in. of water (12 Pa) with respect to the remainder of the floor. This will restrict the entry of smoke into the elevator lobby. The elevator lobby will thus provide the building occupants an area of refuge while awaiting the elevators. This measure will also assist in pressurizing of elevator shaft and preclude the need for gasketing of the shaft-way doors, as would be needed if an attempt is made to pressurize the elevator shaft only. The pressurizing of the elevator lobbies will also supply building occupants with an ample supply of fresh, breathable air while awaiting the elevators during a fire emergency.

The need to have an air-tight seal between the elevator lobby and the rest of the floor in order to obtain a pressure differential will also help to ensure that all openings in the partitions are properly sealed and thus prevent the entry of smoke into the elevator lobby. The enclosed lobby will also assist in the retention of the normal heat or cool air in occupied portions of the building, thus reducing the cost and conserving energy.

### **5 The Air Intakes for the Elevator Shaft and Lobby Pressurization Systems Must be From a Smoke Free location**

Location of air intakes for the elevator shaft and the elevator lobby pressurization systems must be as smoke-free as possible under fire situations. Roof and upper level locations are not acceptable. Smoke from a fire in a building will rise under most conditions. The roof and upper levels will most likely be contaminated with smoke early in the fire. To locate air intakes at these locations is not acceptable. The protection of these intakes by smoke detectors has also not proven satisfactory since these devices are not reliable during cold weather. When they do function the pressurization system is lost. It is advisable to locate these intakes as remote from the building as possible. Where this is impossible the intakes should be located as low in the building as possible. Considering the design of most high-rise buildings in major city environments, the second floor is

probably the most the likely place for their location. This is the usual location of air inlets for lobby and below-ground HVAC systems intakes.

**6 All Elevator Lobbies Shall be Protected by Smoke Detectors**

Smoke detectors in elevator lobbies are required where elevators are to be used to evacuate building occupants during a fire. This is to prevent the elevator from stopping on any floor where the elevator lobby may have become contaminated with smoke.

**7 The Elevators Systems Shall be Made Resistive to Water**

Because of the adverse effect that water has upon the safe operations of an elevator, it is imperative that elevators be made resistive to water. It is not expected that elevators be made to operate under water, but much can be done to improve the present vulnerability of the elevator systems to the presence of the least amount of water. Water in an elevator shaft can enter controls and other electronic devices causing elevators to operate in an erratic and unsafe manner. As more and more buildings are fully sprinklered the potential for elevator failure due to water intrusion will become more prevalent. If elevators can be designed to operate on the exterior of buildings exposed to the elements, it is not beyond current design capabilities to have elevators within buildings operate safely when water enters the elevator shaft.

Measure should be taken to prevent water from entering elevator shafts and as a corollary, precautions should be taken to contain any water that may enter the shaft. The entire electrical control system of elevators, including door interlocks, door protective devices, motors, brakes, drives, door operating devices, door controllers, cabinets, junction boxes in hoistway and on cars, conduits, limit switches, safety switches, floor selection and leveling systems, all signal fixtures, car lights, outlets etc. shall be NEMA 4 rated or of NEMA 4 type approved design. Travelling cables shall be of a type approved for outdoor use in wet environments.

The elevator car shall be designed to deflect falling water away from the door openings. The roof of the car should be designed to prevent pooling or collection of water. The car shall be

sealed to prevent water from entering through panel joints, lights, fan, vents, or emergency exits.

Elevators that are to be used for the evacuation of building occupants during a fire must be made impervious to water.

**8 If a Power Failure Occurs all Elevators Shall Automatically Return to the Designated Level**

All elevators used to evacuate building occupants during a fire shall return to the designated level in the event of a power failure. Precautions must be taken to prevent building occupants from becoming trapped due to a power failure during a fire. A power failure during a fire in a building is a foreseeable event and as such requires planning before the event. It is within technology now available to design elevators that will not trap occupants due to a power failure. This should be done without using emergency power generators. One available method is the use of a battery back-up system. This provision can also be extended to other elevator failures with the proper safeguards.

**9 All Elevators Shall be Capable of Being Operated on Emergency Power**

All elevators that are to be used for the evacuation of building occupants during a fire shall be capable of being operated on emergency power. The emergency power shall be sufficient to operate all elevators simultaneously. The capacity of the fuel supply for the emergency generator shall be capable of supplying the total emergency power load for at least 6 hours.

**10 All Elevator Lobbies Shall Have Direct Access to a Pressurized Fire Stair Without Passing Through Another Fire Area**

Building occupants awaiting an evacuation elevator in the elevator lobby on an upper floor shall have direct access to a fire stairs. This is to provide a means of egress if the evacuation elevator fails to respond to their floor. Occupants in the elevator lobby should not be required to pass through a fire area to gain access to a means of egress. Fire stairs must be accessible from elevator lobbies.

**11 All Elevator Cars Shall Have a Means for Two-Way Voice Communication Between the Elevator Car and the Fire Command Post**

Occupants of elevators shall have the capability to communicate via voice communications between their elevator car and the Fire Command Post. This provision is necessary in case of failure of an elevator car. The occupants would then be able to communicate this fact to operating personnel at the Fire Command Post. Necessary action to alleviate their situation can then be taken.

