Your building security is notified that several people are trapped in one of the building elevators. One of the trapped passengers is panicking and is in need of medical attention. Will your security and facility management staff know what to do?

Introduction

With vertical growth due to urbanization, elevators became an important mode of transportation for high and mid rise buildings. Although accurate statistics about the number of elevators in use across the country or the number of people using elevators is not published, hundreds of thousands of people are estimated to ride in elevators every day. While most rides are uneventful, occasional reports of elevator entrapments and rescues grab our attention.

Whether it is a public or private building or a residential, commercial or a hospital building, the building owner or the facility building management is responsible for managing the operations for rescue of trapped passengers in the elevator. Elevator entrapment and rescue operations are complex and hazardous operations that require emergency procedures and use of trained personnel. Whether these rescues are carried out by building staff with appropriate training, elevator service company or by the emergency personnel from the fire department, all building owners and facility management operations should have a documented elevator entrapment rescue program available on premises.

Discussion

Entrapments—Modern elevators that are well maintained have an expected life span of 20-30 years with about 20 years as an average for replacement. Elevator stalls and passenger entrapment can occur for a variety of reasons. A well maintained elevator is less likely to stall than a poorly maintained one. Some of the potential causes of elevator stalls are:

- Loss of building electric power
- Electric or mechanical malfunction or breakdowns
- Passenger misuse or abuse, tampering
- Overloading

Program requirements—Elevator operations are governed by American Society of Mechanical Engineers (ASME) A17.1 code. While some jurisdictions may adopt and enforce it as a mandatory regulation for the local jurisdiction, many jurisdictions use this code as a guideline. Section ASME A17.1/CSA B44-2010, 8.6.10.4 requires a building owner and managers to have a written procedure for emergency evacuation and rescue of trapped passengers from a stalled elevator.

ASME has developed and published ASME A17.4 “Guide for emergency personnel” that also includes Evacuation Procedures and Firefighters’ Service Operating Procedures.
The ASME A17.4 guideline recommends that any evacuation of passengers trapped in a stalled elevator should be performed under the direct supervision of elevator personnel. Only in the event of an emergency or when waiting for arrival of elevator personnel may not be practical, rescue can be carried out by other personnel who are carefully selected and trained as described in the ASME guide.

Many jurisdictions require annual safety inspections as part of building occupancy requirements and the inspection certificate may be posted in the elevator or must be available on the premises. Although a state or a local jurisdiction may not have adopted the emergency evacuation and rescue requirements of ASME code for enforcement, it would be important for a building owner or the facility management company to comply with them as part of prudent risk management program. Some jurisdictions do not permit building personnel to attempt any elevator rescue operations but rather require an elevator contractor on retainer for responding to elevator emergencies.

**Guidance**

**Rescue program elements** - Due to unique aspects of each building (e.g., number of stories, type of elevator, residential/commercial building and tenants) and elevator operations (e.g. hours of operations, self-service), procedures may have to be specific to each elevator or building. Some of the important considerations are:

- Written procedures available on premises
- Regular frequency and contract for elevator maintenance
- Periodic testing of emergency alarm bell and elevator phone
- Training of building personnel for response and rescue, including refresher training as appropriate
- Availability and maintenance of required rescue equipment and related supplies
- Situation assessment and incident documentation
- Communication with trapped passengers in the elevator, rescue procedures for after-hour and weekend emergencies
- Notification of entrapment to elevator service contractor, fire department and other authorities

In addition to written procedures, ensure that elevator access key and emergency phone numbers for elevator contractor personnel are available. Even if the rescue is going to be carried out by elevator contractor personnel, the building personnel should establish and maintain direct communication contact by available means with trapped passengers to ascertain their safety, instruct them to stay calm and perform an initial assessment of the situation. This may include emergency situations requiring immediate medical attention, elevator number and location of the stall and any other issues that require immediate attention.

Examples of rescue equipment may include ladders, flashlights, elevator door unlocking key, safety belts, life line and two-way radios, etc.

**Safety issues affecting the trapped passengers** - Safety of trapped passengers is of paramount importance. Building security personnel may be notified of a stalled elevator by emergency alarm bell, by emergency phone located in the elevator car, by cell phone or by calling for help. In addition to emergency phone, emergency instructions may also be posted in the elevator car and also included as part of orientation for all building occupants and tenants. The emergency instructions should stress that the trapped passengers do not attempt to evacuate or exit themselves by climbing out, jumping or prying open the door or escaping through the ceiling. This can lead to additional emergencies and possible injuries. Some people fear getting trapped in an elevator and may have a panic attack requiring medical attention. There may be other potential medical emergencies, such as a pregnancy or a cardiac emergency. For these and a variety of other reasons, establishing and maintaining direct communication with trapped passengers is an important part of rescue operations. The communication should be maintained to reassure the trapped passengers until the rescue operations are complete. If any medical or other emergency situations are present, notify appropriate emergency responders promptly with necessary details.

**Safety issues affecting rescue personnel** - Elevator rescue operations are complex and hazardous operations that require emergency procedures and use of trained personnel. Before attempting the rescue, an assessment of situation should be completed to determine the safety of trapped passengers and options for attempting the rescue. Location of the elevator stall determines the complexity of rescue. Initial assessment should determine if the elevator is stalled at or near a landing, less than three feet, or more than three feet from landing or in-between floors. Most complex rescue operations are best left up to an elevator service contractor or the fire department rescue personnel. Some jurisdictions mandate that all elevator rescue operations be carried out by a contractor or fire department. Only in case of emergency, some jurisdictions may permit building personnel, who have received appropriate rescue training, to attempt to rescue trapped passengers from an elevator that is stalled less than three feet from the landing.
In order to ensure that the equipment is at zero energy state, implement a lockout-tagout procedure to disconnect mainline electric power to the elevator. This minimizes unexpected movement of the car due to release of stored energy or electric shock to rescue personnel. In addition to electric power and machinery related hazards, working at heights and in tight spaces are some of the hazards that require careful attention of rescue personnel. Attempting to retrieve keys, cell phones or other valuables falling through the gap can present serious risk of injuries to rescue personnel.

Other safety considerations - Elevators with jerky movements or cars not stopping level with floor landing may be an indication of potential malfunction that requires prompt attention of building and elevator maintenance personnel. Cars not stopping level with the floor landing may also result in a serious tripping hazard and resulting injuries can be a source of liability. Elevator cars should be inspected periodically for properly functioning of emergency lights, alarm bell and emergency telephone.

Conclusion

Although elevator emergencies requiring evacuation and rescue of trapped passengers are rare compared to the great number of passengers riding in building elevators across the country, these incidents can be serious, resulting in injuries to passengers and rescue personnel. They can also result in adverse publicity in the media, or expensive litigation. All rescue incidents should be documented and logged with any witness statements as necessary.

Whether required by local regulations or not, it would be important for a building owner or the facility management company to implement the emergency evacuation and rescue requirements of ASME code for enforcement, as part of a prudent risk management program.

References

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