

BRIAN J. MEACHAM, PhD, PE, FSFPE, CEng, FIFireE

Meacham Associates
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EDUCATION

Ph.D. (2000), Risk and Public Policy, Clark University, Worcester, MA

M.Sc. (1991), Fire Protection Engineering, Worcester Polytechnic Institute, Worcester, MA

B.Sc. (1984), Electrical Engineering, Worcester Polytechnic Institute, Worcester, MA

PROFESSIONAL REGISTRATION / CERTIFICATION

Professional Engineer (2007), Massachusetts, License No. 47238 (Fire Protection)

Chartered Engineer (2002), UK, Engineering Council Registration 519749, Institution of Fire Engineers

Professional Engineer (1993), Connecticut, License No. 17906

PROFESIONAL EXPERIENCE

Meacham Associates, Shrewsbury, MA (previously of Worcester, MA and Westborough, MA)

Managing Principal (1992-present). Founder of this fire protection engineering, risk and public policy, and management consulting firm. Fire protection engineering focus on: risk-informed performance-based approaches to fire safety analysis and design; egress and evacuation assessment and planning. Risk and public policy focus on: risk and building regulatory policy; risk-informed building and fire regulation; building regulatory capacity assessment. Management consulting focus on: assessment, characterization, communication and management of risk; business continuity and organizational resilience planning.

Worcester Polytechnic Institute (WPI), Worcester, MA

Associate Professor (with tenure, 2014 – 2017; untenured, 2008 - 2014). Taught and conducted research in areas of performance-based analysis and design for fire; post-earthquake fire performance of buildings; risk and building regulatory policy; fire risk assessment; human behavior and evacuation analysis; detection, alarm and smoke control.

Arup Americas, Inc. (Arup), Cambridge and Westborough, MA

Principal (2005-2007). Led the global Risk Consulting Practice, coordinating business, project and technical efforts across the Americas, European and Asia-Pacific regions for this 10,000 person firm, led the Risk & Security Practice and led the Corporate Consulting Business for the Americas region. Served on the Consulting Sector Executive of the Americas Board, which oversaw the \$30M consulting practice in North America, and served on the Global Management Consulting Executive, which oversaw the Management Business sector worldwide. Led and undertook risk consulting and fire consulting projects.

Associate Principal (2004). Led the global Risk Consulting Practice for this 10,000 person firm, coordinating business, project and technical efforts across the Americas, European and Asia-Pacific regions, and led the Risk Consulting Practice for the Americas region. Led and undertook risk consulting and fire engineering and consulting projects.

Principal Consultant (2000-2003). Developed and led risk consulting business in Americas. Led and undertook risk consulting and fire engineering and consulting projects.

Clark University, Worcester, MA, USA

Research Scientist, (2007-2013), George Perkins Marsh Institute

Research Associate Professor and Director, (2004 – 2007), Center for Risk and Security

Society of Fire Protection Engineers, Boston, MA and Bethesda, MD

Research Director (1998-2000). Responsibilities included identifying grant opportunities; developing and managing research program; undertaking research on risk-informed performance-based regulations and on performance-based fire safety analysis and design methods; identifying emerging fire protection engineering methodologies and tools; developing and implementing programs to integrate methodologies and tools into engineering practice; liaison with engineering and research organizations; publications and presentations.

Technical Director (1995-97). Served as catalyst in identifying, evaluating and implementing into practice emerging fire protection engineering methodologies. Responsibilities included identifying emerging fire protection engineering methodologies and tools; developing and implementing programs to integrate methodologies and tools into engineering practice; coordinating the activities of SFPE engineering committees; providing liaison with engineering and research organizations input to key SFPE publications; oral and written presentations.

FireTech, Meilen, Switzerland

Principal Fire Protection Engineer (1994-95). Co-founder. Provided a wide range of fire protection consulting services including analyses of existing fire and life safety conditions; performance-based fire hazard analysis and design using the principles of fire dynamics; computer fire simulations; fire related research; fire protection system design, evaluation and diagnostics; and building and fire code consultation. Also undertook business development, project acquisition and management, personnel supervision and business management functions.

Cerberus AG, Männedorf, Switzerland

Principal Fire Protection Engineer (1993). Fire protection consulting services, including fire and life safety analyses; fire hazard analysis; computer fire simulations; fire protection system design, evaluation and diagnostics; and building and fire code consultation.

FP&C Consultants, Inc., Newton, MA

Senior Associate, Fire Protection Engineer (1989-1992). Responsible for a variety of fire protection consulting functions including fire detection and alarm system design; fire suppression system design; detection and alarm system diagnostics; hazard, risk, fire and life safety analyses; building, fire and life safety code consulting; and fire investigation and reconstruction, as well as project acquisition and management.

Firepro Incorporated, Wellesley Hills, MA

Associate, Manager of the Detection and Alarm Group (1989). Developed consultation business pertaining to fire detection, alarm and emergency voice communication systems.

The Gamewell Corporation, Medway, MA and Franklin, MA.

Manager of the Systems Engineering Group (1988-89), responsible for Systems Engineering, Applications Engineering and Field Service for all detection and alarm system products.

Product Marketing Manager (1987), responsible for microprocessor-based FACP product.

Systems Engineering Manager (1986), responsible for multiplex and addressable fire alarm control panel product lines.

Systems Engineer (1985), responsible for fire detection and alarm system layout / design using addressable detector and multiplex control panel (microprocessor based) product line.

Applications Engineer (1984), responsible for fire detection and alarm system layout / design.

INTERNATIONAL APPOINTMENTS AND COMMISSIONS

Appointed Member, Project Technical Panel, FPRF Project – *Review of Use of Risk Terminology in NFPA Codes and Standards*, FPRF, April 2019 – December 2019.

Appointed Member, Project Technical Panel, FPRF Project – *Prototype Fuel Load Survey Methodology*, FPRF, January 2019 – December 2019.

Appointed Member, *International Review Panel, Building Standards (Fire Safety) in Scotland*, October 2017 - December 2018

Appointed Member, Project Technical Panel, FPRF Project – *High Rise Buildings with Combustible Exterior Wall Assemblies: Fire Risk Assessment Tool*, FPRF, July 2017 – June 2018.

Appointed as Senior Consultant, World Bank project, *Building Regulatory Capacity Assessment*, tool to assess building regulatory systems in low income countries, January 2017 – June 2018.

