

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

**Status of Project #8: Fire Service
Technologies and Guidelines**

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Purpose

Build upon work already done by the Fire Department of New York (FDNY) and McKinsey & Company by:

- (1) Documenting what happened during the response by the fire service to the attacks on the World Trade Center, up to the time of collapse of WTC 7
- (2) Identifying issues that need to be addressed in changes to practices, standards, and codes
- (3) Identifying alternative practices and/or technologies that may address these issues
- (4) Identifying R&D needs that advance the safety of the fire service in responding to massive fires in tall buildings

Scope of Occupant Behavior, Evacuation, and Emergency Response Study

- **Occupant behavior and evacuation technologies and practices for tall buildings**
 - Decision-making and situation awareness
 - Time-constrained evacuation strategies (e.g., defend-in-place)
 - Role of floor wardens and fire safety directors
 - Issues concerning people with disabilities
 - Human factors issues and design of egress system
- **Firefighting technologies and practices for tall buildings**
 - Means for emergency access, time to reach affected floors
 - Firefighting versus evacuation
 - Physical condition of firefighter under high-rise work conditions
- **Command, control, and communication systems for emergency response**
 - Location of incident command post; mobilization, staging, and deployment; logistics; equipment; training; pre-event planning
 - Content and timing, among occupants and authorities, within and outside buildings, intra- and inter-group communications
- **Observations of fire/smoke conditions, structural damage, water flow, aircraft fuel**

Approach

- Document the emergency response on 9/11/01 with a focus on evacuation and fire fighting

Desired Outcome

- Enhanced emergency response capabilities
- Enhanced safety of first responders

Tasks

1. Data Collection (FDNY, NYPD, PANYNJ/PAPD)

- Documents
- Photographs and videos
- Electronic data (audio communications)

2. Field Interviews (up to 175 - 225)

- FDNY* - fire fighters, EMS, officers (company & command)
- NYPD* - police emergency service units, police aviation units, command post officers
- PANYNJ/PAPD - officers, commanders, safety personnel, & security personnel
- First responders on 9/11 who are now retired

3. Documentation and Analysis

- Detailed timeline of events
- Visual representation of disaster site
- Analyze emergency response factors

* NIST and NYC are engaged in negotiations regarding these interviews.

Field Interviews with First Responders

1. Face-to-Face Interviews

- Interviews by contractor using generic interview protocol (75 - 100): document observed effects (what)
- Interviews by NIST staff using investigative interview protocol (50 - 75): identify causal factors (why)

2. Focus Group Interviews

- Interviews by contractor using generic focus group protocol (10 focus groups of 5 each)

Contractor Conducted Interviews: Semi-structured generic protocol (Document observed effects or what)

- Categories of information collection
 1. Dispatch and arrival
 2. Entry
 3. Communications and encounters
 4. Building conditions
 5. Training and equipment
 6. Other
- Develop keyword searchable database
- Data analysis using the same computer-based tools as Project #7

NIST Conducted Interviews: Investigative lead-following protocol (Identify causal factors or why)

- Targeted interviews of people with knowledge in the following categories:
 1. Operational policies and procedures
 2. Dispatch, deployment
 3. Communications
 4. Incident command, control, command posts, fire fighter health and safety
 5. Emergency response equipment and technology
 6. Elevator operations in high-rise buildings
 7. High-rise building operations and procedures, fire fighting, search & rescue before the towers fell, evacuation, roof operations and aviation unit
- Develop keyword searchable database
- Data analysis protocols
 - Fire Fighter Line-of-Duty Death & Injury Investigation, IAFF;
 - NFPA 921, Guide for Fire and Explosion Investigations

Recreation and Analysis Approach

Review, Compare, and Analyze:

- Documentary data
- Photographic data
- Electronic data
- Data from first-person interviews

Develop:

- Detailed timeline of events
- Visual representation of disaster site
- Assessment of emergency response factors

Derive:

- Findings
- Conclusions
- Recommendations

Contact Information

- **Survivors, families, and retired first responders may volunteer to participate in the face-to-face interviews by contacting:**

877-221-7828 (toll free)

- **Alternatively, families of victims may volunteer to participate in the face-to-face interviews via the following web site:**

<https://wtc.nist.gov/family>

- **Anonymous tip line: 888-804-7581 (toll free)**

- Mail address: NIST World Trade Center Investigation Team
100 Bureau Drive, Stop 8610
Gaithersburg, MD 20899-8610

- E-mail: wtc@nist.gov
- Facsimile: 301-975-6122
- WTC web site: <http://wtc.nist.gov>