

Building Emergency Response Personnel

Guidelines for Elevators

and

Use of Elevators to Investigate Fire Alarms

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Definitions

- Alarm Initiating Device - is manually or automatically operated equipment which, when activated, initiates and alarm through an alarm-signaling device.
- Alarm Signal - is an audible or visual signal, or both, indicating the existence of an emergency fire condition. Audible devices may be bells, horns, chimes, speakers or similar devices. Voice alarms and their messages shall be approved by the Chief.
- Alarm Signaling device - is equipment that produces an alarm signal.
- Alternate Landing - a level used as an alternate to the designated level, selected by the enforcing authority, that will serve the needs of emergency personnel for firefighting or rescue purposes in the event smoke detectors have activated on the designated level.
- Approved - refers to approved by the chief as a result of an investigation and test conducted by the chief or by reason of accepted principals or tests by national authorities, or technical or scientific organizations.
- Designated Landing - the main floor or other level that best serves the needs of emergency personnel for firefighting or rescue purposes.
- Fire - is the combustion of material other than deliberate combustion for cooking, heating, recreation, incineration or purposes incidental to the normal operation of a property.
- Phase-I - (Firefighter's Service Emergency Recall Operation) is an elevator feature that when activated, normal elevator service cars will return non-stop to the designated landing.
- Phase-II - (Firefighter's Service Emergency In-Car Operation) is key operated with a switch in the elevator car that when placed in the **ON** position, after Phase-I has been initiated, will make the elevator operable only by the person inside the car.
- Training - means the process of making proficient through instruction and hands-on practice in the operation of equipment, including all equipment that is expected to be used and in the performance of assigned duties.
- Experts - means having extraordinary proficiency and knowledge as well as technical skills.
- Evidence of Fire - As it relates to response team investigations means a personal observation, a report from a witness of either the smell of smoke or the sight of smoke or flames, the activation of a fire alarm pull station or the activation of more than one detector.
- Shunt Trip - means a control system which removes electrical energy from an elevator and elevator machine room prior to the introduction of water from sprinkler systems in the hoistway or machine room.

Building Emergency Response Personnel

Elevators

Personnel using elevators to investigating fire alarms must have a thorough knowledge of the elevator's basic operation and specific knowledge of the elevator's Firefighter's Service controls.

Throughout the years elevator codes have changed. Not all firefighter's service controls function the same. It is imperative that all BERP personnel be familiar with the exact nature of Firefighter's Service in their building. To accomplish this, it is recommended that building management engage their regular elevator maintenance company to map the exact functions of the Firefighter's Service systems. Firefighter's Service Evaluation Form (FFS-1), pages 13 through 16, is included to assist the building owner in performing the evaluation. BERP members may then learn exactly how their elevators respond to Firefighter's Service control.

I. Firefighter's Service -- General.

Phase-I Firefighter's Service is designed to automatically return the elevator to a designated landing in the event that smoke is detected in the building. If smoke is detected on the designated floor, the Phase-I Firefighter's Service controls will route the elevator to an alternate landing.

Phase-I Firefighter's Service initiates automatically when energized by smoke detectors. It can also be manually initiated by use of a keyed switch.

When Phase-I is activated, the elevator returns non-stop to the designated level (or alternate landing if smoke detectors indicate a problem on the designated level). The elevator car parks on the designated level, the doors open* and the elevator no longer responds to car buttons or hall call button.

After activation of Phase-I Firefighter's Service, Phase-II is available for use by emergency response personnel. Phase-II allows manual operation of the elevator from within the elevator car. The elevator can then be used to move emergency personnel to any floor served by the elevator without interference from hall call button, automatic Phase-I recall or other automatic functions. Control of the elevator is given exclusively to the operator of the elevator.

** Buildings constructed under Houston's high-rise code between the years 1979 and 1997 may have elevator doors that open for a predetermined time and then close. The doors can be opened with a button or switch in the fire command station, or with the Door-Open button inside the car.*

II. Investigating a Fire Alarm.

1. General

The purpose of the BERP team is to investigate the cause of automatically activated alarms. In the event of a fire, BERP are available to assist in the evacuation of occupants on the fire floor, the floor above and the floor below, if it is safe to do so. *BERP should never use an elevator to evacuate people from the building.*

2. Personnel Required

A minimum of two (2) BERP members are required in the elevator car if while in Phase-II mode, turning the Phase-II switch to the **OFF** position will automatically return the elevator car to the designated landing; or,

A minimum of three (3) BERP members are required in the elevator car if while in the Phase-II mode, turning the Phase-II switch to the **OFF** position **WILL NOT** automatically return the elevator to the designated landing. In this instance, one of the three (3) BERP members must serve as elevator operator and direct the elevator to the designated level by pressing the appropriate in-car floor button and riding in the elevator to the designated landing.

