

Probable Cause Sequences for WTC Collapses Finalized

12 April 2005

At a press briefing in New York City on April 5, the National Institute of Standards and Technology (NIST) presented its analysis of how the World Trade Center (WTC) towers collapsed after two aircraft were flown into the buildings by terrorists on Sept. 11, 2001. The study is the most detailed examination of a building failure ever conducted.

“Like most building collapses, these events were the result of a combination of factors,” said Shyam Sunder, lead investigator for the agency’s building and fire safety investigation into the WTC disaster. “While the buildings were able to withstand the initial impact of the aircraft, the resulting fires that spread through the towers weakened support columns and floors that had fireproofing dislodged by the impacts. This eventually led to collapse as the perimeter columns were pulled inward by the sagging floors and buckled.”

The probable collapse sequences update and finalize hypotheses released by NIST last October. The sequences are supported by extensive computer modeling and the evidence held by NIST, including photographs and videos, recovered steel, eyewitness accounts and emergency communication records. Additionally, this information was used to document a variety of factors affecting the performance of the buildings, the efforts of emergency responders and the ability of occupants to escape prior to the collapses. In turn, NIST has identified a number of future practices and technologies that potentially could have enhanced building performance and life safety capabilities on 9-11 had they been available for implementation.

NIST also released drafts of 15 reports from three projects of the investigation: analysis of building and fire codes and practices; occupant behavior, egress and emergency communications; and fire service technologies and guidelines.

Recommendations for improvements to building

and fire codes, standards and practices derived from these and the other five projects in the investigation will be released for public comment in June, along with the draft of the final investigation report and drafts of 27 reports from the remaining five projects.

Source: NIST

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