Appointed Member, Blue Ribbon Panel for Review of the *ASCE/SEI Manual of Practice: Structural Fire Engineering*, ASCE, July – August 2017

Appointed as Advisor, World Bank project, *Building Regulation for Resilience*, to increase the implementation of building regulatory systems in low income countries, May - November 2016

Appointed as Chair, United States Technical Advisory Group (US TAG) to the *International Organization for Standardization (ISO), Technical Committee (TC) 92, Sub-committee (SC) 4, Fire Safety Engineering*, December 2014 – 2018 (currently on hiatus from ISO leadership due to SFPE role).

Appointed as Chair, Fire Protection Research Foundation (FPRF), *Research Advisory Committee (RAC)*, August 2016. Member of the RAC, 2014 – 2018.

Appointed by the Singapore Minister of Economic Development to a team of International Experts charged to assist the Singapore Building and Construction Authority with a review of the building control system with a focus on structural safety, 2007.

Elected Chair, Inter-jurisdictional Regulatory Collaboration Committee (IRCC), a committee of the lead building regulatory agencies of thirteen countries who develop and promulgate performance-based building regulations (www.ircc.info), 2007-2010.

Appointed Chair, Risk and Security Advisory Committee, New York City Department of Buildings, New York, NY, 2003-2007.

Appointed to National Research Council Committee on *Developing a Performance-based Approach for Security-related Design of Federal Facilities*, Board on Infrastructure in the Constructed Environment (BICE), BICE project number BICE-J-00-02-A, 2000-2002.

Commissioned by the Australian Department of Industry, Science and Tourism to participate in an international review of the Australian Building Codes Board (April 1999).

Commissioned by the Australian Fire Code Reform Centre, Ltd. to participate in an international review of the Fire Code Reform Centre's research, product, scope and direction (1996 and 1998).

HONORS, AWARDS AND CERTIFICATES

Certificate of Appreciation – Society of Fire Protection Engineers – for service to the Society as Chair of the Standing Committee on Research, Tools and Methods (RTM) in 2016 and 2017, October 2018.

ICC 2017 Global Award - Given by the ICC Global Membership Council to individuals or organizations with outstanding performance in promoting building safety in the world and supporting ICC carry its global mission. The award is in recognition of the contributions to building safety done through your research and publication of scholarly papers on Performance Codes and in innovative Fire Protection systems, thus furthering the Code Council's global mission and vision.

The Society of Fire Protection Engineers (SFPE) Harold E. Nelson Service Award – The SFPE Board of Directors created the Harold E. Nelson Service Award in 1987 to recognize dedicated and inspired service to the ideals and goals of the Society. The award is named after Harold E. "Bud" Nelson, P.E., whose unparalleled fire protection engineering and Society careers are truly worthy of emulation. July 2016.

Fulbright Global Scholar – Awarded one of 19 prestigious, inaugural, Fulbright Global Scholar Awards by the Institute of International Education, Council for International Exchange of Scholars (CIES). This program supports scholars to conduct research and/or teach in from one to three countries, over a period of one to three years (see <http://www.cies.org/program/fulbright-global-scholar-award> and <http://www.cies.org/fulbright-global-award-scholars>), June 2016.

Certificate of Appreciation – Society of Fire Protection Engineers – for service to the Society as a member of the Board of Directors, 2009 – 2015, October 2016.

Fellow – Institution of Fire Engineers (IFE) – Elected “in recognition of your significant and sustained contributions to the field of fire engineering and the fire service,” February 2014.

SFPE “Hat’s Off” Award – “For your efforts and service to the Society of Fire Protection Engineers,” October 18, 2009.

Certificate of Appreciation – Asociación de Profesionales de Ingeniería de Protección contra Incendios (APICI), for “many years of service and dedication to the support of the Spanish fire safety engineering community,” February 2009.

Certificate of Appreciation – Inter-jurisdictional Regulatory Collaboration Committee (IRCC), for “dedication to the global advancement of performance-based building codes,” Nov. 2003.

Honorary Member – Salamander Fire Protection Engineering Honorary Society, November 2001.

Fellow – Society of Fire Protection Engineers – Elected “in recognition of significant accomplishment and stature in engineering,” May 2000.

NCSBCS Best Paper Award – “A Performance-Based Building Regulatory System: Providing a Means to Streamline the Building Regulatory Process, Promote Innovation in the Construction Industry, and Improve International Economic Competitiveness,” *The NCSBCS/NIST/HUD Joint Technical and Research Conference: Innovations in the Construction Industry and Building Regulatory Process*, December 1998.

SFPE “Hat’s Off” Award – development of SFPE short course, performance-based fire detection system design, October 1994.

REPRESENTATIVE CONSULTING PROJECTS

Meacham Associates (2008 – present)

Fire Protection Research Foundation (Quincy, MA). Contracted in partnership with Lund University and Zurich Insurance Plc to conduct research on *Review of Oxygen Reduction Systems for Warehouse Storage Applications - Phase 2 – Fire Test Method Development* (November 2019 – June 2021).

Qatar Civil Defence (Doha, Qatar). Contracted with JVVA (Madrid, Spain) to deliver courses on review of performance-based designs (October – November 2019).

Fire Protection Research Foundation (Quincy, MA). Research project to conduct a literature review on *Fire Safety Challenges of Green (Sustainable) Buildings* (November 2019 – May 2020).

World Bank (Washington, DC, USA). Contracted to develop a fire risk assessment and risk mitigation financing estimation tool (July 2019 -).

World Bank (Washington, DC, USA). Contracted to provide ‘high-level’ review of draft building codes of Malawi and Uganda (May - July 2019).

Knauf Insulation (Vise, Belgium). Contracted to provide expert services related to building regulatory requirements for fire safety and associated standardized fire test methods (April 2019 -).

Lund University (Lund, Sweden). Subcontractor on Fire Protection Research Foundation project on development of a *Research Roadmap for Environmental Impacts of Fire* (April – December 2019).

APICI (Madrid, Spain). Assistance with program for 10th International Conference on Performance-Based Fire Safety Engineering, 25-27 September 2019, Madrid, Spain (February – October 2019).