**12 All Upper Floor Elevator Lobbies Shall Have a Means for Two-Way Voice Communication Between the Elevator Lobby and the Fire Command Post.**

Building occupants shall have the ability to communicate via voice communications between their elevator lobby and the Fire Command Post. This provision is necessary so that occupants of any elevator lobby may transmit any problems they may encounter to the operating personnel at the Fire Command Post. Necessary action to alleviate their problem can then be taken.

## **APPENDIX A ELEVATOR SAFETY**

**Safety precautions that must be observed by fire fighters when operating an elevator under existing provisions of Phase II (firefighter service) during a high-rise building fire. (This is not for the use of elevators designed to be used for evacuation during a fire).**

To maintain adequate logistical support for fire suppression and rescue operations in a high-rise building it is a necessity that elevators be used. To meet this need it is imperative that all firefighters be trained in the safety precautions that must be observed when using elevators under fire conditions. These safety precautions are:

(1) Elevators shall not be used if the fire is on the 7th floor or below. It is safer to utilize the fire stairs or fire tower to reach the operating post, which is two floors below the fire or the fire floor.

(2) Do not utilize the elevators in a bank that serves the fire floor, if a lower bank of elevators reaches within five floors of the fire floor.

Firefighters not burdened with hose or other equipment may prefer to utilize the seven floor figure, as in (1), for reasons of safety.

(3) The service elevators shall not be used until the service elevator lobbies on the fire floors have been checked to insure that the lobbies are not involved in the fire, and their use has been sanctioned by the officer in command of the fire.

(4) An elevator car shall not be used if any items other than fire department equipment are in the car. All items must be removed before use by the fire department.

(5) Before entering the elevator car, all members shall have donned their protective breathing apparatus. The facepiece shall be maintained in the stand-by position.

(6) The operation of the elevator car in "Firefighter Service" (Phase II) shall be by Fire Department personnel familiar with safe operating procedures.

(7) Not more than six members shall be permitted in any elevator car. This precaution will accomplish two objectives. It will prevent overloading of the elevator car and if the car is disabled it will limit the number of members placed out-of-service.

(8) There must be a member equipped with a "Handie-talkie" in each elevator car whenever the elevator is in use.

(9) There must be an forcible entry tool ("Claw", "Kelly" or "Halligan") tool carried aboard each elevator car to be used as follows:

(a) In the event that the car does not stop at the selected floor, one of the above tools may be used to pry the elevator car doors open, disengaging the car door interlock, stopping the car. The car doors can be opened by hand because only 30 lbf (13.6 kg) force is required to open the car doors. The use of an iron is faster and more positive.

(b) In event the car should become disabled, one of the above tools may be used to extricate the members.

(10) When it is necessary to utilize an elevator in a bank which serves the fire floor:

(a) Utilize the "Firefighter Service" elevator cars in that bank.

(b) Determine if possible, if the fire floor is served by an access stairs. Select a floor no closer than two floors below the fire floor, or two floors below the lower level of the access stair in the fire area, whichever is lowest.

(11) All units shall before leaving the "Lobby Command Post" ensure that their unit designation, destination, elevator bank and car number being used has been recorded.

(12) Before leaving the lobby and at each precautionary stop, a flash light shall be directed up between the elevator car and the hoistway shaft to determine if there is any accumulation of smoke in the elevator shaft. The elevator shall not be taken into a heavy smoke accumulation.

(13) Elevators shall be stopped every five floors ("precautionary stops") to:

(a) Confirm that the elevator will respond to the selected floor. At each floor a new selection shall be made.

(b) The relationship of the elevator to the stairways shall be noted and confirmed by actual observation at the first precautionary stop. This is necessary in the event that the elevator should inadvertently stop at the fire floor and the car must be abandoned. The assistance of the "You Are Here" sign can be used to assist in the location of the fire stairs. This shall also be done at the last precautionary stop before the selected floor as the floor configuration may change.

(c) Before leaving the precautionary stop, a flash light shall be directed up between the elevator car and the hoistway shaft to determine if there is any accumulation of smoke in the elevator shaft.

(14) To operate the elevator in "Phase II" "Firefighter Service, place the "1620" (outside New York City use "Special Key") key in the keyed switch in the car and turn to the "Firefighter Service" position upon entering the elevator car. Press the "Door Close" button and select a floor. As soon as the car begins to move, press the "Call Cancel" button. The car should stop at the next available landing in response to the "Call Cancel" button. When the car stops, select another floor on the "Floor Selection" panel.

(15) If the car does not stop at the next available floor in response to the "Call Cancel" button:

(a) Immediately select the next available safe floor. When the car stops at the next available floor, press the "Door Open" button and leave the car. Mark the car as being defective and notify the Command Post the car is out of service.

(b) If the car does not stop at the next available floor, attempt to stop the car by forcing the car doors open, thus activating the interlock switch. Notify the "Command Post" via Handie-talkie to initiate emergency evacuation procedures.

