

## Expertise of Personnel who Participated in NIST WTC Studies

\*Principal Investigator/Key Contact

How many employees still listed that were involved in NCSTAR1 and disciplines.

Notes:

2 or 3 connections to SRI

1 connection to Los Alamos

1 connection to Lawrence Livermore

Contractor	Person	Specializations
ARA	Steven Kirkpatrick*	Nonlinear finite element analysis; blast, impact, and penetration mechanics; structural dynamic crashworthiness and transportation safety; dynamic buckling; mechanics of composite materials.
	Robert T. Bocchieri	Solid mechanics, materials constitutive modeling; rate-dependent material behavior, fracture mechanics failure analysis; mechanics of composite materials; nonlinear viscoelasticity; applied mechanics; finite element analysis; structural dynamics; crashworthiness and transportation safety; nondestructive evaluation of materials and structures.
	Robert W. Cilke	“Benefits to the Warfighter from DTRA Hard Target Defeat Air-Delivered Weapon Testing” Contributed to ( <a href="http://www.saviac.org/76th_Symposium/Abstracts/L-48.htm">http://www.saviac.org/76th_Symposium/Abstracts/L-48.htm</a> )
	Marsh Hardy	From: <a href="http://www.sbafla.com/methodology/pdf/2000/ara/ARA%20FCHLPM%20Feb2001.pdf">http://www.sbafla.com/methodology/pdf/2000/ara/ARA%20FCHLPM%20Feb2001.pdf</a> Marsh Hardy, M.S. - Mr. Marshall Hardy has over ten years experience in applied statistical analysis and probabilistic risk assessment. He has a <b>Masters degree in Statistics</b> from the University of Kentucky. He has approximately 4 years experience in support of hurricane modeling relevant to insurance loss analysis and making. Mr. Hardy performs multivariate statistical analysis and tests for ARA’s wind engineering applications. He has aided in the design of simulations, analyzed loss distributions, and performed multivariate analysis of hurricane damage and loss data sets. He has aided in the development of loss functions. He was a key developer of ARA’s TORSCR code that is now the nuclear power industry standard for PRA for extreme wind and tornado missile hazard. He has applied the TORSCR code and statistically characterized distribution parameters for nuclear power plant PRAs. Mr. Hardy has also served as lead statistical analyst on numerous <b>DoD</b> , NSF, EPA projects. This experience involved statistical modeling of uncertainty in nonlinear elastoplastic response to wind, or multivariate analysis of variance (ANOVA) to identify dominant uncertainties in the prediction methodologies, and cluster analysis for code validation. Mr. Hardy is an expert in the SAS statistical analysis system that will be used in this work and is also an experienced FORTRAN programmer on a number of systems including the DNA Cray at <b>Los Alamos</b> , DEC minicomputers, and PCs.

Samuel Holmes	<p><a href="http://www.redwingengineering.com/biography.html">http://www.redwingengineering.com/biography.html</a></p> <p>Dr. Holmes is an accomplished project leader and principal investigator with 40 years of engineering experience including research in computational fluid dynamics, offshore oil platform hydrodynamics, computational aeroacoustics, <b>explosive blast effects, laser effects</b>, finite element analysis, and structural dynamics. Recently, Dr. Holmes was Vice President of Engineering Services at ACUSIM Software, Inc., and previously was a Principal Engineer at Applied Research Associates, Inc., and Director of Engineering Services for Cer Inc. He has acted as principal investigator for a wide variety of fluid mechanics problems including development of blood flow damage models funded by NIH, the flow through blood pumps and the behavior of stents allografts. Other experience includes studies of flows in automobile cabins, engine exhaust, computational aeroacoustics, train aerodynamics and aeroacoustics, as well as related dynamic structural response and interaction studies. Also: <b>1982-1992 SRI INTERNATIONAL,</b></p>
Robert A. MacNeill	<p>Mr. MacNeill has over 5 years engineering experience including specialized experience involving heat transfer in <b>composite materials</b>, vehicle crashworthiness, and solid rocket motor and infrared countermeasure development analysis, and testing. As a research engineer at ARA, Mr. MacNeill has been involved in a wide assortment of programs including passenger train aerodynamics, passenger car and train crashworthiness, and laser heat effects on pressurized rocket motor cases. Before joining ARA, Mr. MacNeill worked as a research engineer and IPT lead for solid rocket motor subsystems at Pratt &amp; Whitney. Prior to P&amp;W, he was a project engineer analyzing, designing, and testing next generation pyrotechnic infrared countermeasures for Tracor Aerospace. In addition to his practical design and testing experience, Mr. MacNeill has an extensive and varied analytical background including work in fluid mechanics, heat transfer, <b>solid mechanics</b>, analysis of dynamic systems, and threat engagement analysis.</p>
Claudia Navarro	<p>Ms. Navarro is currently supporting projects in finite element analysis and computational fluid dynamics. Before joining ARA, Ms. Navarro was a research assistant at The University of Texas at Austin where she worked with lasers and optics to detect isotope gas ratios for biomedical applications. Ms. Navarro has a varied background including coursework in aerospace engineering, physics, <b>mechanical engineering</b>, artificial intelligence, mathematics, and computer science.</p> <p>Professional Experience</p>
Brian D. Peterson	<p>Dynamic response of structures to penetration and explosive loads; Fatigue cracking of nickel alloys; Assessment of industrial hazards.</p> <p>1997 – 2003: <b>Research Engineer, SRI International</b>, Menlo Park, CA Led and performed research projects on the response of materials and structures under impact, explosion, and other dynamic conditions.</p>