3. Equipment Required

All BERP members shall be equipped with:

1. Portable two-way radio capable of providing constant two-way communication with the fire command room.
2. Elevator car keys, stairwell re-entry keys and other access keys or key cards.
3. Flashlights.

III. Procedures.

1. Location of BERP members.

The Fire Safety Director must make record of the number of BERP members responding to the alarm, their location, itinerary and means of travel (elevator, stairs, etc.) to the problem area.

This information must be readily available to fire department personnel upon their arrival.

2. Elevator Use Prohibitions.

- (i) **DO NOT** use elevators unless they are equipped with both Phase-I and Phase-II Firefighter's Service controls.
- (ii) **DO NOT** use elevators regardless of their Firefighter's Service status if there is evidence of a fire.
- (iii) **DO NOT** use elevators in any mode other than Phase-II to investigate an automatically initiated fire alarm.
- (iv) **DO NOT** use elevators to investigate an alarm if Firefighter's Service Phases-I and -II have not been thoroughly inspected and proved to operate according to standards recognized by the Fire Marshal.
- (v) **DO NOT** use elevators equipped with a "Shunt Trip."

3. Operating the Elevator.

Cautions: *An elevator in the "Independent Service" mode may, or may not, respond to Phase-I recall.*

*Where a "Bypass" position is available on the key-switch located outside the elevator (usually at the designated level) --- switching to **BYPASS** mode places the elevator in a normal, automatic operating mode. The **BYPASS** position bypasses Phase-I but will not bypass Phase-II until the elevator has returned to the designated level.*

- (i). Activate Phase-I recall for all elevators serving the floor of incident.

Activate Phase-I recall for the elevator (if separate from those serving the floor of incident) that will be used in this procedure.
- (ii). Activate Phase-II Firefighter's Service for the elevator to be used by BERP personnel.
- (iii). The following basic operational test of Phase-II is required before traveling to the chosen floor (floor of BERP demarcation).

TEST – A Mode: Phase-II

Note: Door-Open/Door-Close buttons require continuous pressure while the door is in the process of opening or closing.

- (a) Depress and hold the Door-Close button until the door closes completely. Release the button. The door should remain closed.
- (b) Depress and hold the Door-Open button until the door is completely open. The door should remain open.
- (c) Depress the Door-Close button and release it when the door is approximately half closed. The door should immediately stop and reverse direction and rest in the fully open position.
- (d) Depress and hold the Door-Close button until the door closes completely. Now depress the door open button and release it when the door is approximately half opened, the door should immediately stop and reverse direction resting in the fully closed position.

If any of the above tests fail to produce the required results, abandon that elevator and perform the same series of tests on another elevator. **DO NOT** use any elevators that fail this test.

TEST - B Mode: Phase-II

Note: The elevator should not respond to any hall or corridor call buttons. Only the in-car floor call buttons should register in the mode.

- (a) Depress the in-car floor call button for a floor approximately halfway in the ascent to the floor of BERP demarcation (no closer than two (2) floors below the floor of incident). The elevator should proceed non-stop to the floor for which the button was pressed.
- (b) When the elevator arrives at the test floor (approx.

halfway to the floor of demarcation) perform **Test-A** (steps 'a' through 'd' in subsection 3-(iii) above).

4. **Traveling to the Floor of Demarcation.**

DO NOT travel to the floor of incidence in the elevator. Stop the elevator and disembark no closer than two (2) floors below the floor of incidence. The BERP demarcation floor must never be closer than two (2) floors below the floor of incidence.

- (i). BERP members shall stop the elevator at least two (2) floors below the floor of incidence and disembark at that level.
- (ii). The elevator shall be returned to the designated landing either automatically by placing the Phase-II switch in the **OFF** position (if the elevator is designed to allow that operation) or by one of the three (3) BERP members (see Personnel Required, Section II-2).

