One more aspect of the data is revealing: in reported fires in apartments in the USA (from 1983 to 1993, except 1986) between 1 am and 4 am there were 25,497 reported fires of which 395 resulte in one or more fatalities (a total of 573 fatalities). Thus in 98.5% of these fires there were no fatalities. Surveys of fire engineers, regulators and others involved in fire engineering reveal th most people expect fatalities in a far greater proportion of fires, on average people expect fataliti in about 50% of fires - a gross over-estimate.

It is relevant to question why this occurs and how reliable are our perceptions of the degree of ri that fire in buildings represents. If our expectations do not accord with reality then we may app disproportionate measures to the problem, compared with other risks we face as individuals and societies. A thorough understanding of the risks we face due to fire and the effectiveness of th various means we can used to prevent or mitigate them is essential to good risk management.

Conclusion

Risk assessment is a small part of risk management, and it is risk management that is a usef means of addressing fire safety (and many other risks). However, risk assessment is an essenti part of risk management.

Risk management is a process that must be undertaken throughout the life of a building to ensu that risks are identified and managed not just when the building is built, but throughout its intende life. There is much data available that may be used to help in risk management, but greater a more effective use needs to be made of such data, and better data (more complete, more reliabl would be beneficial.

When risk management is undertaken, and the fire safety system in a building is viewed as a whol it becomes obvious that there is no point in great refinement in modelling or analysing one aspect o fire safety when others lack refinement (this observation applies whether a risk approach is adopte or not).

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Fire Physics a Personal Overview

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Instead of an approach discussing fundamental phenomena, we discuss three applications:

1. Interpretation and Modeling of the (Australian) early fire hazard test
2. Heat fluxes, excess pyrolysate and flame heights from fully involved enclosure fires.
3. Radiation from turbulent fires.

These cases represent a wide application spectrum of an approach that pursues the development and use of key *flammability properties* (obtained from small-scale tests) in calculating fire growth and fire intensity in fires.

Key flammability properties can be obtained from calorimeter tests such as in the cone calorimeter and lateral flame spread measurements as in the LIFT apparatus. Flammability properties include thermal properties of unpyrolyzed material and char, ignition parameters and properties of the gaseous effluents after pyrolysis starts. Properties of the gaseous products include their composition, soot formation rates, toxicity and corrosion effects. We use these properties to predict the burning of a material in the Early Fire hazard test which may be considered as an intermediate scale test. [see for details references 1,2,3,4,5,6].

Interaction of fire development in enclosures with the inflow of fresh air from openings is discussed in the second application. The effects of room geometry (cubic like or corridor like) on the intake of fresh air is taken into account in predicting burning inside the enclosure when fully developed conditions are established. Because not all material is burning inside the room, excess pyrolysate and flame extension outside the room is also calculated. Dimensional arguments are employed to determine the relevant quantities using experimental data for determination of constant parameters and validation [7.8].

The last application illustrates how flame radiation in fires can be estimated using measured soot formation rates from materials based on the characterization of smoke point height for a given material. Soot is the main contributor of radiation heat fluxes in fires that are the main cause for the great hazard of fires in buildings, industry and forests.
Turbulence is modeled using k-e –g modeling with a simple soot formation kinetic equation. Results of calculation and experiments are presented for turbulent buoyant jet flames and pool fires. [9,10,11,12]

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