

Chapter 5

RECOMMENDATIONS

5.1 GENERAL

In its final report on the collapse of the World Trade Center towers (NIST NCSTAR 1), NIST made 30 recommendations for improving the safety of buildings, occupants, and emergency responders. These encompass increased structural integrity, enhanced fire endurance of structures, new methods for fire resistant design of structures, improved active fire protection, improved building evacuation, improved emergency response, improved procedures and practices, and education and training.

WTC 7 was unlike the WTC towers in many respects. It was a more typical tall building¹ in the design of its structural system. It was not struck by an airplane. The fires in WTC 7 were quite different from those in the towers. Since WTC 7 was not doused with thousands of gallons of jet fuel, large areas of any floor were not ignited simultaneously. Instead, the fires in WTC 7 were similar to those that have occurred previously in several tall buildings where the sprinklers did not function or were not present. These buildings did not succumb to the fires and collapse because they were of structural designs that differed from that of WTC 7.

The Investigation Team has compiled a list of key factors that enabled ordinary fires to result in an extraordinary outcome. In so doing, the Team recognized that there were additional aspects to be included in the content of some of the 30 earlier recommendations.

Based on the findings of this Investigation, NIST has identified one new recommendation and has reiterated 12 recommendations from the Investigation of the WTC towers.

The urgency of the prior recommendations is substantially reinforced by their pertinence to the collapse of WTC 7, a tall building that is based on a structural system design that is in widespread use. A few of the prior recommendations have been modified to reflect the findings of this Investigation.

The partial or total collapse of a building due to fires is an infrequent event. This is particularly true for buildings with a reliably operating active fire protection system such as an automatic fire sprinkler system. A properly designed and operating automatic sprinkler system will contain fires while they are small and, in most instances, prevent them from growing and spreading to threaten structural integrity. Fires that have spread and grown can also be extinguished by fire fighters when they are smaller than 10,000 sq ft.

The intent of current practice, based on prescriptive standards and codes, is to achieve life safety, not collapse prevention. However, the key premise of NIST's recommendations is that buildings should not

¹ The term "tall building" is used by architects and structural engineers to indicate buildings that are taller than surrounding buildings, slender in their proportions, and/or require technologies such as wind bracing to carry loads, and are nominally taller than 15 to 20 stories. For fire protection engineers, the term "high-rise building" is used to indicate buildings that are nominally taller than 25 m (75 ft), and external rescue from fires is no longer possible. Both terms apply to WTC 7.