

Chapter 4

FIRE PROTECTION MEASURES

4.1 OVERVIEW

Active and passive elements were used in the fire protection systems of WTC 7. The active fire protection systems in WTC 7 consisted of fire sensors and alarms, notification systems, automatic fire sprinklers, water supplies, and smoke management. The sprinkler systems were the first line of defense. Water stored in the building from public sources or pumped from fire apparatus was supplied through dedicated piping to the area of the fire. Also present in the buildings were hoses, pre-connected to a water supply through standpipes located in the stairwells and other utility shafts. The standpipes provided hose connections at each floor for the Fire Department of the City of New York (FDNY). In addition, pre-connected standpipe hoses were installed for trained occupants to suppress fires.

Occupants in the building depended on the fire alarm and emergency notification system to detect fires and provide information for emergency evacuation. Capabilities were also designed for the ventilation system to operate in a way to purge smoke produced by fires from the building. Smoke purging was intended to be used for post-fire clean-up, but could be used during a fire event at the discretion of the FDNY.

Passive fire protection provided a second line of defense against structural damage by uncontrolled fires. The passive components included both horizontal and vertical fire barriers and spray-applied fire resistive material (SFRM). The concrete floor slabs were fire rated, as were the walls surrounding the power transformers and the building core. Because the building was fully sprinklered, no partitioning of the open floors (within a single tenant space) with demising walls was required by the New York City Building Code. Nonetheless, some of the interior walls in the tenant spaces provided temporary obstructions to flame spread. The structural steel columns, beams, and girders, as well as the underside of the concrete floor slabs, were coated with Monokote MK-5, a spray-applied fire resistive material, as documented in Chapter 2.

NCSTAR 1-4 includes a thorough examination of the design and installation of the active fire protection systems in WTC 7 (as well as in WTC 1 and WTC 2) and a description of the normal operation of fully functional systems and their potential effectiveness for controlling the fires on September 11, 2001. The applicable building and fire codes and standards, as well as the history of fires in these buildings, were also documented in NCSTAR 1-4. The following section provides a summary of the key information from NCSTAR 1-4 as it pertains to WTC 7.

There was no evidence to suggest that the fires that eventually brought WTC 7 down originated or propagated within the Con Edison substation located on the lower floors of WTC 7 (Appendix A). Thus, the Con Edison fire protection systems are not presented here. (Information on the design and operation of the substation can be found in Appendix A of this report.)