Table 17.1: Guidelines for Risk Assessment	
OCCUPANCY	**REQUIRMENTS**
5. **FIRE MODELS**	**1. GENERAL** i. Fire Models are generally computer models that implement a mathematical model simulating a process or phenomenon based on the input parameters. ii. These computer fire models can provide a faster and more accurate estimate of the impact of a fire and the measures used to prevent or control the fire than many of the methods previously used. Thus they serve as important tool is RA studies. iii. Fire Models can be categorized broadly into two interrelated types. a. Physical. b. Mathematical. **2. PHYSICAL MODELS** i. Physical models attempt to reproduce fire phenomena in a simplified physical situation. Scale models are a widespread form of modeling, as full-scale experiments are expensive, difficult, and sometimes not feasible. Often the goal of physical models is to uncover laws governing the behavior of physical/ chemical systems. **3. MATHEMATICAL MODELS** i. Mathematical models are sets of equations that describe the behavior of a physical system. The resulting mathematical model can then be used to predict the behavior of real physical systems. Mathematical models can be further classified into two types. a. Deterministic Models b. Probabilistic Models **3.a. DETERMINISTIC MODELS** i. In a deterministic model, the quantities being modeled are treated as being completely certain — the purpose of the model is to provide an estimate of these quantities. For example, in a conventional deterministic zone model for compartment fires, the average hot gas layer temperature at any given point in time is computed as having a single, known value. ii. Deterministic fire models can range from simple one-line correlations of data to highly complex models requiring weeks of computing time using dozens of computers. The unifying aspect of these models is that the course of a fire is fixed by the variables that establish the environment in which it occurs. The physical conditions that determine the progress and outcome of the fire are dependent on the fire scenarios, discussed earlier. iii. Deterministic models can incorporate our empirical knowledge of fire phenomena and the calculations focus on the interaction of objects, such as fire sources and layers through equations describing conservation of mass and energy. These models are relatively simple so that very large buildings can be modeled using these techniques. The most identifiable field model is the computational fluid dynamics (CFD) model.