	Justin Y.T. Wu	<p>Dr. Justin Wu is the technical lead in performing the uncertainty analysis of this project. Dr. Wu is the director of probabilistic engineering at ARA. He is a renowned expert in probabilistic methods with 20 years of experience in the development and application of innovative physics-based probabilistic methods for a range of applications including structural reliability analysis and design of space shuttle, aircraft, offshore pipeline, power plant, and automotive; nuclear waste repository risk assessment, and hard target uncertainty analysis. Dr. Wu heads the development of ARA's ProFES (Probabilistic Function Evaluation System) software package, previously supported by the Air Force and NASA. He also leads the development of methods and software tools for hard target uncertainty analysis for DTRA, reliability-based multi-disciplinary design for NASA, and rotorcraft probabilistic damage tolerance analysis for FAA. He has more than 100 publications. Dr. Wu has a doctorate in mechanical engineering from University of Arizona.</p>
<b>SOM</b>	Bill Baker (Listed on SOM website)	<p>Bill Baker is the partner in charge of Structural and Civil Engineering for the Chicago and London offices of Skidmore, Owings &amp; Merrill LLP. Mr. Baker pursues a collaborative process which resonates with SOM's multidisciplinary practice. His approach to structural engineering seeks to integrate form, function, and aesthetics. Since joining the firm in 1981, Mr. Baker has worked on a broad range of engineering projects including designing structural systems for supertall buildings, to smaller, specialized structures and engineer collaborations with artists.</p> <p>Mr. Baker leads the Structural Engineering studio to ensure that quality, innovation, material economy, and efficiency are customized to fit each project's scope and needs. Mr. Baker has developed the structural system for the <a href="#">Burj Dubai</a>, which is planned to become the world's tallest building in 2009. His recent completed projects include the long span structure of the <a href="#">Virginia Beach Convention Center</a> and the glass cable-net entrance <a href="#">pavilion of the General Motors Renaissance Center</a> in Detroit, Michigan.</p> <p>In addition to his work at SOM, Mr. Baker is frequently invited to lecture on a variety of structural and civil engineering topics within the U.S. and abroad.</p>

