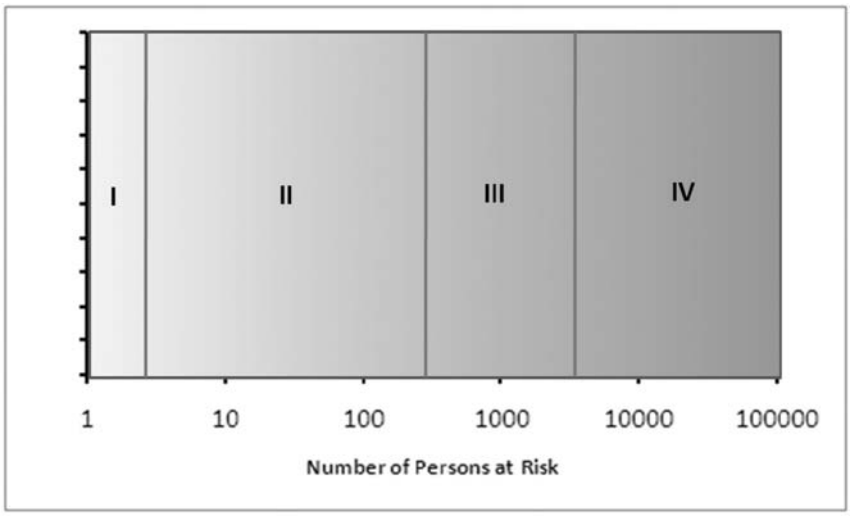

FIGURE C1-1 Approximate Relationship between Number of Lives Placed at Risk by a Failure and Occupancy Category.

placed into a higher risk category than office buildings housing the same number of persons.

A rational basis should be used to determine the risk category for structural design, which is primarily based on the number of persons whose lives would be endangered or whose welfare would be affected in the event of failure. Figure C1-1 illustrates this concept.

"Lives at risk" pertains to the number of people at serious risk of life loss given a structural failure. The risk category classification is not the same as the building code occupancy capacity which is mostly based on risk to life from fire. The lives at risk from a structural failure include persons who may be outside the structure in question who are nonetheless put at serious risk by failure of the structure. From this concept, emergency recovery facilities that serve large populations, even though the structure might shelter relatively few people, are moved into the higher risk categories.

When determining the population at risk, consideration should also be given to longer term risks to life than those created during a structural failure. The failure of some buildings and structures, or their inability to function after a severe storm, earthquake, or other disaster, can have far-reaching impact. For example, loss of functionality in one or more fire stations could inhibit the ability of a fire department to extinguish fires, allowing fires to spread and placing many more people at risk. Similarly, the loss of function of a hospital could prevent the treatment of many patients over a period of months.

In Chapters 7, 10, and 11, importance factors are presented for the four risk categories identified. The specific importance factors differ according to the statistical characteristics of the environmental loads and the manner in which the structure responds to the loads. The principle of requiring more stringent loading criteria for situations in which the consequence of failure may be severe has been recognized in previous versions of this standard by the specification of mean recurrence interval maps for wind speed and ground snow load.

This section now recognizes that there may be situations when it is acceptable to assign multiple risk categories to a structure based on use and the type of load condition being evaluated. For instance, there are circumstances when a structure should appropriately be designed for wind loads with importance factors greater than one, but would be penalized unnecessarily if designed for seismic loads with importance factors greater than one. An example would be a hurricane shelter in a low seismic area. The structure would be classified in Risk Category IV for wind design and in Risk Category II for seismic design.

C1.5.3 Toxic, Highly Toxic, and Explosive Substances

A common method of categorizing structures storing toxic, highly toxic, or explosive substances is by the use of a table of exempt amounts of these materials (EPA 1999b and International Code Council 2000). These references and others are sources of guidance on the identification of materials of these