

## Risk Assessment

### ➤ **Background**

An emergency is defined as a situation or an impending situation caused by the forces of nature, an accident, an intentional act or otherwise that constitutes a danger of major proportions to life or property.

Numerous events can be "emergencies," including:

- Fire/explosion
- Hazardous materials incident
- Flood or flash flood
- Severe weather (hurricane, tornado, winter storm)
- Earthquake
- Criminal activity
- Air plane crash

### ➤ **Descriptions of the Emergency and Mitigation Measures**

- **Fire**

Buildings are designed and constructed to confine and control a fire to allow building occupants time to evacuate. Buildings are also designed to allow fire department personnel time to access and gain control over the fire. Buildings are designed for the expected fire loads they will encounter during their lifespan. Bombs, terrorist may exceed these expectations and subject the building to fire loads for which they were not designed. For example, a building designed to maintain its structural stability for three hours, may fail in a much shorter period of time under these adverse conditions.

Equipment and procedures dealing with egress and exit facilities, fire alarm systems, voice communication systems, fire suppression systems and other life safety devices and features will play a major role in enhancing occupant safety in the event of a fire and/or explosion. Property owners and managers must ensure that these life safety features are maintained in operable condition and ready for use at all times. All the buildings must have the approved fire safety plan which includes the following:

- a) The emergency procedures to be used in case of fire including sounding the fire alarm, notifying the fire department, provisions for access for fire fighting, instructing occupants on procedures to be followed when the fire alarm sounds, evacuating endangered occupants and confining, controlling and extinguishing the fire.
- b) The appointment and organization of designated supervisory staff to carry out fire safety duties.
- c) The instruction of supervisory staff and other occupants so that they are aware of their responsibilities for fire safety.
- d) The holding of fire drills including the emergency procedures appropriate to the building,
- e) The control of fire hazards in the building,
- f) The maintenance of building facilities provided for the safety of occupants,

- g) The provision of alternative measures for the safety of occupants during any shutdown of fire protection equipment and systems or part thereof.
- h) Instructions, including schematic diagrams, describing the type, location and operation of building fire emergency systems.

Property management should, at a minimum, develop and introduce emergency fire procedures for occupants and key property personnel to follow in the event of fire.

- **Bomb Threats**

Bomb threats are usually made by telephone. Few of these threats are real. Bombers that go to the trouble of manufacturing and placing a device typically will not call in a warning.

Bombers usually prefer to place devices in easily accessible locations (e.g., outside of buildings, lobbies, near exits) to minimize risk of capture. Evacuating a building without first checking these common areas may put occupants at increased risk. Bombers have used telephone threats to herd people towards a device.

Good housekeeping simplifies the task of identifying suspicious packages. Security measures make it more difficult to plant a bomb. Locking cabinets, rooms, offices, etc. also limits unauthorized access and reduces the areas that need to be searched.

Building owners and managers should consider the following in establishing procedures for this type of threat:

**Type of Evacuation:**

There are three options available depending on the situation:

- o Complete evacuation of the premises
- o Partial evacuation to a safe outside area or another internal area
- o No evacuation

**Emergency Controller:**

If sufficient warning has been provided, the building owner, building manager or other senior designated individual should make the decision whether or not to evacuate. It is important that the primary manager and alternates responsible for this decision are recognized by the occupants as having the authority to make these important decisions. Their decision may be made with advice from the police, fire department or other knowledgeable persons. Public safety should always be the foremost consideration.

**Blast-Resistant Precautions**

The design and construction of high-risk buildings to provide life safety in the face of explosions is receiving renewed attention. Steps for reducing the impact of an explosion can include introducing enhancements in structural design coupled with a buffer zone surrounding the building.

- **Criminal Activity**

Emergencies arising from human activity can include situations instigated by an intentional criminal, human error or situations resulting from large-scale industrial accidents.

Criminal acts such as bomb threats have historically been one of the most common types of threats. However, recent public concern has also focused on threats associated with biological and chemical agents.

Accidents that occur in industrial facilities may place neighboring property and lives at risk. Of particular concern are accidents that involve facilities that store large quantities of toxic chemicals.

The building occupants' roles and responsibilities should always be fixed. Regardless of whether or not they have been delegated any formal responsibilities; occupants play an integral part in effectively executing the Emergency Plan and ensuring their own personal safety. Their role is particularly important in buildings where delegated emergency personnel are not available 24 hours a day, 7 days a week.

Usually in these types of situations, local authorities will likely be involved in responding to, and/or monitoring the emergency situation. Where applicable, building management should consult with authorities to determine an appropriate course of action. However, in some situations, a decision to evacuate may have to be made by building management on their own without the opportunity for consultation.

When circumstances warrant an evacuation, the building occupants must be notified in an appropriate manner, taking into consideration the serious nature and urgency of the situation.

Well-planned and prearranged lockdown procedures may be appropriate for application in occupancies such as schools to protect students and staff. The lockdown practices and procedures should never interfere with the occupants' abilities to evacuate promptly should the circumstances warrant it.

Security personnel, receptionists, complaints department personnel or other employees who are in a position where they may have to deal with violent or potentially violent people should be given training on conflict resolution and work place violence.

- **Hazardous Material Accident**

A hazardous materials accident can occur anywhere. Buildings located near chemical manufacturing plants are particularly at risk. However, hazardous materials are transported on our roadways, railways and waterways daily, so any area is considered vulnerable to an accident.

