Fire safety

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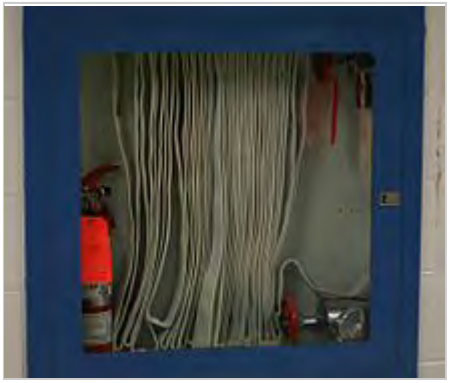
Fire safety is the set of practices intended to reduce the destruction caused by fire. Fire safety measures include those that are intended to prevent ignition of an uncontrolled fire, and those that are used to limit the development and effects of a fire after it starts.



A fire safety station at a high school. Fire hoses built into a structure can sometimes be used by occupants to mitigate fires while the fire department is responding.

Fire safety measures include those that are planned during the construction of a building or implemented in structures that are already standing, and those that are taught to occupants of the building.

Threats to fire safety are commonly referred to as *fire hazards*. A fire hazard may include a situation that increases the likelihood of a fire or may impede escape in the event a fire occurs.

Fire safety is often a component of building safety. Those who inspect buildings for violations of the Fire Code and go into schools to educate children on Fire Safety topics are fire department members known as *Fire Prevention Officers*. The Chief Fire Prevention Officer or Chief of Fire Prevention will normally train newcomers to the Fire Prevention Division and may also conduct inspections or make presentations.

Contents

Elements of a fire safety policy

- Building a facility in accordance with the version of the local building code
- Maintaining a facility and conducting oneself in accordance with the provisions of the fire code. This is based on the occupants and operators of the building being aware of the applicable regulations and advice.

Examples of these include:

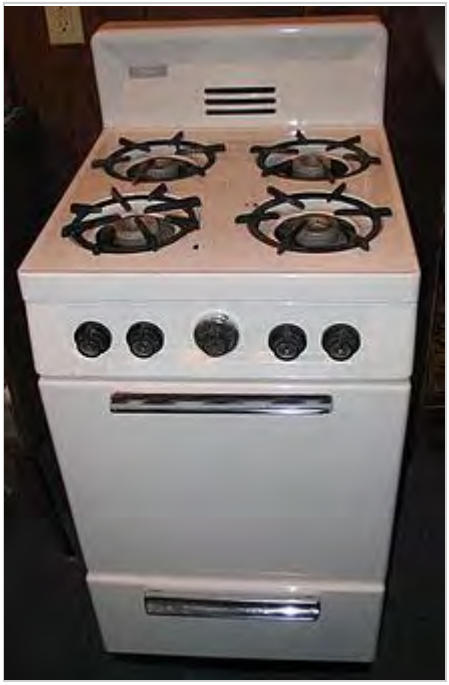
- Not exceeding the maximum occupancy within any part of the building.
- Maintaining proper fire exits and proper exit signage (e.g., exit signs pointing to them that can function in a power failure)
- Compliance with electrical codes to prevent overheating and ignition from electrical faults or problems such as poor wire insulation or overloading wiring, conductors, or other fixtures with more electric current than they are rated for.
- Placing and maintaining the correct type of fire extinguishers in easily accessible places.
- Properly storing and using, hazardous materials that may be needed inside the building for storage or operational requirements (such as solvents in spray booths).
- Prohibiting flammable materials in certain areas of the facility.
- Periodically inspecting buildings for violations, issuing Orders To Comply and, potentially, prosecuting or closing buildings that are not in compliance, until the deficiencies are corrected or condemning it in extreme cases.
- Maintaining fire alarm systems for detection and warning of fire.
- Obtaining and maintaining a complete inventory of firestops.
- Ensuring that spray fireproofing remains undamaged.
- Maintaining a high level of training and awareness of occupants and users of the building to avoid obvious mistakes, such as the propping open of fire doors.
- Conducting fire drills at regular intervals throughout the year.

