Part II—General Safety Provisions

Chapter 3: General Requirements

General Comments

Fire is always a concern, whether a building is under construction, is occupied for normal use or is undergoing renovation, restoration, expansion or demolition. But careful planning combined with common sense can make buildings and premises much safer, regardless of the occupancy or other activities at the site.

The primary focus of the requirements in this chapter is making sure the three elements necessary for a fire—ignition source, fuel and oxygen—do not come in contact with one another. NFPA 550 describes in great detail the features of fire safety systems and includes a logic tree called "The Fire Safety Concepts Tree" to graphically show all the possible means of achieving user-defined fire safety objectives. A portion of that tree is reproduced here as Figure 3 to show how to avoid fire ignition. Activities on this diagram that follow a plus sign (+), also known as an "or" gate, may be undertaken independently of each other to arrive at the desired goal. Alternatives following a dot (·), also known as an "and" gate, must be combined to achieve the desired result.

Figure 3 shows that eliminating any one of the three elements required for a fire to occur will prevent one from happening. If there is no ignition source, a fuel load of any size should not catch fire. If there is no fuel load, there is nothing for an ignition source to ignite. Lastly, if there is little or no air available to sustain combustion, any fire ignited in a fuel load will quickly die.

The requirements and precautions outlined in this chapter, when applied using good judgment and the common sense mentioned above, will help to foster safety for everyone.

Purpose

The requirements and precautions contained in this chapter are intended to improve premises safety for everyone, including construction workers, tenants, operations and maintenance personnel and emergency response personnel.

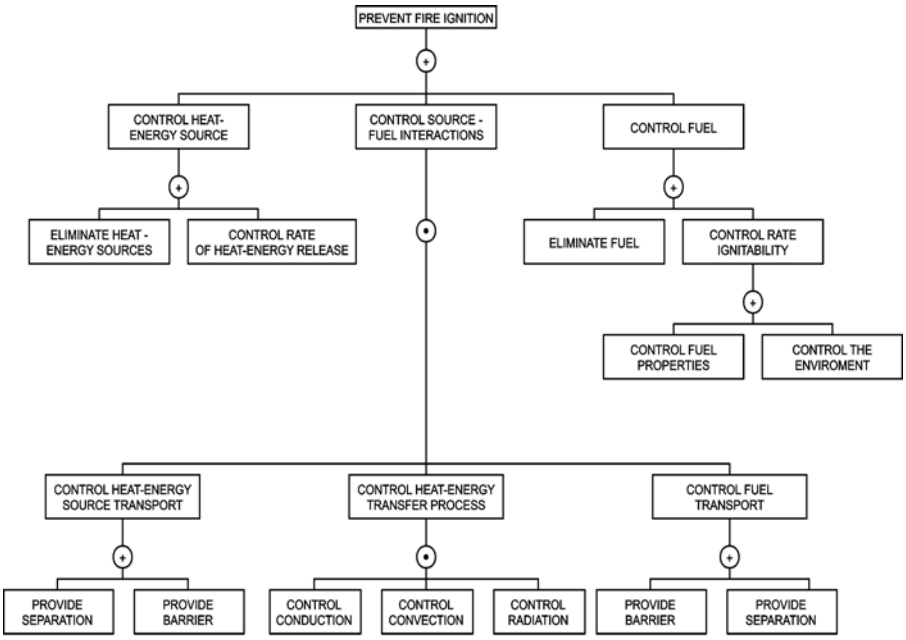

Figure 3
THE FIRE SAFETY CONCEPTS TREE

SECTION 301
GENERAL

301.1 Scope. The provisions of this chapter shall govern the occupancy and maintenance of all structures and premises for precautions against fire and the spread of fire and general requirements of fire safety.

❖ The requirements of Chapter 3 prescribe fire safety precautions for conditions that are likely to cause or contribute to the spread of fire in any building or structure or on any premises, regardless of occupancy.

301.2 Permits. Permits shall be required as set forth in Section 105.6 for the activities or uses regulated by Sections 306, 307, 308 and 315.