IV. BERP Actions from the Floor of Demarcation.

Once the elevator has been dispatched to return to the designated landing, BERP members shall:

- 1. use the safest stairwell to ascend to the floor of incidence.
- 2. stay together and maintain radio contact with the Fire Safety Director, reporting their location and actions at all times.
- 3. look first for evidence of fire. If evidence of fire is found, BERP members shall immediately report conditions and locations to the Fire Safety Director. Both BERP members should then assist in the evacuation of occupants from affected floor(s) into stairwells, if it is safe to do so.
- 4. upon completing the investigation or evacuation, BERP members are to return to the command center to assist the fire department as needed.

A BASIC OPERATIONAL TEST OF

PHASE-I FIREFIGHTER'S SERVICE

I. A three (3)-position switch must be provided at the main floor {designated level} (on / off / bypass).

1. When the switch is turned to the **ON** position, all automatic cars must return to the designated level and park with the doors open.

Exception: High-Rise Buildings constructed under Houston's high-rise code between the years 1979 and 1997 would have the doors open for a predetermined time and then close. The doors could be opened with a button in the fire command station, or from inside the car.

2. Turn the in-car key switch **OFF** with the car at the designated level. With the inspector in the car, register several floor calls and allow the car to run. As the car leaves the floor, turn the main (designated level) floor key-switch to the **ON** position. The car must stop and reverse at or below the next available floor without opening its doors and then return to the designated level. The "emergency stop" switch should be automatically rendered inoperative during this return phase of operation.

While the car is descending, operate the "emergency stop" switch to see that it has been rendered inoperative. Also, Check to see that the car will not respond to any car calls, and that all registered lights and lanterns have extinguished and remain inoperative.

3. With the designated level key-switch in the **OFF** position, run the car to any floor. With the doors open have the designated level key-switch turned to the **ON** position. Check to see if the door reopening devices are inoperative at this point. These are the devices that are sensitive to smoke, heat and flames. The mechanical safety edge of the door should remain operative, however.

With the doors in the open position, activate the "emergency stop" switch. It should be operative at this point (the doors may or may not close at this time, but the car should not move with the "emergency stop" switch activated).

4. Return the "emergency stop" switch to the **RUN** position. The doors should close without delay and the car should proceed to the designated level as described in #2 above.

NOTES: Use of the **BYPASS** position on the designated level key-switch will cause smoke detectors in each elevator lobby and associated machine rooms to be deactivated or "bypassed", and cause the elevator to return to a normal operational mode. This should be done only if a defective smoke detector is discovered. Any smoke detection problem should be corrected as soon as possible.

5. Attendant operated elevators must have both visual and audible signals to alert the attendant to return the car to the designated level when Phase-I Firefighter's Service is activated.

This regulation was modified in the 1984 edition of the elevator code (ASME A17.1) for elevators with dual operation where the conveyance has both ATTENDANT and AUTOMATIC capabilities (except hospital service) as follows:

A visual and audible signal is required, but the elevator should revert to automatic operation in not less than 15 seconds nor more than 60 seconds after Phase-I Firefighter's Service is activated. The car should then return to the designated level.

A BASIC OPERATIONAL TEST OF PHASE-II FIREFIGHTER'S SERVICE

IMPORTANT NOTE: Between 1973 and 1975 a three (3)-position switch in the elevator car was required by code (**ON / OFF / BYPASS**). These switches should not be allowed to exist and when one is found it should be replaced with a two (2)-position switch right away (**ON / OFF**). Use of the **BYPASS** position can allow the elevator to run with the hoistway doors open.

In the 1976 edition of ASME A17.1, the requirement for a three (3)-position switch was changed to a two (2)-position switch (**ON / OFF**)

The ASME A17.1 , 1984 edition, once again required a three (3)-position switch in the elevator car, but this one is maybe switched between (**ON / HOLD /OFF**).

1. Operational test where equipped with a two (2)-position switch (**ON / OFF**).
 - a. With the Phase-I service activated and after the car has returned to the designated (or alternate) level, turn the in-car key switch to the **ON** position. Check to see that the car operates by activating the in-car floor call buttons (car calls can be registered only by floor buttons in the car). The elevator should not respond to any of the hall call buttons. All corridor call button lights and directional lanterns should be inoperable at this time.
 - b. Check the door operation at this point. The door should be controlled by a continuous pressure button or switch and when that button or switch is released prior to the door reaching its fully open position the door should close immediately and automatically.
 - c. Check that a fully opened door can be closed only by registering a car call or by using an in-car Door-Close button (constant pressure).
 - d. Check for a means to cancel car calls.

NOTE: The A17.1 Code, 1985 edition requires a separate **CALL CANCEL** button.