(16) If the car is operating normally when you reach the selected floor, press the "Door Open" switch. You must keep finger on this "constant pressure" button until the door is fully open, otherwise the door will automatically close. This is a built in safety feature, which will automatically

close the doors if adverse conditions are encountered.

(17) If the doors open on heat and smoke, the simple removal of the finger should cause the doors to close:

(a) If they fail to close automatically, press the "Door Close" button and manually assist the closing.

(b) If the door still fail to close, don the facepiece and evacuate the elevator. Proceed to the nearest stairway which was determined by the procedure in item (13).

(18) If conditions are normal on the floor selected, hold the "Door Open" button until the doors are fully opened. The door will remain open.

(19) The elevator shall not be returned to the lobby floor until the officer has determined that the unit has arrived at the proper location.

Due to the need for security, it is often necessary to force your way out of an elevator lobby on upper floors. (In this case we mean the elevator lobby, not the elevator car). This is another reason for engine companies to carry their assigned tools. They may have to force their way out of the elevator lobby to reach a fire stair or fire tower, either for reasons of safety or in order to operate. A firefighter shall be assigned to stay with the elevator, to see that it is not moved from the floor, until safe access to the fire stairs or fire tower is assured.

(20) To move from any floor, the "Door Close" button must be pushed, and another floor selected.

(21) An elevator car can only be placed in "Phase II", "Firefighter Service" or taken off "Phase II", "Firefighter Service" when the car is at the landing where the lobby key switch is located.

(22) Whenever an elevator car has been placed in "Phase II", "Firefighter Service" it shall be operated by a firefighter in the car.

(23) For security reasons, some occupancies lock the hoistway doors on the elevator shaft on their floors before leaving for the day. It is now illegal in New York City to lock a hoistway door except with a New York City Fire Department 1620 key, but you may still encounter it:

(a) If your elevator arrives at a floor and the car doors cannot be opened using the normal procedures, make no attempt to force them. In this instance the locked hoistway doors, attached by a vane to the elevator car doors, is keeping the doors closed. Any attempt at forcing them open may damage the interlock placing the elevator out of service.

(b) If you arrive at a floor and the car doors open revealing locked hoistway doors, and if

the security lock can be removed and the door opened with no damage to the door this shall be done. If removal of the locking device threatens any bending or warping of the door assembly no attempt shall be made to force the door, as this may place the car out of service.

(24) The recommended procedure in both (a) and (b) of (23), is to drop down to a floor where no locks are encountered and exit the elevator car on that floor.

(25) The "Emergency Stop" button shall not be tested. It shall only be used when it becomes absolutely necessary. The use of this button will cause the car to make an abrupt stop. Members must take care during any emergency stop, to protect themselves from being thrown about, falling or getting hit with mask cylinders or tools. The use of this button also puts an abnormal strain on the hoisting cables and may even stretch them. The car must be move in an upward direction after the emergency stop button is used to allow the break to release. In some cases it may be necessary to go to the extreme top of the shaft before the elevator will return to normal operation.

(26) Water in the elevator shaft may make elevator operations extremely hazardous. Water may negate the cars electrical safeties, cars may move with car doors and the hoistway doors open. Members may become trapped between the car and the shaft. Other members may fall down open shafts under heavy smoke conditions where visibility is limited.

(27) As a general rule, in a situation where the elevator becomes erratic, exit the car at the nearest safe floor. Place the car out of service either by the car controls or by blocking the door open. The car shall be marked to prevent others from attempting to use the car. The "Command Post" shall also be notified.

(28) Should it become necessary at any time during operations to remove members or civilians from a disabled elevator car, all applicable safety precaution shall be adhered to. In New York City the applicable sections of the Training Bulletin, "Emergency-1" shall be applied.

(29) Elevators installed after the effective 1968 are not required to have roof hatches that can be opened from the interior of the car. These hatches are constructed so as to be openable only from the exterior. This is a departure from the previous code which required that these hatches be openable from both sides. Escape from the post 1968 car from the inside of the cars will require the use of forcible entry tools. Therefore no member, group of members or units shall enter an

elevator under fire or emergency conditions without bringing forcible entry tools. Also note that all elevators are not equipped with roof hatch interlocks which will prevent the movement of the car with the roof hatch open.

(30) If the Elevator Recall, Phase I was initiated automatically by the activation of a lobby smoke detector or sprinkler water flow, the elevators can not be returned to normal operating conditions until the smoke detector or water flow alarm has been cleared.

(31) Once a "Firefighter Service" car has been placed in Phase II, Firefighter Service, it will continue in Phase II operation, regardless of the position of the lobby keyed switch. This feature may be utilized to restore other cars in the bank to normal service, while the fire department continues to use the "Firefighter Service" car or cars.

(32) If more than one floor selection is made the car will stop at the nearest floor selection in the direction of travel.

(33) The above items are applicable to all elevators installed in compliance with the New York City Building Code and ASME/ANSI A17.1 Safety Code for Elevators and Escalators. A17.1 has one additional requirement. The lobby keyed switch installed in compliance with A17.1 has a position labeled "by-pass". This permits the elevators to be operated normally while a smoke detector or water flow alarm is still transmitting an alarm, This provision is not permitted in New York City.

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