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S. Shyam Sunder is acting deputy director of the Building and Fire Research Laboratory (BFRL) at the National Institute of Standards and Technology (NIST).

In his current position, Dr. Sunder serves as the lead investigator for the federal building and fire safety investigation into the World Trade Center disaster; leads NIST activities related to the National Earthquake Hazards Reduction Program; oversees NIST activities related to the National Construction Safety Team Act; guides effective implementation of the NIST strategic plan within BFRL and the four BFRL goals: Homeland Security, Fire Loss Reduction, Enhanced Building Performance, and High-Performance Construction Materials and Systems; chairs the Interagency Committee on Seismic Safety in Construction — a group that recommends policies and practices to its 32 member-agencies on improving the seismic safety of federal buildings nationwide; and serves as the U.S.-side chair of the Wind and Seismic Effects Panel established under the U.S.-Japan Cooperative Program on Natural Resources.

Dr. Sunder holds a Bachelor of Technology (Honors) in Civil Engineering from the Indian Institute of Technology, Delhi; a Master of Science in Civil Engineering from Massachusetts Institute of Technology; and a Doctorate of Science in Structural Engineering from MIT.

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The Federal Building and Fire Safety Investigation of the World Trade Center Disaster

A major scientifically based investigation of the WTC disaster was completed recently by NIST. The investigations establish the technical causes of building failures and evaluate the technical aspects of response and evacuation. NIST is a neutral investigator, as it is not a regulatory agency and does not issue standards or codes.

The primary objectives of the investigation of the WTC disaster were to determine:

- why and how the WTC buildings collapsed after the initial impact of the aircraft
- why the injuries and fatalities were so low or high depending on location
- what were the procedures/practices used in design, construction, operation, and maintenance of the WTC
- which building and fire safety practices, standards, and codes warrant revision.

This session will discuss the investigation efforts to make buildings, occupants, and responders safer, specifically:

- Each tower's probable collapse sequence after the aircraft impact and subsequent fires on September 11, 2001
- The rigorous and detailed methodology used to analyze the aircraft impacts, fire dynamics, structural thermal response, and collapse due to the effects of aircraft impact and fire damage
- The study of evacuation and emergency response that included nearly 1,200 first-person interviews of building occupants, first responders, and families of victims
- Specific recommendations for improvements to building and fire codes, standards, and practices, including improvements to structural integrity, fire protection, building evacuation, and emergency response.