<p>Bob Sinn (not Listed on SOM website)</p>	<p>Mr. Robert C. Sinn, PE, SE, is a senior structural engineer and associate partner at SOM and has about 19 years of structural engineering experience ranging from high-rise buildings to long-span roofs. Mr. Sinn has extensive experience in computer-applied analysis and design techniques. He is a fellow of the American Society of Civil Engineers (ASCE). In 1999, he received ASCE's award for innovation in Civil Engineering for his work on the Guggenheim Museum, Bilbao, Spain. Examples of his design projects include:</p> <ul style="list-style-type: none"> <li>• Structural engineering peer review of the Petronas towers, Kuala Lumpur, Malaysia (1996): two 88-story towers</li> <li>• Plaza Rakyat Office Tower, Kuala Lumpur, Malaysia (1999): a 77 story tower</li> <li>• Xiamen Posts and Telecommunications Building, Fujian Province, China (2000): a 66-story office tower</li> <li>• 7 South Dearborn, Chicago (2002): a proposal for 110 story office, retail and residential tower</li> </ul>	
<p>John Zils (Not Listed on SOM website)</p>	<p>Mr. John J. Zils, PE, SE, is a senior structural engineer and associate partner at SOM with about 37 years of structural engineering experience including many of SOM's best known and most complex structures. He is a fellow of the American Society of Civil Engineers (ASCE) and the American Institute of Architects (AIA). He has published numerous articles on engineering advancements, lectures frequently, and has served as an adjunct professor at the University of Illinois. Examples of his design projects include:</p> <ul style="list-style-type: none"> <li>• The Sears Tower, Chicago (1974): a 110-story office building</li> <li>• Onterie Center Tower, Chicago (1984): a 60 story residential tower</li> <li>• Dearborn Tower, Chicago (1990): a proposal for 84-story office and retail complex</li> <li>• 7 South Dearborn, Chicago (2002): a proposal for 110 story office, retail and residential tower</li> </ul>	
<p><b>UL</b></p>	<p>Fred Hervey*</p>	<p>Mr. Hervey has experience in testing and related work on structural steel protected with spray-applied resistive materials and mastic and intumescent coatings</p>
	<p>Joseph Treadway*</p>	<p>Mr. Treadway has 13 years experience in the testing of protection materials for structural steel in accord with ANSI/UL 263, "Fire Tests of Building Construction and Materials," and ANSI/UL 1709, "Rapid Rise Tests of Protection Materials for Structural Steel."</p>
	<p>Mark Izydorek</p>	<p>No information found</p>
	<p>Aldo Jimenez</p>	<p>Fire Test Technician</p>

<p>William Joy</p>	<p>Probably a technician... from: <a href="http://911-engineers.blogspot.com/2007_09_23_archive.html">http://911-engineers.blogspot.com/2007_09_23_archive.html</a></p> <p>An Oversized Barbecue</p> <p>At the Underwriters Laboratory campus in this northern Chicago suburb, where workers carry out those blast tests in a yawning building reminiscent of an airplane hangar, forklifts shuttle back and forth, moving 1 columns, while cranes suspended from overhead rails slowly lift giant sections of roof into the furnaces technicians mill about in front of a forest of dials, gauges and controls.</p> <p>Three huge furnaces, each in a separate corner of the hangar, are designed to handle three different tests: on steel columns, one for wall assemblies, and one for ceilings and floors. Little about the setup is high-tech.</p> <p>"Do you need the torch, Bill?" Eckhard Brodde, an assistant, yelled to the foreman, Bill Joy, as the two prep the cube-shaped furnace for testing columns last week.</p> <p>"Let's close the door first," Mr. Joy yelled back. Both gave it a heavy push. "It is not moving," Mr. Joy before an extra shove was applied. "There you go," he said, as the door clicked into place.</p> <p>As if lighting an oversized barbecue, Mr. Joy sets fire to a kerosene-soaked rag and sticks it through a s opening in the furnace. "Three, two, one -- gas on," he shouts, as the flames burst into life.</p> <p>With this inferno of flames racing from dozens of gas jets, these workers are determining just how long the column and its fireproofing can hold up under this thermal assault.</p> <p>The result is a fire rating, expressed in hours, for this column, and eventually for countless different compor that make up a building, from sections of roofing to walls for emergency exit stairways to assemblies of g brick and plaster that make up a building facade. A column might be given a "two-hour" rating, meaning tl has withstood two hours in the furnace at temperatures that research done in the 1910's determined to be ty of office fires of the day.</p>
<p>John Mammoser</p>	<p>Probably expertise in computation or modelling of fires: (<a href="#">link</a>)</p> <p>“A computational study on the use of balconies to reduce flame spread in high-rise apartment fires</p> <p>John H. Mammoser III , , a and Francine Battaglia b”</p>