Common fire hazards

Some common fire hazards are:[1]

- Kitchen fires from unattended cooking, such as frying, broiling, and simmering
- Electrical systems that are overloaded, resulting in hot wiring or connections, or failed components
- Combustible storage areas with insufficient protection
- Combustibles near equipment that generates heat, flame, or sparks
- Candles and other open flames
- Smoking (Cigarettes, cigars, pipes, lighters, etc.)
- Equipment that generates heat and utilizes combustible materials
- Flammable liquids and aerosols
- Flammable solvents (and rags soaked with solvent) placed in enclosed trash cans
- Fireplace chimneys not properly or regularly cleaned
- Cooking appliances - stoves, ovens
- Heating appliances - fireplaces, wood burning stoves, furnaces, boilers, portable heaters

- Household appliances - clothes dryers, curling irons, hair dryers, refrigerators, freezers
- Chimneys that concentrate creosote
- Electrical wiring in poor condition
- Leaking Batteries
- Personal ignition sources - matches, lighters
- Electronic and electrical equipment
- Exterior cooking equipment - barbecue



Improper use and maintenance of gas stoves often create fire hazards.

Fire code

In the United States, the **fire code** (also **fire prevention code** or **fire safety code**) is a model code adopted by the state or local jurisdiction and enforced by fire prevention officers within municipal fire departments. It is a set of rules prescribing minimum requirements to prevent fire and explosion hazards arising from storage, handling, or use of dangerous materials, or from other specific hazardous conditions. It complements the building code. The fire code is aimed primarily at preventing fires, ensuring that necessary training and equipment will be on hand, and that the original design basis of the building, including the basic plan set out by the architect, is not compromised. The fire code also addresses inspection and maintenance requirements of various fire protection equipment in order to maintain optimal active fire protection and passive fire protection measures.

A typical fire safety code includes administrative sections about the rule-making and enforcement process, and substantive sections dealing with fire suppression equipment, particular hazards such as containers and transportation for combustible materials, and specific rules for hazardous occupancies, industrial processes, and exhibitions.

Sections may establish the requirements for obtaining permits and specific precautions required to remain in compliance with a permit. For example, a fireworks exhibition may require an application to be filed by a licensed pyrotechnician, providing the information necessary for the issuing authority to determine whether safety requirements can be met. Once a permit is issued, the same authority (or another delegated authority) may inspect the site and monitor safety during the exhibition, with the power to halt operations, when unapproved practices are seen or when unforeseen hazards arise.

List of some typical fire and explosion issues in a fire code

- Fireworks, explosives, mortars and cannons, model rockets (licenses for manufacture, storage, transportation, sale, use)
- Certification for servicing, placement, and inspecting fire extinguishing equipment
- General storage and handling of flammable liquids, solids, gases (tanks, personnel training, markings, equipment)
- Limitations on locations and quantities of flammables (e.g., 10 liters of gasoline inside a residential dwelling)

- Specific uses and specific flammables (e.g., dry cleaning, gasoline distribution, explosive dusts, pesticides, space heaters, plastics manufacturing)
- Permits and limitations in various building occupancies (assembly hall, hospital, school, theater, elderly care, child care, prs that require a smoke detector, sprinkler system, fire extinguisher, or other specific equipment or procedures
- Removal of interior and exterior obstructions to emergency exits or firefighters and removal of hazardous materials
- Permits and limitations in special outdoor applications (tents, asphalt kettles, bonfires, etc.)
- Other hazards (flammable decorations, welding, smoking, bulk matches, tire yards)
- Electrical safety codes such as the National Electrical Code (by the National Fire Protection Association) for the U.S. and some other places in the Americas
- Fuel gas code

Public fire safety education

Most U.S. fire departments have fire safety education programs.

Fire prevention programs may include distribution of smoke detectors, visiting schools to review key topics with the students and implementing nationally recognized programs such as NFPAS "Risk Watch" and "Learn not to burn".[2]

Other programs or props can be purchased by fire departments or community organizations. These are usually entertaining and designed to capture children's attention and relay important messages. Props include those that are mostly auditory, such as puppets and robots. The prop is visually stimulating but the safety message is only transmitted orally. Other props are more elaborate, access more senses and increase the learning factor. They mix audio messages and visual cues with hands-on interaction. Examples of these include mobile trailer safety houses and tabletop hazard house simulators. Some fire prevention software is also being developed to identify hazards in a home.[3]

All programs tend to mix messages of general injury prevention, safety, fire prevention, and escape in case of fire. In most cases the fire department representative is regarded as the expert and is expected to present information in a manner that is appropriate for each age group.