TNO - Technical Research Organization of the Netherlands (Delft, the Netherlands). Contracted to provide expert consulting services on human behavior and evacuation at airports (January 2019 –)

Port Authority of New York and New Jersey, (New York, NY). Contracted (via Mott MacDonald) to provide fire safety peer-review services for a historic airport terminal project (Dec 2018 – Jan 2019)

American Association of Insurance Services (Lisle, IL). Contracted to provide expert consultation on fire service response / data for insurance rating tool (May 2018 –)

Fire Protection Research Foundation (Quincy, MA). Contracted in partnership with Lund University and Zurich Insurance Plc to conduct research on *Review of Oxygen Reduction Systems for Warehouse Storage Applications* (May – November 2018).

Port Authority of New York and New Jersey, (New York, NY). Contracted (via Mott MacDonald) to provide peer-review services for a performance-based design of a high-hazard facility (March 2018 –)

International Code Council (Washington, DC). Development of a booklet on the benefits of building codes for increasing community resiliency (March – September 2018).

Scottish Government, Building Standards Division (Edinburgh, Scotland). Contracted to conduct research into the options for a centralized hub for verification of fire engineering designs (February – June 2018).

CECSI (A Coruna, Spain). Contracted to assist in the development of the 3rd International Conference on Safety in Ports, 8-9 May 2018, A Coruna, Spain (February – May 2018).

Scottish Government, Building Standards Division (Edinburgh, Scotland). Contracted to conduct research on the suitability of select standardized fire test methods as cited in the Building Standards and Technical Handbooks (February – April 2018).

Scottish Government, Building Standards Division (Edinburgh, Scotland). Contracted to serve as International Expert on Review Panel for Building Regulations (Fire) following the Grenfell Tower fire (January – October 2018).

APICI (Madrid, Spain). Assistance with program for 9th International Conference on Performance-Based Fire Safety Engineering (August – October 2017).

Australian Building Codes Board (Canberra, ACT, Australia). Contracted to develop report on threshold tolerable risk levels for inclusion into the National Construction Code (August 2017).

Scottish Government, Building Standards Division (Edinburgh, Scotland). Contracted to make recommendations on a professional qualification system for verifiers (February 2017 –).

World Bank (Washington, DC). Engaged as Senior Consultant to the World Bank, *Building Regulation for Resiliency* project, to develop building regulatory capacity assessment approach for low- and middle-income countries (December 2016 –).

SP Fire Research (Trondheim, Norway). Contracted to review draft Nordic risk-based fire safety engineering standard (August 2016).

Scottish Government, Building Standards Division (Edinburgh, Scotland). Contracted to review fire safety provisions in the building regulations and to review and make recommendations on a professional qualification system for fire safety engineers (June – August 2016).

Australian Building Codes Board (Canberra, ACT, Australia). Contracted to research and develop discussion paper on establishment of tolerable risk levels (individual and societal) for inclusion into the National Construction Code of Australia (January – March 2016).

Ministry of Business, Innovation and Employment, Buildings Housing and Information Division (Wellington, NZ). Contracted to provide research and expert input on the next generation fire engineering compliance document, quantification of risk and performance, and next generation framework for performance-based Building Code of New Zealand (January – May 2016).

Parsons Brinckerhoff, Inc. (New York / Atlanta). Contracted to review the CFD modeling methodology report; prepare a review report summarizing findings arising from the review; provide technical support to PB with FHRR profile (January – December 2016).

Ministry of Business, Innovation and Employment, Buildings Housing and Information Division (Wellington, NZ). Contracted to provide external review of fire Verification Methods and Acceptable Solutions in the New Zealand Building Code (October 2014 – June 2015).

APICI (Madrid, Spain). Assistance with program for 8th International Conference on Performance-Based Fire Safety Engineering (January – February 2015).

Fire Protection Research Foundation (Quincy, MA). Contracted to co-author a chapter as part of the NIST Research Roadmap for SMART Firefighting (July – December 2014).

Australian Building Codes Board (Canberra, ACT, Australia). Contracted to review risk approach in WaterMark plumbing products approval scheme (April – June 2014).

Ministry of Business, Innovation and Employment, Buildings Housing and Information Division (formerly Department of Building and Housing) (Wellington, NZ). Contracted to provide input and review on risk-based building code provisions (April – June 2014).

Adventis Ingeniria / AFITI / APICI (Madrid, Spain). Assistance with program for 7th International Conferences on Performance-Based Fire Safety Engineering (2013).

Ministry of Land, Infrastructure, Transportation and Tourism (Tokyo, Japan) Expert Panel Member - input on the next generation performance-based building code for Japan (2013).

Studio di Architettura (Milan, Italy) and Novartis (East Hannover, NJ). Code consulting and fire engineering alternatives analysis for parking garage. (2012).

Department of Building and Housing (Wellington, NZ). Review of risk-informed performance-based building regulatory approach for earthquake design (August – September 2012).

Ministry of Land, Infrastructure, Transportation and Tourism (Tokyo, Japan) Expert Panel Member, providing input on the next generation performance-based code for Japan (2011).

Adventis Ingeniria / AFITI / APICI (Madrid, Spain). Assistance with program for 6th International Conferences on Performance-Based Fire Safety Engineering (2011).

TNO (the Netherlands). Expert consultant for development of approach to next-generation building regulations and testing of concepts within a TNO workshop on sustainability (2010).

International Code Council (Washington, DC). Expert consultant on development of *Performance-Based Guidelines for the Design and Construction of UNDG Common Premises Office Buildings* for the United Nations Development Group (2010-2012).

SNIP Register, Inc. (Chicago, IL). Expert Consultant for review of Guidelines for Eurocode Adoption in Kazakhstan (2010).

Department of Building and Housing (Wellington, NZ). Contracted to conduct a strategic assessment of the strengths and weaknesses of the New Zealand building control regulatory system (2009).

Department of Building and Housing (Wellington, NZ). Contracted to draft and edit international summary document on performance-based building regulations (2009).

Australian Building Codes Board (Canberra, ACT, Australia). Contracted to provide a review / comparison of risk/safety levels of buildings constructed to AS3959-1999 and -2009 (2009).

Adventis Ingeniria / AFITI / APICI (Madrid, Spain). Assistance with program for 5th International Conferences on Performance-Based Fire Safety Engineering (2009).

Tyco Fire Suppression and Building Products (Cranston, RI). Appointed member of expert panel to provide input on next generation fire suppression systems (2009).

National Institute of Building Sciences (Washington, DC). Peer review of approach to fire ignition frequency following earthquakes (2009).

Ministry of Land, Infrastructure, Transportation and Tourism (Tokyo, Japan) Expert Consultant, developer and editor of international summary document on the principles of, and experience with, performance-based building regulations (2008-2009).