<b>WJE</b>	Ray Tide*	Dr. Raymond H. R. Tide has over 35 years of structural engineering experience involving steel structures has been a member of the AISC Specifications Committee for over 20 years. At the time of the design of WTC complex, he was involved in research concerning composite behavior of open-web steel joists as used in the WTC towers. Later he was involved in the development of column buckling studies including composite members comprised of angles. Subsequent to the 1994 Northridge, California earthquake, he was involved in numerous AWS- and FEMA-sponsored investigations on performance of steel structures and their connections. His experience includes evaluation of numerous fire-damaged steel structures and the evaluation of fractured structural steel. He has authored numerous technical papers in these areas.
	Conrad Paulson	<a href="#">Mr. Conrad Paulson</a> has over 25 years experience in laboratory testing, research and failure investigations of steel structures, structural components and structural materials. He has been involved in structural analysis and design and review of many highrise buildings, including wind load and gravity load analysis of the 84-story AON Center (formerly Amoco, and originally Standard Oil) building in Chicago. As consultant to the U.S. Department of State, he has performed post-earthquake reconnaissance and seismic structural analysis of highrise and lowrise buildings. He has participated in several major failure investigations, including the collapse of the New York State Thruway bridge over Schoharie Creek, and an analytical evaluation of a fire-damaged 38-story highrise structural steel building. His research and testing background includes studies for the National Cooperative Highway Research Program and others on elastic fatigue, inelastic fatigue, tensile properties and fracture of reinforcing steels.
	Jim Hauck	<a href="#">Mr. James J. Hauck</a> has significant experience in the structural analysis, design, detailing, and construction of midrise and highrise building structures. The analysis work has included extensive use of finite element analysis for strength and stability evaluation of multi-story frames, slab systems, and thin-shell domes. Mr. Hauck has investigated failures and problems in numerous buildings and other structures, including the evaluation of structures damaged by fire.

<b>RJA</b>	Ray Grill*	Mr. Raymond A. Grill, P.E. FSFPE, Principal Investigator, is the Senior Vice President for the Northeast of RJA, responsible for RJA operations in Boston, New York and Washington, D.C. He has practiced protection engineering for over 20 years. He served on the International Fire Code Performance Draft Committee and as Chair of the Fundamentals of Fire Alarm Systems technical committee of NFPA 72, National Fire Alarm Code. Mr. Grill was a co-Chairperson of the New York City Fire Alarm Code Revision Committee responsible for converting the committee's work into code language. He has extensive experience in development of comprehensive fire protection programs for major structures and the development of equivalencies to building and fire code requirements. He has published in a wide variety of fire protection publications including editing the Detection and Alarm Section of the 19th edition of the NFPA Fire Protection Handbook and a chapter of the recently published Handbook to the 2002 Edition of the National Fire Alarm Code. Mr. Grill is a registered Fire Protection Engineer and Mechanical Engineer. He is licensed in New York and in other states. He is a Fellow and member of the Board of Directors of the Society of Fire Protection Engineers.
	Ed Armm	In addition, Ed Armm President of the AFAANJ was awarded a Service Award for his outstanding contribution to AFAA and the fire alarm industry. ( <a href="http://www.afaanj.org/MeetingInfo/2008AnnualAFAAMeetingInfo/tabid/193/Default.aspx">http://www.afaanj.org/MeetingInfo/2008AnnualAFAAMeetingInfo/tabid/193/Default.aspx</a> )
	Tom Brown	Mr. Thomas Brown, P.E., is a Senior Vice President with responsibility for the Fairfax, Virginia, Office of RJA. He has extensive experience in the design of fire alarm systems for buildings and in-depth construction management experience in coordinating the installation of fire alarm, life safety, emergency communication fire alarm interfaces for smoke management, and fire suppression systems. Mr. Brown was heavily involved in the onsite investigation of the Meridian Plaza high-rise building fire that involved tracing of all fire alarm system conduits and devices to document system conditions prior to the fire and reviewing all documents relative to design and construction of the fire alarm system over the lifetime of the building.
<b>SGH</b>	Mehdi Zarghamee*	Dr. Mehdi Zarghamee is a Principal and Head of the Engineering Mechanics and Infrastructure Division at SGH and has 30 years of engineering experience in analysis and design of precision structures. He has been responsible for analysis, design, and failure investigation of complex structural and mechanical systems. Zarghamee has a doctorate in structural engineering from the University of Illinois and his S.M. in Mathematics from the Massachusetts Institute of Technology.
	Glenn Bell	Glen Bell, Principal and Chief Executive Officer, has been with SGH for 28 years. Mr. Bell specializes in structural failure investigations and has extensive experience in earthquake engineering, structural design and rehabilitation. He received his B.S. degree in Civil Engineering from Tufts University and his M.S. in Structural Engineering and Structural Mechanics from the University of California at Berkeley.