- e. Floor selection buttons must be provided to permit travel to all floors served. Phase-II mode must bypass any floor selection security system (key cards, codes, etc.).
- f. Check to see that door reopening devices sensitive to smoke or flame are inoperative at this stage of testing.

- g. Check to see that Phase-II operation once activated cannot be deactivated even with the switch in the **OFF** position until the car is returned to the designated or alternate level.
- h. With the car on Phase-II at any floor other than the designated level, turn the designated level key-switch to the **OFF** position, or if activated by smoke detectors turn it to **BYPASS**. Make sure that Phase-II remains active until the car is returned to the designated landing.
- i. If standby power is provided for elevators installed under the ASME A17.1, 1983 edition, a manual selection switch must be provided to override automatic sequencing of power. If the switch is key operated it must be keyed the same as the Phase-I / Phase-II switch.

2. Operational test where equipped with a three (3)-position switch (OFF / HOLD / ON)

- a. For a switch with (**OFF / HOLD / ON**) the key must be removable in all three positions.
- b. Operation of Firefighter's service with the switch in the **ON** position is the same as with a two (2)-position switch in the **ON** position. See Item 1, a through f.
- c. Put the car on Phase-II. Remember, the car must be at the designated or alternate level with Phase-I switch **ON** or a smoke detector activated before turning the in-car switch **ON**.

Take the car to an upper level and with the doors open place the in-car switch in the **HOLD** position. The car must remain at the floor and the Door-Close button must be inoperative. Check to see if these conditions exist.

- d. When the in-car switch is in the **OFF** position, and Phase-I is still in effect, the car should revert to Phase-I operation upon closing of the doors. If Phase-I is not in effect when the in-car switch is turned to the **OFF** position, the car should remain at the landing with the doors open and the Door-Close button inoperative. At this point, the elevator is still considered to be on Phase-II.

Elevators shall be considered to be out-of Phase-II mode when:

- (i) Phase-II switch is in the **OFF** position and the car is at the designated level with door in the normal open position; or,
- (ii) Phase-II switch is in the **OFF** position while Phase-I is in effect.

These instructions and details are general in nature and may not cover all aspects of Firefighter's Service for every type of elevator.

NOTE: "Shunt-trip" configurations may vary greatly from building to building. Building Owners should check with their regular elevator maintenance company to see if their conveyances are equipped with "shunt-trip" controls. In any case, smoke detectors alone are not permitted to remove power to an elevator.

NOTE: There is no requirement to test a "shunt trip" except upon initial acceptance inspection of a new conveyance.

This form is to be used in conjunction with pages 8 through 12, "A Basic Operational Test of Phases-I and -II, Firefighter's Service."

FORM FFS-1

Firefighter's Service Evaluation Form

**A BASIC OPERATIONAL TEST OF
ELEVATOR'S FIREFIGHTER'S SERVICE**

**A BASIC OPERATIONAL TEST OF:
PHASE-I FIREFIGHTER'S SERVICE**

I. A three (3)-position switch must be provided at the main floor (ON / OFF / BYPASS).

Comment: _____

1. When the switch is turned to the **ON** position, all automatic cars must return to the main floor and park with the doors open.
- Exception:** High-Rise Buildings constructed under Houston's high-rise code between the years 1979 and 1997 would have the doors open for a predetermined time and then close. The doors could be opened with a button in the fire command station, or from inside the car.

Comment: _____

2. Turn the in-car key switch **OFF** with the car at the designated landing. With the inspector in the car, register several floor calls and allow the car to run. As the car leaves the floor, turn the main (designated landing) floor key-switch to the **ON** position. The car must stop and reverse at or below the next available floor without opening its doors and then return to the designated landing. The "emergency stop" switch should be automatically rendered inoperative during this return phase of operation.

While the car is descending, operate the "emergency stop" switch to see that it has been rendered inoperative. Also, Check to see that the car will not respond to any car calls, and that all registered lights and lanterns have extinguished and remain inoperative.

Comment: _____

3. With the main floor key switch in the **OFF** position, run the car to any floor. With the doors open have the main floor key switch turned to the **ON** position. Check to see if the door reopening devices are inoperative at this point. These are the devices that are sensitive to smoke, heat and flames. The mechanical safety edge of the door should remain operative, however.

With the doors in the open position, activate the "emergency stop" switch. It should be operative at this point (the doors may or may not close at this time, but the car should not move with the "emergency stop" switch activated).

Comment: _____

4. Return the emergency stop switch to the **RUN** position. The doors should close without delay and the car should proceed to the designated landing as described in #2 above.