National Research Council, Institute for Research in Construction (Ottawa, Canada). Expert Consultant, developer and editor of international summary document on the principles of, and experience with, performance-based building regulations (2008-2009).

Applied Technology Council (Redwood City, CA). Member of Project Steering Committee on FEMA-funded project to develop performance-based seismic design guidelines (2008 - 2012).

Department of Building and Housing (Wellington, NZ). Consultant for review of performance-based Building Regulations of New Zealand, with a particular focus on use of risk as a basis for establishing performance levels and establishment of performance criteria for fire (2008).

Arup (Westborough, MA). Expert Consultant for FRA of an electrical power utility (2008).

Representative Projects Conducted While Employee of Arup (2000 – 2007)

Confidential Client. Principal-in-Charge for a call-in risk and security consulting / advisory services contract for a major regional government agency in the Northeast USA, whose holdings include airports, rail, ports, bridges, tunnels, stations and buildings. (2007)

Aedas / Marina Bay Sands (Singapore). Project Director and Principal Risk Consultant leading a comprehensive threat, vulnerability and risk assessment for the design of the Marina Bay Sands Integrated Resort in Singapore. (2006-2007)

Confidential Client. Security, Terrorism, Fire and Life Safety advisor for a design team which is developing the design for a super-tall building. Advise on issues of structural response to extreme events and strategies for fire and life safety in super-tall buildings. (2006-2007)

Transurban (Australia and USA). Principal-in-Charge for risk consulting project aimed at identifying and understanding natural hazards, technological hazards, deliberate events, and operational risks associated with operation of a toll highway, for the purpose of estimating PML and MFL, mitigating and controlling risk, and advising on insurance. (2006-2007)

SonoSite (Bothell, WA). Project Director for this effort to assess and update the Business Continuity Plan and to develop Emergency Response and Recovery and Crisis Communication and Management plans for this manufacturing facility. (2006)

Department of Building and Housing (Wellington, NZ). Expert Consultant on the review of performance-based Building Regulations of New Zealand, with a particular focus on use of risk as a basis for establishing performance levels and establishment of performance criteria. (2006)

Australian Building Codes Board (Canberra, Australia). Expert Consultant on the review of Building Code of Australia (BCA) with a focus on use of risk as a basis for establishing performance levels, and establishment of performance criteria for fire and life safety. (2006)

Public Utilities Commission (San Francisco, CA). Technical Advisor on project to review, consolidate and expand emergency response and recovery plans for a large water utility. (2006)

Confidential Client. Project Director for a comprehensive review of hazards and risks associated with new corporate headquarters building, and for the development of a report on risk mitigation. (2006)

Valley Metro RTPA (Phoenix, AZ). Project Director, Regional Safety and Security Plan for Valley Metro Regional Public Transportation Authority. Development of agency and public involvement plans, review of past TRVAs, review of transit operation, and development of a regional safety & security plan. (2006)

VTT (Espoo, Finland). Serve as Senior Advisor on risk and security issues in buildings. Conducted research on sheltering for CBRN threat scenarios. (2006)

University of Massachusetts (Amherst, MA). Project Director for a campus-wide security review, which encompassed the identification and review of current campus security systems, procedures and staffing, and provided options to enhance effectiveness of security systems, procedures and organization. (2006)

Valley Metro RTPA (Phoenix, AZ). Project Director for a threat and vulnerability assessment (TVA) of specific Valley Metro facilities in the Phoenix area. (2005)

Bay Area Rapid Transit, (San Francisco, CA). Principal Risk Consultant for review of BART Security Criteria for systems and stations. (2005)

New York City Transit, (New York, NY). Principal Risk Consultant for a comprehensive Threat and Risk Assessment (TARA) for the South Ferry Terminal redesign project. (2003-2006)

New York City Transit, (New York, NY). Principal Risk Consultant for the design of the \$750 Million Fulton Street Transit Center in lower Manhattan. Led Threat and Risk Assessment (TARA) and project risk assessment and management effort, including developing a Risk and Opportunities register for estimating and tracking project financial risks. (2003-2006)

Port Authority of New York and New Jersey, (New York, NY). Principal Risk Consultant for a proposed facility in lower Manhattan. Led a Threat and Risk Assessment (TARA) for defined areas. (2002-2004)

Confidential Client. Principal Risk and Fire Consultant for an effort which developed a stochastic fire loss prediction model. (2004)

Tappan Zee Bridge Replacement Options Assessment, NY State Thruway Authority (Albany, NY). Principal Risk Consultant for this \$15 Million effort aimed at assessing options for maintaining, rehabilitating, modifying and/or replacing the Tappan Zee Bridge. Risk analysis responsibilities include co-development of a FMECA to determine risk-significant factors, and a risk-cost decision model for assisting in decision-making for options considered. (2002-2006)

American Institute of Steel Construction, Inc. (Chicago, IL). Project Director for effort to help the AISC develop a long-term strategic plan for the integration of structural and fire protection engineering for the performance-based fire design of steel structures. (2003-2004)

Miami International Airport, Rental Car Facility, (Miami, FL). Principal Risk & Fire Consultant for this \$40 Million project to design and construct a consolidated rental car facility at the Miami International Airport. System safety assessment and performance-based fire and life safety analysis of facility with 120 interior fuel-dispensing stations. (2000-2008)

Briggs & Morgan (Minneapolis, MN). Testifying expert in litigation involving a natural gas explosion and subsequent deaths. (2003)

Buildings Department (Hong Kong, SAR, China). Principal Risk & Policy Consultant / Principal Fire Engineering Consultant for this \$1.2 Million project to study and recommend a fire engineering approach and PB fire safety objectives for the HK Building Code. (2000-2003)

NYCT, 2nd Avenue Subway (New York, NY). Principal Risk Consultant for this estimated \$16 Billion project to design and construct 8 miles of new subway, with 16 new stations, under 2nd Avenue in New York City. Included supporting the design and project management teams on system safety management planning, hazard, risk and reliability assessments, and project management risk management. (2001-2003)

Applied Technology Council (Redwood City, CA). Associate Team Leader - Risk, for the project ATC 58 – Development of Performance-Based Seismic Design Guidelines, which is a Federal Emergency Management Agency (FEMA) funded effort of the Applied Technology Council (ATC). (2001-2006)

