

Awarded Contracts for External Experts to Support the NIST World Trade Center (WTC) Disaster Investigation

Contract No.	Awarded to	Date Awarded
SB1341-03-W-1225	Hughes Associates, Inc. (HAI)	9/22/2003

ANALYSIS OF ACTIVE FIRE PROTECTION SYSTEMS--SPRINKLERS, STANDPIPE, AND PRE-CONNECTED HOSES IN WTC BUILDINGS 1, 2, AND 7

Under solicitation number SB1341-03-Q-0463, a firm fixed price purchase order has been awarded to Hughes Associates, Inc. (HAI).

Established in 1980, HAI is a fire protection engineering, research, and consulting firm whose experience includes fire hazard and risk analysis, fire modeling, fire protection design, code consulting, product development, and litigation support. HAI's staff has earned an international reputation in the application of advanced technologies to solve both standard and unique fire protection problems.

Specific tasks related to WTC Buildings 1, 2, and 7 that the Hughes team will perform include:

- 1) Document the design and installation of the fire sprinkler system, standpipe system, and pre-connected hoses and compare designs to applicable code and standards requirements.
- 2) Document the design and capacity of the water supply systems to the fire sprinklers, including provisions for redundancy.
- 3) Identify and document differences in the design of the water supply, fire sprinkler system, standpipe system, and pre-connected hoses between WTC 1, 2, and 7.
- 4) Document the normal operation and effect of the fully functional fire sprinkler system, standpipe system, and pre-connected hoses for fire control.
- 5) Document the performance of the fire sprinkler system, standpipe system, and pre-connected hoses on September 11, 2001.

HAI's project team includes senior level engineers with extensive experience in the design, specification, installation, testing, and performance assessment of fire suppression systems, including automatic fire sprinkler systems, water supplies, and standpipe systems. The team's experience in performance assessments includes (1) experimental evaluations of new suppression concepts, (2) detailed engineering analyses of proposed and existing suppression systems in support of fire incident investigations and fire hazard analyses, and (3) code and standards compliance evaluation of existing systems.

The team is also experienced in evaluation of the effectiveness of manual fire fighting tactics, development of manual fire fighting doctrines and procedures, and evaluation of the effectiveness of existing fire department services.

Selected experience of the key personnel assigned to this effort is summarized below:

Edward K. Budnick, Principal Investigator - Mr. Budnick has over 25 years of experience including fire protection engineering R&D, quantitative fire hazards analysis, and design and evaluation of fire suppression systems. Mr. Budnick is the chair of the NFPA 13 Automatic Sprinkler Committee on Design Discharge and has participated in the development of standards for installation and performance of automatic sprinkler and standpipe systems and hose stream requirements for high rise buildings. He has performed code and standards compliance evaluations of existing and proposed suppression systems and has also designed, tested, and approved installations of automatic sprinkler and standpipe systems for high rise buildings. Mr. Budnick has also written handbook sections on fire sprinkler system performance and reliability in business and other types of occupancies.

Jack Mawhinney, Senior Engineer - As a member of HAI's Advanced Fire Suppression Systems Group Mr. Mawhinney brings over 30 years of experience in fire suppression technology to this effort. His expertise is unique in that he has suppression system design, installation and R&D experience. His experience ranges from actual pipe fitting and sprinkler installation to experimental R&D associated with automatic sprinkles and other water based suppression technologies. Mr. Mawhinney has performed suppression system investigations and failure analyses, is a past member of NFPA 13 where he participated in subcommittee activities related to evaluation of sprinkler performance under shielded or partial failure mode conditions, and is the current Chair of NFPA 750, Water Mist Suppression. Mr. Mawhinney has authored handbook chapters on fire suppression technologies.

Mark Hopkins, Senior Engineer - Mr. Hopkins is a senior engineer in HAI's Sprinkler and Suppression System Design Group. Mr. Hopkins has over ten years of experience in all aspects of automatic sprinkler and standpipe, water supply design, specification, installation and commissioning. His experience includes interfacing of automatic sprinkler system with fire alarm systems in large, multistory, zoned high rise buildings. He also has performed failure analyses and related investigations of existing automatic sprinkler systems.