Status of Project #8: Fire Service Technologies and Guidelines

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Project Staff

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Expert Consultants:

Vincent Dunn, Retired Chief, FDNY

John Hodgens, Retired Chief, FDNY

Kevin Malley, Retired Director of Human Performance, FDNY

Expert consultants provide NIST with unique knowledge
and insight related to emergency responder training, response,
operations policy, on-scene operations, response technology,
and communications, on 9/11/01.

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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

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Technical Issues to be Investigated

- **Occupant behavior and evacuation technologies and practices for tall buildings (Project 7)**
    - 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
    - Situation awareness

- **Command, control, and communication systems for emergency response**
    - Content and timing and quality of communications, among occupants and authorities, within and outside buildings, intra and inter group communications

- **Observations of fire and smoke conditions, structural damage, water flow, liquid fuel from aircraft (Project 7)**

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Approach

- Recreate 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

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Emergency Response Factors To Be Studied

- First Responders - dispatch, deployment, operations, fatalities/injuries

- Physical Assets - dispatch, deployment, operations, losses

- Command and Control - command posts, staging, deployment, management, accountability

- Communications - design, installation, operations, interoperability

- Operational Policies and Procedures - mobilization, access, high-rise operations, safety, inspection, enforcement

- Preparedness - training, equipment, logistics, field simulation exercises

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Tasks

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

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

2. Field Interviews (approximately 125 - 200)

- 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

3. Recreation and Analysis

- Detailed Timeline of Events
- Visual Representation of Disaster Site
- Analyze emergency response factors

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Current Data Collection *

DOCUMENTS:

- Human Data: Fatality Lists, Injury Lists, Emotional Stress Statistics, Surviving Personnel Lists

- Operations Data: Dispatch Lists; Unit Operations Reports, CD 12's; Equipment Loss Lists; Training; High-Rise Building SOP's; Elevator Use SOP's; Helicopter Roof Rescue Policies and SOP's; Design and Operation of Communications Systems; Incident Command Policies

PHOTOGRAPHIC:

- Hundreds of still photographs, and tens of video tapes

ELECTRONIC:

- 1000+ hours of audio recordings of radio communications and telephone communications

* Additional materials pending.

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Field Interviews

1. Face-to-Face Interviews

- Interviews by contractor using generic interview protocol (75 - 150): document observed effects (what)

- Interviews by NIST staff using investigative interview protocol (50 - 60): identify causal factors (why)

2. Focus Group Interviews

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

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Reviews and Approvals

1. Contractor IRB + NIST approval

2. NIST IRB for NIST interviews

3. Certificate of Confidentially from the Department of Health and Human Services

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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 data base

- Data analysis using the same computer based tools as Project #7

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NIST Conducted Interviews:
Investigative Lead-Following Protocol
(Identify Causal Factors or Why)

- Targeted interviews of people with knowledge in the following categories: (4 to 8 people per category)

  1. Operational policies and procedures
  2. Dispatch, deployment
  3. Communications
  4. Incident command, control, command posts, personnel accountability, 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

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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

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Advisory Committee Feedback

- Overall goals and objectives

- Data collection, review, and analysis approach

- Other ideas or suggestions?

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