❖ Issuing permits gives the fire code official an opportunity to carefully evaluate and regulate hazardous operations. Applicants for permits should be required to demonstrate that their operations comply with the intent of the code before the permit is issued. See the commentary to Section 105.6 for a general discussion of operations requiring an operational permit.

SECTION 302
DEFINITIONS

302.1 Definitions. The following terms are defined in Chapter 2:

BONFIRE.

HI-BOY.

HIGH-VOLTAGE TRANSMISSION LINE.

OPEN BURNING.

PORTABLE OUTDOOR FIREPLACE.

POWERED INDUSTRIAL TRUCK.

RECREATIONAL FIRE.

❖ Definitions of terms can help in the understanding and application of the code requirements. This section directs the code user to Chapter 2 for the proper application of the indicated terms used in this chapter. Terms may be defined in Chapter 2, in another *International Code*® (I-Code®) as indicated in Section 201.3 or the dictionary meaning may be all that is needed (see also commentary, Sections 201 through 201.4).

SECTION 303
ASPHALT KETTLES.

303.1 Transporting. Asphalt (tar) kettles shall not be transported over any highway, road or street when the heat source for the kettle is operating.

Exception: Asphalt (tar) kettles in the process of patching road surfaces.

❖ The hazards of hauling a fired kettle of molten asphalt over public ways are obvious. Most asphalt kettles for roofing, paving and similar uses are currently liquefied petroleum gas (LP-gas) fired. Contractors often wish to keep asphalt in a liquid state to save time between jobs and when work is interrupted. Once asphalt is transformed from a solid to a liquid by heating, it retains much of its heat for some time, and although it becomes increasingly viscous as it cools, it remains fluid for a considerable time. Maintaining a fire under a kettle during transport is usually unnecessary and, therefore, prohibited, since little additional heat is required to return the asphalt to a usable consistency. An accident, flat tire or anything else that could cause the kettle to overturn, spilling the molten asphalt in the presence of an open flame, could lead to a serious fire. Even hitting potholes or other bumps in the road could cause the molten asphalt to splash out of the kettle, causing injury to people nearby or damage to property.

The exception for asphalt being used for road repair is necessary for work crews sealing pavement joints and performing similar roadway repairs for efficient operations.

303.2 Location. Asphalt (tar) kettles shall not be located within 20 feet (6096 mm) of any combustible material, combustible building surface or any building opening and within a controlled area identified by the use of traffic cones, barriers or other *approved* means. Asphalt (tar) kettles and pots shall not be utilized inside or on the roof of a building or structure. Roofing kettles and operating asphalt (tar) kettles shall not block *means of egress*, gates, roadways or entrances.

❖ Asphalt kettles sometimes catch fire. Having one located inside a building would present a serious smoke problem, as well as the fire hazards of asphalt spills flowing to lower floors or the release of LP-gas inside the building. Having one located next to quantities of combustible materials would also represent a fire hazard, as well as the possibility that splashes and splatters could damage construction materials beyond use. Keeping egress pathways and other travel lanes free of obstructions provides a needed immediate exit from an area where an asphalt kettle-related incident might occur and enhances access to such areas for the fire department.

303.3 Location of fuel containers. Fuel containers shall be located at least 10 feet (3048 mm) from the burner.

Exception: Containers properly insulated from heat or flame are allowed to be within 2 feet (610 mm) of the burner.

❖ This section reduces the likelihood that any gas or vapors that might escape from the fuel containers would be ignited by the open flame of the kettle burner and that the heat of the burner would cause overheating of the fuel containers.

The exception acknowledges the greater safety of the insulated containers.

303.4 Attendant. An operating kettle shall be attended by a minimum of one employee knowledgeable of the operations and hazards. The employee shall be within 100 feet (30 480

mm) of the kettle and have the kettle within sight. Ladders or similar obstacles shall not form a part of the route between the attendant and the kettle.

❖ Having a trained attendant watch the kettle helps to create a safe operation. The attendant is usually responsible for making sure the asphalt is at the proper temperature, that the level of liquid in the kettle is maintained at the required level and ensuring that the fuel supply for the kettle burner is adequate. The attendant should watch for any change in the kettle that would signal the potential for a safety hazard, and to adjust the burner output or other factors to keep the kettle in safe operating condition. The attendant is also often responsible for keeping the area surrounding the kettle free of combustible materials and other construction debris that could become a safety hazard.

