Part III—Fire

CHAPTER 16

FIRE PREVENTION

There are two ways to deal with fire: it can either be prevented or managed. Prevention is considered one of the more popular roles that fire codes have traditionally provided. It is also recognized that the expectation is to limit unwanted ignition to an acceptable level. It is unreasonable to believe that all unwanted ignition can be eliminated.

This section of the performance code is strongly linked to Chapter 18: Management of People, as it is recognized that many fires can be prevented by adequate training and safety procedures. Likewise, public education has a significant impact on individual awareness of fire issues and hence the likelihood of people exhibiting fire-safe behavior.

This section prevents fires from occurring by controlling ignition sources, fuel hazards, and the interaction of the two. Part II of this code avoids dealing with the control of the fuel hazards and focuses on building–system–oriented ignition sources such as water heaters. During the drafting of this document it was noted that the prescriptive fire code usually places a stronger emphasis on preventing ignition than does the prescriptive building code. In fact, the fire prevention provisions drafted for Part II are focused more on building equipment and systems and influenced by codes such as the *National Electrical Code*, the *International Fuel Gas Code*, and the *International Mechanical Code*. Part II, Section 601, does not get involved heavily with fuel load interaction with ignition sources. Between Parts II and III, the ICC *Performance Code for Buildings and Facilities* addresses both temporary ignition sources such as welding and also more permanent installations such as water heaters.

Control of heat/energy sources to limit the occurrence of unwanted ignition would be accomplished, for example, by controlling open burning, open flames, smoking, torches for removing paint, electrical safety (extension cords), asphalt kettles, and unsafe chimneys. Suitable controls and procedures must be identified in meeting the objectives of other sections of this document to prevent ignition. Providing and using equipment that is suitable to the environment they will be exposed to, and in compliance with the listing, are basic expectations to meet this objective. Similarly, maintaining all equipment so that a fire hazard does not exist is important.

It is the designer's responsibility to assess the ignition sources and take whatever actions are necessary to develop a solution that will limit these sources. Though the goal should be to eliminate these sources, it is recognized that it may not be possible to completely eliminate all sources in a cost-effective manner. Therefore a balance of preventing ignition and managing fire is necessary.

In all cases, the fire risk or probability of ignition as well as the impact of even a minor fire must be considered. Special consideration needs to be given to buildings or facilities based on their respective performance groups as defined in Chapter 3.

In addition to the ignition source being controlled, the fuel hazards can be controlled by limiting the quantity, composition, or configuration of the material so that the occurrence of unwanted ignition is limited. This can be accomplished, for example, by specifying requirements for interior finish, furnishings, cleaning of commercial cooking exhausts, accumulation and storage of combustible waste, and other combustible fuel loadings (Christmas trees). These examples are not intended to be exhaustive.

It is recognized that in some cases both ignition sources and fuel hazards may be present. An appropriate strategy to meet the objective may be to provide and maintain barriers or separations between the heat ignition source and the fuel supply, thereby limiting the effects of radiant, convection, and conduction heating.

Examples of employing the strategy of maintaining barriers or separations would be the prescriptive provisions for fire-resistant-rated assemblies, electrical panel clearance requirements, and electrical wiring clearance requirements. Again, these examples are not intended to be exhaustive. This strategy must also be extended to things such as controlling the access of unauthorized individuals to the location of fuel hazards. This can be accomplished, for example, by securing vacant buildings or controlling access to certain areas of the building or facility. Where security cannot be guaranteed in instances such as these, then all fuel hazards should be removed. Consideration should also be given to limiting untrained individuals to certain activities or locations. In addition, the maintenance or respective safeguards should take into account accidental occurrences such as vehicle accidents and impacts that can render well-designed separation strategies inoperative.

The heightened security that has been added in and around high rises and stadia since the September 11, 2001 World Trade Center disaster is another example of a fire prevention solution to factor into a performance design. Indeed, even the security at airports can be considered part of a system of fire prevention protection for our buildings and infrastructure. As discussed in Section 305, building and fire codes have not usually addressed issues such as terrorism. Therefore, fire prevention related to such anticipated ignition sources will need to be explicitly acknowledged as potential events to explain the various fire prevention measures taken.

See also Chapter 18: Management of People.

Because many fires can be prevented by exercising appropriate fire-safe behaviors or practices, it is essential that procedures and training for occupants that facilitate fire-prevention objectives be developed. These must be documented appropriately where they are integral to the strategy for meeting the objective and should include appropriate expectations for follow-up and monitoring.