Said Bolourchi	Said Bolourchi, Staff Consultant, has 24 years of experience. His expertise is in risk assessment and failure analysis and evaluations including nonlinear dynamic analysis and response spectrum analysis of structures. Bolourchi received his B.S. in Mechanical Engineering from Queen Mary College, London, and his M.S. in Mechanical Engineering and Ph.D. in Applied Mechanics from the Massachusetts Institute of Technology.
Daniel W. Eggers	<a href="#">Likely to be finite element modelling</a>
Ömer O. Erbay	Dr. Omer Erbay is a Senior Engineer with SGH and has experience with the analysis of the structural response of the WTC towers to impact damage and fire conditions and structural analysis of buildings and bridge piers. Dr. Erbay has a doctorate in structural engineering from the University of Illinois.
Ron Hamburger	Ronald Hamburger, a Principal at SGH, has 28 years of experience in civil and structural engineering, damage and forensic investigations, engineering research, building code and standards development and project management. He was a member of the Building Performance Assessment Team that investigated the collapse of the World Trade Center Buildings in New York. Mr. Hamburger received his M.B.A. from Golden State University and his B.S. and M.S. from the Polytechnic Institute of New York.
Frank Kan	Frank Kan, a Senior Project Manager, has been with SGH for 16 years. He has been involved in structural seismic analysis, design, and investigation of buildings, bridges and special structures. Mr. Kan received his B.Eng. in Civil Engineering and Engineering Mechanics from McMaster University, Ontario, and his M.S. in Civil Engineering from the Massachusetts Institute of Technology. As Computation Manager, Mr. Kan was responsible for all computational aspects of the project as well as coordination between the SGH Computation Team and the CAEA Consultant Team.
Yasuo Kitane	<a href="#">Likely to be finite element modelling</a>
Atis Liepins	Atis Liepins, a Senior Associate has been with SGH for 25 years. He is an expert in the performance of finite element analysis, structural design, and failure analysis. Mr. Liepins received his S.B., S.M., and C.E. in Civil Engineering from the Massachusetts Institute of Technology.
Michael Mudlock	Michael Mudlock is an engineer with Simpson, Gumpertz & Heger Inc. He received his BS and MS in Civil Engineering from Lehigh University. ...
Wassim I. Naguib	Involved in modelling concrete flow/creep in <a href="#">one study</a>



Rasko P. Ojdrovic	<p>From: <a href="http://www.trenchlessonline.com/index/webapp-stories-action?id=375&amp;archive=yes&amp;Issue=2005-06">http://www.trenchlessonline.com/index/webapp-stories-action?id=375&amp;archive=yes&amp;Issue=2005-06</a>.  Rasko P. Ojdrovic, PhD., P.E., of Simpson Gumpertz &amp; Heger Inc., gave a presentation titled, PCCP De Failure Mechanisms and Forensic Investigations. The talk centered on the construction of PCCP pipes, strengths and weaknesses of both design and materials and ways of investigating and assessing pipe failure. PCCP can last a design lifetime with high reliability if properly maintained, he said.</p> <p>Also discussed were testing methods for identifying which pipes had significant wire breakage. A pipe structure, and structural analysis is essential to understanding its performance, said Ojdrovic.  Did a paper for/at <b>Lawrence Livermore Labs</b>:  <a href="http://www.osti.gov/bridge/servlets/purl/10143064-I90uhe/native/10143064.PDF">http://www.osti.gov/bridge/servlets/purl/10143064-I90uhe/native/10143064.PDF</a></p> <p><a href="#">This link</a> will show a list of papers he has contributed to.</p>
Andrew T. Sarawit	<p><a href="#">Developed a MATLAB program for Global Buckling Analysis of Thin-walled Members</a>  <a href="#">Also wrote a paper on load analysis</a> for Industrial Storage racks.</p>
Pedro Sifre	<p>Pedro Sifre, Senior Project Manager, has 16 years of experience in high-rise building design and optimization of lateral load resisting systems. He received his B.S. in Civil Engineering and his M.S. in Aeronautics and Astronautics from the Massachusetts Institute of Technology and his M.S. in Structural Engineering from University of California at Berkeley.</p>