303.5 Fire extinguishers. There shall be a portable fire extinguisher complying with Section 906 and with a minimum 40-B:C rating within 25 feet (7620 mm) of each asphalt (tar) kettle during the period such kettle is being utilized. Additionally, there shall be one portable fire extinguisher with a minimum 3-A:40-B:C rating on the roof being covered.

❖ This section defines the type and size of extinguisher that must be available for use, both on the ground near the kettle and on the roof level to which the asphalt is being applied. In the event of a kettle fire, water should not be used as an extinguishing agent because it could cause the molten asphalt to froth and possibly overflow the kettle or spatter over anything or anyone in the surrounding area. See also the commentary to Section 3317.3 for roofing operations during construction.

303.6 Lids. Asphalt (tar) kettles shall be equipped with tight-fitting lids.

❖ A tight-fitting lid on a hot kettle keeps the air supply available to feed a kettle fire to a minimum. Any fire that might start in a closed kettle will quickly burn itself out because of the limited amount of air available for combustion. The lid also helps prevent splashes and splatters that could cause personal injury.

303.7 Hi-boys. Hi-boys shall be constructed of noncombustible materials. Hi-boys shall be limited to a capacity of 55 gallons (208 L). Fuel sources or heating elements shall not be allowed as part of a hi-boy.

❖ Hi-boys are used on the roof of a building to transport hot asphalt from a point of supply near the edge of the roof to the site of the roofing application. Due to the hazards of molten asphalt discussed in Section 303.1, hi-boys are limited in size to control the maximum amount of potential spills on the roof, which could ignite and pose a high-challenge, fire-suppression operation for the fire department. A limited size also enhances the movability and stability of the hi-boy, thus reducing the potential for a tip over. As a further safeguard against a fire incident, hi-boys are prohibited from being fired or equipped with a fuel source for firing. Hi-boys must also be constructed of noncombustible materials to enhance their durability and prevent the container from contributing fuel to a fire. Hi-boys should be well-maintained, including the frame; steering mechanism; tires or wheels; faucets and fill connections (see commentary, Section 302.1 for the definition of "Hi-boy").

303.8 Roofing kettles. Roofing kettles shall be constructed of noncombustible materials.

❖ The requirement for noncombustible materials represents sound safety practice as well as good business practice. Portions of kettles constructed of combustible materials can be easily destroyed and could lead to larger fires. Replacement of destroyed kettles would be expensive. Paying for other fire damage would be even more costly.

Also note that roofing mops soaked in asphalt or pitch must never be left inside a building, near heating equipment or near combustible materials. These mops are subject to spontaneous heating no matter what material they are made of.

303.9 Fuel containers under air pressure. Fuel containers that operate under air pressure shall not exceed 20 gallons (76 L) in capacity and shall be *approved*.

❖ Limiting the size of pressurized fuel containers limits the probability of a container becoming a major fuel source in case of a kettle fire. Requiring the use of approved containers gives the fire code official more control over the type and suitability of the vessel to be used under pressure.

SECTION 304
COMBUSTIBLE WASTE MATERIAL

304.1 Waste accumulation prohibited. Combustible waste material creating a fire hazard shall not be allowed to accumulate in buildings or structures or upon premises.

❖ Accumulated waste, trash, construction debris and other natural materials, such as grass clippings, leaves and shrubbery cuttings, can become a serious fire hazard. The three subsections that follow this general statement address the most common situations.

304.1.1 Waste material. Accumulations of wastepaper, wood, hay, straw, weeds, litter or combustible or flammable waste or rubbish of any type shall not be permitted to remain on a roof or in any *court*, yard, vacant lot, alley, parking lot, open space, or beneath a grandstand, *bleacher*, pier, wharf, manufactured home, recreational vehicle or other similar structure.

❖ This section considers the kind of waste material that is most likely to accumulate during construction, renovation, additions or demolition and is often referred to as "the housekeeping section." It prohibits disorderly, unkempt storage or accumulation of trash; waste rags; wastepaper; scrub brush and weeds; lit-