Ratcliffe Building (Charlotte, NC). Principal Fire Consultant for this project, which involves integrating a 2-story historic building into a high-rise mixed-use building. Responsible for performance-based fire protection analysis and design. (2002)

Bay Area Rapid Transit, (San Francisco, CA). Principal Fire Consultant on this research and analysis project to determine egress criteria and methods for use in the performance-based fire and life safety analyses of underground and above ground transit stations. (2001)

San Mateo Transportation District (San Mateo, CA). Principal Risk Consultant for assessment of critical exposures to help the District identify appropriate insurance coverage. (2001)

SLC International Airport, (Salt Lake City, Utah). Assisted in the development of the performance-based fire safety strategy for planned expansion. (2000)

JFK International Airport, (New York, NY). Reviewed PB fire safety analyses. (2000)

Pennsylvania Station, (New York, NY). Reviewed performance-based fire safety analysis and design concepts for this historically significant central rail station. (2000)

Dobson Ice Arena, (Vail, CO). Reviewed the performance-based analyses of smoke control, egress, passive fire protection, fire detection, and fire suppression systems. (2000)

Dia Gallery, (New York, NY). Review performance-based fire safety analysis and design concepts for this culturally significant museum. (1999)

Representative Projects with FireTech and Cerberus, Switzerland (1992 – 1995)

Sandoz (Switzerland). Recommended modifications to fire safety standards and procedures for chemical warehouse facilities. The focus was to identify a performance-based approach as an alternative to prescriptive requirements in force at the time. (1994-1995)

ITT Sheraton (Italy, United States). Undertook fire and life safety evaluations of several ITT Sheraton hotels in Florence, Rome, and Venice Italy and developed conceptual design requirements and planning budgets. (1994-1995)

Beznau Nuclear Power Plant (Switzerland). Undertook fire hazard and qualitative risk analyses of non-nuclear parts of a nuclear power plant and developed a fire safety master plan to address hazards and risks. Analysis included evaluation of basic defense in depth strategies, prevention, detection and suppression, and containment, as well as programmatic issue such as training, maintenance and fire brigade capability. (1993-1994)

Tungsram / G.E. Lighting (Hungary). Undertook fire hazard and qualitative risk analyses of five light bulb manufacturing facilities and developed a fire safety master plan to address hazards and risks. Conceptual design strategies were developed. (1993-1994)

Representative Projects with FirePro, FP&C Consultants and Meacham Associates (1989-1992)

Westover Air National Guard Base (United States). Provided fire detection analysis and design services for fuel pump house at Air National Guard base. (1992)

National Research Council Canada (Canada). Provided analysis and recommendations on fire detection features for use with fine water mist systems for computer rooms. (1992)

U.S. Department of Veterans Affairs (United States). Provided analysis and design services for fire detection and alarm system requirements at the Manchester, NH, Bedford, MA, and Providence, RI, DVA medical facilities. FSES for Brockton, MA, DVA facility. (1989-1992)

U.S. General Services Administration (United States). Provided fire safety evaluations of federally owned and leased buildings, using the NFPA 101M FSES approach, throughout GSA Region 7. This involved evaluation of buildings in CO, LA, OK, SD, and TX. (1989-1992)

G.E. Plastics (United States). Provided fire detection and alarm system consulting services for large plastics manufacturing facility in Indiana. (1989-1991)

National Archives (Canada). Provided fire detection and alarm system consulting services for historically and culturally significant property. (1989)

101 Federal Street, Boston (United States). Performed fire safety evaluation and code consulting services. (1989)

ITT Sheraton (United States). Developed *ITT Sheraton Guidelines for Fire Detection, Alarm and Signaling Systems* (1989-1990)

MEMBERSHIPS AND OFFICES HELD IN PROFESSIONAL SOCIETIES

Current Professional Society Membership and Offices

International Association for Fire Safety Science (IAFSS), Member

- Management Committee Member (2014 – 2020)
- Honorary Secretary, Member of Executive Committee (2017 – 2020)

Interjurisdictional Regulatory Collaboration Committee (IRCC), Founding Member

- Member (1997 –)
- Chair (2007-2010)

Institution of Fire Engineers (IFireE), Chartered Engineer (CEng), Fellow

Society of Fire Protection Engineers (SFPE), Fellow

- Board of Directors (2009-2015; 2018-2020)
 - Immediate Past-President (2020)
 - President (2019)
 - President-Elect (2018)
 - Vice President (2015)
 - Member, Executive Committee (President's Appointee, 2010-2014)
 - Member, Finance Committee (2010-2011, 2013)
 - Member, Compensation Committee (2010-2014)
 - Board Liaison to European Chapters (2011-2014)
 - Member, Higher Education Task Group (2009-2014)
 - Chair, Search Committee for Executive Director (2009)
 - Member, Search Committee for Executive Director (2013)
 - Chair, Task Group on International Professional Recognition and Training (2012-2014)

Past Professional Society Membership and Offices

American Society of Safety Engineers (ASSE), Professional Member

Institute of Electrical and Electronics Engineers (IEEE), Member

Institute of Management Consultants (IMC), Member

Society for Risk Analysis (SRA), Member

ENGINEERING GUIDANCE, CODES AND STANDARDS DEVELOPMENT COMMITTEES

Current Committees

American Society of Testing and Materials (ASTM)

- ASTM E0.5, Fire Standards, Subcommittee E05.44, Fire Safety Engineering, Member

International Organization for Standardization (ISO)

- ISO TC 92 SC 4, Fire Safety Engineering, U.S. Technical Advisory Group, Expert

National Fire Protection Association (NFPA)

- NFPA Technical Committee on Fire Risk Assessment, Chair

Previous Engineering Guidance, Codes and Standards Development Committees

American Institute of Steel Construction (AISC)

- AISC Fire Safety Engineering Committee, Member
- AISC Specifications Committee – Sub-Committee on Thermal Effects (TC 8), Member

American Society of Civil Engineers (ASCE)

- ASCE 7, Standards Committee, Sub-Committee 1 – General Requirements, Member

American Society for Testing and Materials (ASTM)

- ASTM E05 Fire Standards, Member
- ASTM E06 Performance of Buildings, Member
- ASTM E54 Homeland Security Applications, Member

International Council for Research and Innovation in Buildings (CIB)

- CIB Working Commission 14 – Fire, Member
- CIB Task Group 37 – Performance-Based Building Regulatory Systems, Member
- CIB Task Group 50 – Tall Buildings, Member
- CIB Task Group 11 – Performance-Based Codes, Member
- CIB W14 – Task Group on Identification of Uncertainties in Fire Safety Engineering, Chair

