

ABSTRACT

This is the final report on the National Institute of Standards and Technology (NIST) investigation of the collapse of World Trade Center Building 7 (WTC 7), conducted under the National Construction Safety Team Act. This report describes how the fires that followed the impact of debris from the collapse of WTC 1 (the north tower) led to the collapse of WTC 7; an evaluation of the building evacuation and emergency response procedures; what procedures and practices were used in the design, construction, operation, and maintenance of the building; and areas in current building and fire codes, standards, and practices that warrant revision. Extensive details are found in the companion reports, NIST NCSTAR 1-9 and NIST NCSTAR 1-9A.

Also in this report is a summary of how NIST reached its conclusions. NIST complemented in-house expertise with private sector technical experts; accumulated copious documents, photographs, and videos of the disaster; conducted first-person interviews of building occupants and emergency responders; analyzed the evacuation and emergency response operations in and around WTC 7; performed computer simulations of the behavior of WTC 7 on September 11, 2001; and combined the knowledge gained into a probable collapse sequence.

The report concludes with a list of 13 recommendations for action in the areas of increased structural integrity, enhanced fire endurance of structures, new methods for fire resistant design of structures, enhanced active fire protection, improved emergency response, improved procedures and practices, and education and training. One of these is new; the other 12 are reiterated from the investigation into the collapse of the WTC towers. Each of the 13 is relevant to WTC 7.

Keywords: building evacuation, emergency response, fire safety, structural collapse, tall buildings, World Trade Center.