NOTES: Use of the **BYPASS** position on the designated level key-switch will cause smoke detectors in

each elevator lobby and associated machine rooms to be deactivated or “bypassed”, and cause the elevator to return to a normal operational mode. This should be done only if a defective smoke detector is discovered. Any smoke detection problem should be corrected as soon as possible.

Comment: _____

5. Attendant operated elevators must have both visual and audible signals to alert the attendant to return the car to the designated level when Phase-I Firefighter’s Service is activated.

This regulation was modified in the 1984 edition of the elevator code (ASME A17.1) for elevators with dual operation where the conveyance has both ATTENDANT and AUTOMATIC capabilities (except hospital service) as follows:

A visual and audible signal is required, but the elevator should revert to automatic operation in not less than 15 seconds nor more than 60 seconds after Phase I -Firefighter’s Service is activated. The car should then return to the designated landing.

Comment: _____

**A BASIC OPERATIONAL TEST OF:
PHASE-II FIREFIGHTER’S SERVICE:**

IMPORTANT NOTE: Between 1973 and 1975 a three (3)-position switch in the elevator car was required by code (**ON / OFF / BYPASS**). These switches should not be allowed to exist and when one is found it should be replaced with a two (2)-position switch right away (**ON / OFF**). Use of the **BYPASS** position can allow the elevator to run with the hoistway doors open.

In the 1976 edition of ASME A17.1, the requirement for a three (3)-position switch was changed to a two (2)-position switch (**ON / OFF**)

The ASME A17.1 , 1984 edition once again required a three (3)-position switch in the elevator car, but this one is switchable between (**ON / HOLD / OFF**).

1. Operational test where equipped with a two (2)-position switch (ON / OFF).

- a. With the phase-I service activated and after the car has returned to the designated (or alternate) level, turn the in-car key switch to the **ON** position. Check to see that the car operates by activating the in-car floor call buttons (car calls can be registered only by floor buttons in the car). The elevator should not respond to any of the hall call buttons. All corridor call button lights and directional lanterns should be inoperable at this time.

Comment: _____

- b. Check the door operation at this point. The door should be controlled by a continuous pressure button or switch and when that button or switch is released prior to the door reaching its fully open position the door should close immediately and automatically.

Comment: _____

- c. Check that a fully opened door can be closed only by registering a car call or by using an in-car door close button (constant pressure).

Comment: _____

- d. Check for a means to cancel car calls.

NOTE: The A17.1 Code, 1985 edition requires a separate **CALL CANCEL** button.

Comment: _____

-
- e. Floor selection buttons must be provided to permit travel to all floors served. Phase-II mode must bypass any floor selection security system (key cards, codes, etc.).

Comment: _____

-
- f. Check to see that door reopening devices sensitive to smoke or flame are inoperative at this stage of testing.

Comment: _____

-
- g. Check to see that Phase-II operation once activated cannot be deactivated even with the switch in the **OFF** position until the car is returned to the designated or alternate landing.

Comment: _____

-
- h. With the car on Phase-II at any floor other than the designated landing, turn the main floor key switch to the **OFF** position, or if activated by smoke detectors turn it to **BYPASS**. Make sure that Phase-II remains active until the car is returned to the main floor.

Comment: _____

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- i. If standby power is provided for elevators installed under the ASME A17.1, 1983 edition, a manual selection switch must be provided to override automatic sequencing of power. If the switch is key operated it must be keyed the same as the Phase-I / Phase-II switch.

Comment: _____

2. Operational test where equipped with a three (3)-position switch (**OFF / HOLD / ON**)

- a. For a switch with (**OFF / HOLD / ON**) the key must be removable in all three positions.

Comment: _____

-
- b. Operation of Firefighter's service with the switch in the **ON** position is the same as with a two (2)-position switch in the **ON** position. See Item 1, a through f.

Comment: _____

-
- c. Put the car on Phase-II. Remember, the car must be at the designated or alternate level with Phase-I switch **ON** or a smoke detector activated before turning the in-car switch **ON**.

Take the car to an upper level and with the doors open place the in-car switch in the **HOLD** position. The car must remain at the floor and the door close button must be inoperative. Check to see if these conditions exist.

Comment: _____

- d. When the in-car switch is in the **OFF** position, and Phase-I is still in effect, the car should revert to Phase-I operation upon closing of the doors. If Phase-I is not in effect when the in-car switch is turned to the **OFF**