International Code Council (ICC)

- ICC Industry Advisory Committee, Member
- ICC Performance Code Development Committee, Member
- ICC Code Technology Committee – Member

National Fire Protection Association (NFPA)

- NFPA 101, Correlating Committee Task Group on Performance-Based Design, Member
- NFPA 101A, Task Group on Engineering Evaluation of Building Fire Safety, Member
- NFPA 72 Committee on Protected Premises Signaling Systems, Member
- NFPA 72 Committee on Testing and Maintenance of Signaling Systems, Member
- NFPA 72 Committee on Initiating Devices for Protective Signaling Systems, Member
- NFPA Committee on Atomic Energy, Member
- NFPA Committee on Alternative Protection Options to Halon, Member
- NFPA Task Group on High Voltage DC Converter Station Fire Protection, Member
- NFPA Member Advisory Council, Member

Society of Fire Protection Engineers (SFPE)

- Chair, Committee on Research, Technology and Methods (RTM) (2016-2018)
- SFPE Standards Making Committee on Calculating Fire Exposures to Structures, Member
- SFPE Engineering Task Group on Computer Model Evaluation, Staff Liaison
- SFPE Engineering Task Group on Engineering Practices, Staff Liaison
- SFPE Engineering Task Group on Performance-Based Design, Staff Liaison
- SFPE Engineering Task Group on Building Code Liaison, Staff Liaison
- SFPE Education Committee, Member
- SFPE Research Committee, Member

EDITORIAL APPOINTMENTS

Member, *Springer Editorial Advisory Board for Fire Publications*, June 2016 –
Editor, *Handbook of Environmental Impacts of Fire*, Springer, December 2016 –
Editor, *Case Studies in Fire Safety*, August 2015 – January 2017 (stopped by publisher in 2017)
Guest Editor, Special Edition: Fire Safety Engineering, *Journal of Building Engineering*, 2015-2016
Editorial Board, *Fire Technology* (G. Rein, Editor), 2014 –
Editorial Board, *Journal of Fire Protection Engineering* (R. Alpert, Editor), 2008-2013.
Editorial Board, *Fire Science Reviews* (C. Beyler, Editor), 2011 – 2017 (stopped by publisher in 2017)
Editorial Board, *Fire Protection Engineering – European Edition*, Society of Fire Protection Engineers (J. Jonsson, Editor), 2016 –

GRANT AND JOURNAL REFEREE SERVICES**Referee / Reviewer for Grant Proposals**

Department of Homeland Security (DHS), Washington, DC (2 proposals)
Ministry of Science + Innovation (MSI), New Zealand (5 proposals)
Research Grants Council (RGC), Hong Kong (2 proposals)
Maryland Industrial Partnerships, Maryland, USA (1 proposal)
John Jay College of Criminal Justice, NY, USA (1 proposal)

Referee / Reviewer for Peer-Review Journal Articles

Automation in Construction (1 paper)
Case Studies in Fire Safety (3 papers plus 15 as Editor)
Building and Environment (1 paper)
Building Research & Information (6 papers)
Facilities (1 paper)
Fire and Materials (7 papers)
Fire Safety Journal (14 papers)
Fire Science Reviews (1 paper)
Fire Technology (17 papers)
International Journal of Law and the Built Environment (1 paper)
International Journal of Lifecycle Performance Engineering (2 papers)
Journal of Building Engineering (2 papers plus 8 as Special Edition Editor)
Journal of Critical Incident Analysis (1 paper)
Journal of Engineering (1 paper)
Journal of Fire Protection Engineering (4 papers)
Journal of Infrastructure Systems (1 paper)
Risk Analysis (1 paper)
Smart and Sustainable Built Environment (2 papers)
Sustainable Cities and Society (2 papers)
Sustainability: Science, Practice, & Policy (1 paper)
Transportation Research (1 paper)
Tunneling and Underground Space (1 paper)

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7. Meacham, B.J., Editor, *Performance-Based Building Design Concepts*, International Code Council, Falls Church, VA, July 2004.
8. Custer, R.L.P. and Meacham, B.J., *Introduction to Performance-Based Fire Safety*, NFPA, Quincy, MA, June 1997.
9. Meacham, B.J., *The Evolution of Performance-Based Codes and Fire Safety Design Methods*, SFPE, Boston, MA, August 1996.
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11. *ITT Sheraton Guidelines for Fire Detection and Emergency Voice Alarm Communication Systems*, ITT Sheraton Corporation, Boston, MA, USA, 1993.