Building management should maintain a current inventory of hazardous materials used on-site including current Material Safety Data Sheets (MSDS). Appropriate spill control and clean-up materials and equipment should be readily available.

Staff should be trained in spill clean-up procedures. Emergency phone numbers for hazardous materials disposal companies should also be available. If possible, managers should determine what hazardous materials might be present on neighboring properties. A risk assessment of this exposure should also be carried out.

**Action to be taken in this kind of Emergency:**

- Call the local fire department to report the nature and location of the accident as soon as possible.
- Keep building occupants away from the accident scene.
- Do not walk into, touch, smell or taste any of the spilled substance. Try not to inhale gases, fumes and smoke. If possible, cover mouth with a cloth while leaving the area.
- Try to stay away from accident victims until the hazardous material has been identified.
- Try to stay upstream, uphill and upwind of the accident with clear access to an evacuation route.

- **Emergency Due to Natural Disaster**

Emergencies due to sudden and powerful natural events are capable of inflicting considerable damage to property and placing many lives at risk. These types of emergencies generally result from severe weather conditions or earthquakes. Subsequent flash floods that may follow can result in further property damage and risk to lives.

**Earthquake:**

Building management should:

- Warn occupants to expect that the fire alarms and sprinklers will go off during an earthquake.
- Instruct occupants that it is very dangerous to try to leave a building during an earthquake because objects can fall on occupants. Many fatalities occur when people run outside of buildings, only to be killed by falling debris from collapsing walls and

broken glass. Occupants are generally safer to stay where they are until the earthquake is over.

- Evacuate occupants once the shaking has stopped. Occupants should be evacuated using the stairs and moved quickly away from the building to prevent injury from falling debris.
- Call emergency services, as appropriate, and then give first aid as necessary. Do not try to move seriously injured people unless they are in immediate danger of further injury.
- Put out small fires quickly if this can be done without endangering personnel. This will prevent fires from spreading until firefighting resources become available. Fire is the most common hazard following earthquakes.
- Clean up flammable liquid spills immediately.
- Expect aftershocks.
- Warn occupants of fallen power lines and other hazards.
- Arrange for qualified people to inspect the building for damage that may have occurred.

#### **Severe Storms:**

Thunderstorms, tornadoes, hail, blizzards, ice storms, high winds and heavy rain can develop quickly and hit hard, posing a threat to life and property. Some problems cannot be prevented. High winds will topple trees and heavy rains will cause rivers to flood. But some damage can be avoided or at least reduced, if precautionary measures are taken, such as knowing the type of storms common to your area and what time of year they are likely to strike.

Storms often strike too quickly to allow management to provide instructions to occupants at the time they occur. Occupants must be instructed as to correct procedures in advance. For example, storms that are accompanied by high winds would require occupants to retreat to interior spaces away from windows.

Management should be aware that electrical power might be unavailable for an extended period of time. Therefore, backup generators and adequate fuel supplies may be very helpful in maintaining essential building services (e.g., heating). After a severe storm, it may be necessary to obtain the services of qualified personnel to inspect the building for damage that may not be readily identified.

#### **Floods:**

Building management should assess the threat of flooding to their building. Usually this is easily accomplished due to a history of similar earlier events. Alternatively, they can contact the local municipal planning office for flood information. Many insurance companies also have information on the potential for flooding in specified areas.

Building management may wish to consider the following:

- Providing pumps, generators, sandbags, etc., for temporary flood relief.
- Providing permanent breakwaters and dikes where the flood potential is high.

- Evaluate the potential impact on ground level and underground tanks.
- Hazardous materials stored at or below grade moved to a safe location.
- Protection of drinking water sources.
- Impact of floodwater on high value and process equipment.
- Electrical hazards that may be created due to the presence of water (to both permanent and temporary wiring).
- Affect of flooding on the structural integrity of the building.
- Retain a list of qualified personnel and contractors who can be contacted to assess and repair flood damage.
- Arrange to have drinking water tested after a flood. This is particularly important in areas where drinking water is obtained from wells.

### ➤ **Airplane Crash**

Buildings may experience roof collapse resulting from airplane crash. Building owners and property managers should be aware of the potential for roof failure resulting from this effect. The property management should consult with a professional engineer and /or architect to assist in analyzing the integrity of the existing structure.

Based upon information of this nature, tolerable and un-tolerable conditions can be identified. Procedures can be adopted that would identify conditions when unsafe loads may be experienced and incorporate safe practices.

When intolerable conditions are expected or imminent, evacuation may be appropriate.

### ➤ **Training, Drill and Exercise Considerations**

In addition to the training, individuals have key roles to play during an emergency. Everyone working in the facility will require some form of training to become familiar with the established Emergency Plans. This could include distribution of the specific procedures to each employee and occupant/tenant, periodic discussion sessions with occupants and tenants to review the procedures, technical training in the use of special equipment if necessary and participation in evacuation drills intended to improve awareness of the egress features provided in the building.

In addition to conducting fire drills at the frequency required, it is also necessary to periodically assess the other types emergency procedures similarly through exercises or drills.

The purpose of conducting drills and exercises is to:

- Assess the ongoing effectiveness of the facility's emergency procedures given different scenarios and make corrections where necessary;
- Determine that sufficient adequately trained people are available to respond and carry out the activities outlined in the emergency procedures;
- Ensure that the building occupants understand how to react in accordance with the building's emergency response and evacuation procedures; and
- Provide an opportunity for emergency response training and practice.