Fire Risk Assessment Model – Modified NFPA 909

There is no single "correct" way of carrying out a risk assessment. It is important to note that any system on fire risk assessment is based on comparative data, such as, one building is more or less "risky" than the other. However, there is no definitive prescriptive minimum set in any standards.

The following is a diagnostic method in which the various elements in the building are classified in such a way that the building in which they are found should be categorized as being high, normal, or low risk. [modified from NFPA 909]

Once the fire risk is established, corresponding corrective actions or alternate solutions can be attached. Where there are many identified buildings, the evaluator may want to establish varying degrees of "high risk". For example, the LAFC may decide to mandate fire safety systems upgrade, such as sprinklers or fire alarms, to buildings that are considered "high risk" with two or three indicators.

1. **High-Risk Indicators**. The following elements can give rise to high-risk indicators in buildings such as residential buildings and care facilities:
    a. Sleeping accommodations
    b. People
    c. High-risk structural features
    d. High-risk materials

    a. ***Sleeping Accommodations*.** The presence of sleeping accommodations in the building must always indicate the high-risk category. When people are asleep, their ability to respond to fire is reduced and they are therefore more at risk of being overcome by smoke, fumes, or fire before reaching a place of safety. This response to fire could be further reduced if the people are elderly, disabled, deaf, or partially sighted. Ability to control their living environment and familiarity with their surroundings are also factors. Consequently, hotels, boarding houses, hospitals, nursing homes, and shelters for the homeless can be "high-risk buildings."

    b. ***People.*** The presence of people can indicate a high risk if any of the following conditions apply:
        i) There is a large number of members of the general public present in a building with which they are unfamiliar.
        ii) There is a large number of young members of the public in the building, such as daycares or schools.
        iii) There is a high density of people in the building, such as a movie theatre or a lecture hall.

iv) There are people working in isolated or remote parts of the building, such as basements, attics, lofts, lift shafts, or service ducts.
v) There is a high proportion of elderly or disabled people in the building, such as would be found in hospitals, daycare centers, and nursing homes.
vi) There are insufficient staffing levels available to assist members of the public in evacuating the building, such as some care facilities during night time.

c. ***High-Risk Structural Features***. These high-risk indicators will include such items as the following:
i) A complete lack of, or insufficient, fire-resisting compartments.
ii) Vertical or horizontal openings through which the fire could spread, and which would allow the movement of toxic smoke and gases from one part of the building to another.
iii) The use of non-fire-resistant glass in separating walls or in vision panels in fire doors.
iv) Wooden floors supported by wooden joists.
v) Long or complex escape routes.
vi) Large areas of flammable or smoke-producing surfaces on walls and ceilings.

All of these structural features are high-risk indicators because they would greatly increase both the speed of the fire and the chances of the spread of fire within the building, or because they would reduce the effectiveness of the escape routes in providing a safe means of reaching a place of safety before being overcome by the effects of fire.

In this context, it should be noted that some floor coverings will liberate large amounts of heat and large quantities of smoke when involved in a fire, even though they might contribute slowly to the surface spread of fire.

d) ***High Risk Materials***. These are materials that are either easily ignited or when ignited are likely to cause the rapid spread of fire and smoke. The occurrence of these materials can be extremely widespread.
- synthetic textiles
- polyurethane foams
- dried or artificial foliage
- paints

2. **Normal-Risk Indicators**. In general, premises will fall into the normal risk category if the buildings are of conventional construction and if neither the functional capacity or the nature or disposition of its contents are likely to present a serious fire hazard to people in the event of fire.

The specific normal-risk indicators include the following:

(a) A fire is likely to remain localized or at least to spread so slowly as to allow people to escape to a place of safety

(b) There is little risk of the building or its contents catching fire easily, or of producing such large quantities of smoke as to constitute a serious hazard to life

(c) There is an effective automatic means in the building for detecting and giving warning of fire, or an effective automatic system for the extinguishment, suppression, or containment of fire

(d) The presence of such automatic systems allows what would otherwise be a high-risk building to be categorized as being of normal risk

3. **Low-Risk Indicators**. The low-risk indicators include the following:

   a. A minimal risk to life safety
   b. A negligible risk of fire occurring
   c. A negligible risk of fire, smoke, or fumes spreading

   There are probably very few existing low-risk buildings.

Where the LAFC follows a risk assessment in a uniform manner, a list of “triggers” can be established for assessing fire risk in buildings and creating a baseline of minimum acceptability.