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1. Meacham, B.J., "Sustainability and resiliency objectives in performance building regulations," in *Building Governance and Climate Change Regulation and Related Policies*, edited by Richard Lorch, Jacques Laubscher, Edwin Hon-wan Chan, Henk Visscher, Routledge, London, 2018.
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4. Meacham, B.J., "A Brief Overview of the Building Regulatory System in the United States," Chapter 9, in Stollard, P., Ed., *Fire from First Principles*, 4th Edition, Routledge, London, 2014.
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47. Meacham, B.J., “Assessment of the Technological Requirements for Realization of Performance-Based Fire Safety Design in the United States,” GCR 98-761, NIST, Gaithersburg, MD, 1998.
48. Meacham, B.J., “Concepts of a Performance-Based Building Regulatory System for the United States,” GCR 98-762, NIST, Gaithersburg, MD, 1998.
49. Meacham, B.J., “The Evolution of Performance-Based Codes and Fire Safety Design Methods,” GCR 98-763, NIST, Gaithersburg, MD, 1998.
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1. Meacham, B.J., “Sustainable and Fire-Resilient Design of High-Rise Buildings,” *Life Safety Digest*, FCIA, September 2019.
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3. Meacham, B.J., "A conceptual approach using risk as a basis of building performance design," *Risk Frontiers Newsletter*, Volume 16, Issue 2, December 2016 (available on-line at <https://riskfrontiers.wordpress.com/2016/12/05/newsletter-volume-16-issue-2-december-2016/>)
4. Meacham, B.J., "Environmental Impacts of Fire," *Fire Protection Engineering Magazine*, Society of Fire Protection Engineers, March 2016.
5. Meacham, B.J., "Performance-based building regulations – a global perspective," *Building Safety Journal*, International Code Council, Washington, DC, Fall 2015.
6. Meacham, B.J., Kim, J.K. and Park, H., "Earthquake and Post-Earthquake Fire Performance," *Fire Protection Engineering*, Penton / Society of Fire Protection Engineers, Issue 82, March 2014.
7. Meacham, B.J., "An Overview of Approaches and Resources for Building Fire Risk Assessment," *Fire Protection Engineering*, Penton / Society of Fire Protection Engineers, August 2013.
8. Dembsey, N.A., Meacham, B.J., Schebel, K., Johann, M., Tubbs, J. and Alston, J. (2012). "Fire Spread: How a simplified flame spread model, integrated with CFD tools, can enable a go/no-go screening approach for assessing material flame spread potential," *Marine Technology*, July 2012.
9. Tubbs, J. and Meacham, B.J., "Selecting Appropriate Egress Strategies," *Consulting and Specifying Engineer*, Reed Elsevier, 2008.
10. Meacham, B.J., "Lessons to be Learned from Building Codes in Other Countries," *Building Safety Journal*, March 2008, 20-23.
11. Hadden, J.D., Johann, M. and Meacham, B.J., "Building Design for Extreme Events: Blast Events," *Structure*, Vol. 14, No.1, January 2007.
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14. Meacham, B.J., "Global Policy Summit on Performance-Based Building Regulatory Systems," *Building Safety Journal*, Volume 2, Number 3, May-June 2004, 29-34.
15. Meacham, B. J., "Etter World Trade Center: Hva betyr erfaringene for byggereglene og brannteknikk (World Trade Center Collapse: Potential Impacts on Building Codes and Fire Engineering)," *Bedagene Nytt*, Statens Bygningstekniske Etat, Oslo, Norway, April 2003, 28-29.
16. Meacham, B.J., "Addressing Risk and Uncertainty in Performance-Based Fire Protection Engineering," *Fire Protection Engineering*, Spring 2001, 16-25.
17. Meacham, B.J., "Analyzing Fire Risks Building by Building," *Architectural Record*, McGraw-Hill, NY, May, 2000, 293-304.
18. Meacham, B.J., "Update on SFPE Engineering Task Group Activities," *SFPE Bulletin*, SFPE, Boston, MA, Fall 1997.
19. Meacham, B.J., "Concepts of a Performance-Based System for the United States," *SFPE Bulletin*, SFPE, Boston, MA, Fall 1997.
20. Meacham, B.J., "Performance-Based Building and Fire Regulatory Development Activities in the United States," *Face Au Risque*, Paris, France, October 1997.
21. Meacham, B.J., "Update of SFPE Task Groups," *SFPE Bulletin*, SFPE, Boston, Winter '96-'97.
22. Meacham, B.J. and Richardson, J.K., "How the Society of Fire Protection Engineers is Addressing International Issues in Fire Safety Engineering," *SFPE Bulletin*, SFPE, Boston, MA, Fall 1996.

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24. Capaul, T., Meacham, B.J. and Sica, G., “Un nuovo metodo per la protezione degli edifici storici (A New Method for the Protection of Historical Structures),” *anti furto*, Rome, Italy, June 1996.
25. Meacham, B.J. and Lucht, D.A., “Performance-Based Fire Safety Design: An Update from the Society of Fire Protection Engineers,” *Plant Services*, Vol. 17, No. 1, January 1996.
26. Meacham, B.J. and Lucht, D.A., “Performance-Based Fire Safety Design in the United States: An Update from the Society of Fire Protection Engineers,” *SFPE Bulletin*, SFPE, 1995.
27. Meacham, B.J., “International Development and Use of Performance-Based Building Codes and Fire Safety Design Methods,” *SFPE Bulletin*, SFPE, March/April 1995.
28. Meacham, Brian J., “Fire Research in Europe: A Look at European Fire Safety Seminars, Conferences and Workshops in 1993,” *SFPE Bulletin*, SFPE, March/April 1994.
29. Capaul, T., Meacham, B.J. and Sica, G., “Resistenza Antincendio di Un Impianto di Generalizione con Motore Diesel (Structural Fire Resistance Analysis of a Diesel Engine Driven Power Generating Plant),” *Antincendio*, No. 2, Ministero dell'Interno, Rome, Italy, Feb. 1994.
30. Meacham, Brian J., “Sounding the Alarm for Fire Detection,” *Best's Review, Property -Casualty Insurance Edition*, Vol. 92, No. 10, February 1992.

PUBLICATIONS IN DEVELOPMENT

Journal Articles in Development – Peer-Reviewed Full Manuscripts

1. Wang, H., Dembsey, N.A. and Meacham, B.J., “Recognition of the Building Fire Performance Gap,” in development, to be submitted to *Fire Safety Journal*
2. Leiras, A.B., Rodrigues, J.P.C. and Meacham, B.J., “A New Performance-Based Methodology for Fire Risk Assessment,” in development, submitted to *Safety Science*
3. Kamath, P., Dembsey, N. and Meacham, B.J., “Full-Scale Non-Standard Load-Bearing Fire tests on Gypsum-Sheathed Wood-Frame Systems,” Manuscript no. FISJ_2018_255, submitted to *Fire Safety Journal*, July 2018.
4. Meacham, B.J. and van Straalen, I.J.J., “A Roadmap for Quantification of Risk as a Basis for Performance Objectives in Building Regulation,” in development.
5. Kamath, P., Dembsey, N. and Meacham, B.J., “Fire Performance of Structural Insulated Panel Frame Systems Compared with Traditional Dimensional Lumber Framing,” in development for *Journal of Structural Fire Engineering*.
6. Meacham, B.J. “Comparative Analysis of Performance-Based Building Regulatory Systems in Seven Countries,” in development.
7. Meacham, B.J. and van Straalen, I., “Criteria and Methods for Risk-Informed Performance-Based Fire Regulation and Design,” in development.
8. Meacham, B.J., “Challenges with Enforcement of Performance-Based Building Regulations,” in development.

Handbooks in Development

1. *Handbook of Environmental Impacts of Fire*, Brian J. Meacham, Editor, Springer, planned publication, August 2021.