Fire educator qualifications

The US industry standard that outlines the recommended qualifications for fire safety educators is NFPA 1035: Standard for Professional Qualifications for Public Fire and Life Safety Educator, which includes the requirements for Fire and Life Safety Educator Levels I, II, and III; Public Information Officer; and Juvenile Firesetter Intervention Specialist Levels I and II.

Target audiences

According to the United States Fire Administration, the very young and the elderly are considered to be "at risk" populations. These groups represent approximately 33% of the population.

Fire safety plan

A **fire safety plan** is required by all North American national, state and provincial fire codes based on building use or occupancy types. Generally, the owner of the building is responsible for the preparation of a fire safety plan. Buildings with elaborate emergency systems may require the assistance of a fire protection consultant. After the plan has been prepared, it must be submitted to the Chief Fire Official or authority having jurisdiction for approval. Once approved, the owner is responsible for implementing the fire safety plan and training all staff in their duties. It is also the owner's responsibility to ensure that all visitors and staff are informed of what to do in case of fire. During a fire emergency, a copy of the approved fire safety plan must be available for the responding fire department's use.[4]

Fire safety plan structure

- Key contact information
- Utility services (Including shut-off valves for water, gas and electric)
- Access issues
- Dangerous stored materials
- Location of people with special needs
- Connections to sprinkler system
- Layout, drawing, and site plan of building
- Maintenance schedules for life safety systems
- Personnel training and fire drill procedure
- Create safe haven (zone)

Use of fire safety plans

Fire safety plans are a useful tool for fire fighters to have because they allow them to know critical information about a building that they may have to go into. Using this, fire fighters can locate and avoid potential dangers such as hazardous material (hazmat) storage areas and flammable chemicals.
In addition to this, fire safety plans can also provide specialized information that, in the case of a hospital fire, can provide information about the location of things like the nuclear medicine ward.[5] In addition to this, fire safety plans also greatly improve the safety of fire fighters. According to FEMA, 16 percent of all fire fighter deaths in 2002 occurred due to a structural collapse or because the fire fighter got lost.[6] Fire safety plans can outline any possible structural hazards, as well as give the fire fighter knowledge of where he is in the building.

Fire safety plans in the fire code

In North America alone, there are around 8 million buildings that legally require a fire safety plan, be it due to provincial or state law.[7] Not having a fire safety plan for buildings which fit the fire code occupancy type can result in a fine, and they are required for all buildings, such as commercial, industrial, assembly, etc.

Advances in fire safety planning

As previously stated, a copy of the approved fire safety plan shall be available for the responding fire department. This, however, is not always the case. Up until now, all fire plans were stored in paper form in the fire department. The problem with this is that sorting and storing these plans is a challenge, and it is difficult for people to update their fire plans. As a result, only half of the required buildings have fire plans, and of those, only around 10 percent are up-to-date.[7] This problem has been solved through the introduction of digital fire plans. These fire plans are stored in a database and can be accessed wirelessly on site by firefighters and are much simpler for building owners to update.

See also

- Ablation
- Endothermic
- Fire Equipment Manufacturers' Association
- Fire sprinkler
- Fire-adapted communities
- Firestop pillow
- Firework Code
- Intumescent
- List of fires
- Listing and approval use and compliance
- Product certification
- Safety Centre

References

1. "Fire Safety". Fire Protection Specialists. Retrieved 17 January 2014.
2. NFPA eLearning On-line catalog (http://www.nfpa.org/itemDetail.asp?categoryID=213&itemID=17658&URL=Learning/Training%20and%20professional%20development/Online%20learning)
3. Fire prevention software (http://ngm.nationalgeographic.com/2011/09/visions-now-next#/next/1)
4. "Fire Safety Plans". New York City Fire Department. Retrieved 17 January 2014.
5. American, Jerry, “Fire Safety Disaster.” Canadian Healthcare Facilities Volume 28 Issue 3, ed Amie Silverwood. Spring 2008, 26.
6. Fire Fighter Fatalities in the U.S. in 2002. Fema, U.S. Department of Homeland Security, July 2003
7. “Canadian firm generates digital fire safety plans.” Building Strategies, ed. Susan Maclean. Spring 2007, 14

External links

- Sample Fire Code Table of Contents from International Code Council (http://www2.iccsafe.org/states/Seattle/seattle_fire/PDFs/Table%20of%20contents.pdf)