FELLOWSHIPS, GRANTS AND GIFTS AWARDED**Grants Summary**

Awards	Year	Value	Comments
FPRF Award - Safety Challenges of Green Buildings – Phase 2, PI	2020	\$25,000	PI, with M. McNamee (LU)
FPRF – Oxygen Reduction Systems – Phase 2, Co-I	2020-2021	\$213,000	Co-I with P. van Hees (LU) and M. Nilsson (Zurich Insurance, Sweden)
FPRF – Environmental Impact of Fire Research Roadmap, Co-I	2019	\$30,000	Co-I, with M. McNamee (LU) and Guy Marlair (Ineris)
FPRF – Oxygen Reduction Systems, Co-I	2018	\$25,000	Co-I with P. van Hees (LU) and M. Nilsson (Zurich Insurance, Sweden)
Brandforsk (Sweden) Holistic design of façade systems (HOLIFAS)	2018	\$100,000	Co-I in multi-researcher effort led by P. van Hees (LU)
NIST - Data Collection with UAV Swarms, with UCSD, WPI, PI**	2017	\$200,000	**Transferred to N. Dembsey when left WPI. Supports PhD student Wang.
TUS Structural Fire Engineering Joint Research Grant, PI	2017	\$20,000	Supports post-doc Kamath for structural fire testing at TUS in Japan
FPRF Award – Marina Risk Reduction, PI	2017	\$30,000	Supports PhD student Woojung Park for six-month stipend and tuition
TUS Structural Fire Engineering Joint Research Grant, PI	2016	\$17,000	Supports post-doc Kamath for structural fire testing at TUS in Japan
NASFM – Project FAIL-SAFE, Co-I	2016	\$102,000	Support PhD student Wang for one year
FPRF Award – Environmental Impacts of Fire, PI	2014-2015	\$25,000	Supports in part Drew Martin and Mai Tomida
DHS Award EMW-2012-FP-01336 - Green Building Fire Performance, PI	2013-2016	\$998,446	Supports PhD candidate Young-Geun You and MS students (Martin, Yin)
SFPE E&SF Award Post-Earthquake Fire Performance, PI	2012-2013	\$15,000	Supported MS candidate Jin Kyung Kim
FPRF Award - Safety Challenges of Green Buildings, PI	2012	\$15,000	Supported summer RA Brandon Poole
USDOE Award - Solar Decathlon China Competition, Co-I	2012	\$100,000	Supported various student projects
NIST Award 60NANB10D228 – Fire Risk and Design Fires, PI	2010-2013	\$341,602	Supports PhD candidate Alberto Alvarez and PI
KICT Contract – Advanced Research into PBFS Design Methods, PI	2010	\$87,727	Supported PhD candidate Haejun Park and PIs
NSF Award 0936505 – Earthquake Performance of Nonstruct. Sys., Co-I	2009	\$0*	Unfunded co-I (see Gifts for funding discussion)
DHS Award 2009-ST-108-000013 – Fire Hazards of Rail Vehicles, PI	2009	\$199,903	Supported ISG student Kurt Schebel and PIs
NSF Award 0840601 – Fire and Collapse at TUD, PI	2008	\$11,377	Supported PI travel
NSF Award 0322760 – Global Policy Summit - PB Building Regs	2003	\$40,000	Supported international workshop to identify future of PB building codes
NIST Grant 60NANB2D0138 – Uncertainty in Egress Models, PI	2002 - 2005	\$323,000	Research to improve the predictive capabilities of egress models
NSF Award 9730783 – Use of Risk in Performance Building Codes, Co-I	1998 - 2000	\$266,000	Supported Meacham PhD. (PI Roger Kaspersen)

National Fire Protection Association, PI	1997 - 1999	\$150,000	Supported development of the <i>SFPE Eng. Guide to PB Fire Protection</i>
NIST Grant 60NANB5D0138 – Performance Based Fire Design, PI	1995-1998	\$225,560	Conceptual basis for performance-based fire protection engineering for the US
Total		\$3,560,615	

* *NEESR: Full-Scale Structural and Nonstructural Building System Performance during Earthquakes*, \$1,200,000, NSF Award 0936505 (to UCSD), with \$0 funding from NSF to WPI, 10/09–11/12. Overall funding valued at over \$5,000,000 with payload and industry support (cash and in-kind). PI Hutchinson (UCSD), co-Is Restrepo (UCSD), Conte (UCSD), Walsh (SDSU), Marin (Howard) and Meacham. Fire research led by Meacham. See project website for details (<http://bncs.ucsd.edu/index.html>).

Research Gifts Facilitated – Summary

Gift/Donation	Value	Notes
IBHS	\$12,500	Cash donation to project on post-earthquake fire performance of CFS framed buildings (2016). Supports post-doc and equipment.
State Farm	\$25,000	Cash donation to project on post-earthquake fire performance of CFS framed buildings (2016). Supports post-doc and equipment.
CSSC	\$50,000	Cash donation to project on post-earthquake fire performance of CFS framed buildings (2016). Supports on-site needs (funds to stay in CA).
SFPE E&SF	10,000	Fellowship to Praveen Kamath to support project on post-earthquake fire performance of CFS framed buildings (2016).
FPRF	\$5,000	Gift / fellowship to Mai Tomida to support student research on environmental impacts of fire (2015).
SFPE E&SF	\$5,000	Gift / fellowship to Young-Geun You to help complete Building Fire Performance Analysis book by R.W. Fitzgerald and B.J. Meacham (2015)
FSNA	\$5,000	Gift to support Mary Long in evacuation modeling project (2015).
CSSC	\$50,000	Cash donation to support earthquake and fire project (2012). Supported equipment purchases for use on site at UCSD (funds had to stay in CA).
Arup	\$15,000	Cash donation to support earthquake and fire project (2011). Supported students Haejun Park and Jin Kyung Kim, as well as equipment and travel.
Hilti	\$15,000	Cash donation to support earthquake and fire project (2011). Supported students Haejun Park and Jin Kyung Kim, as well as equipment and travel.
SFPE E&SF	\$10,000	Cash donation to support earthquake and fire project (2011). Supported students Haejun Park and Jin Kyung Kim, as well as equipment and travel.
Tyco	\$5,000	Cash donation via FPE department to support ISG of Robert Accosta (2008)
Total	\$207,500	

Other Research Funding (Service to Industry, Collaborations, etc.) – Summary

Source	Value	Comments
Parsons Brinckerhoff	\$90,000+	Service to industry for small (Cone calorimeter) and real-scale (compartment-scale) testing of lining materials of rail vehicles
University of Navarra	\$5,000	Funded travel and accommodation for collaboration on University of Navarra project on performance-based assessment protocol for energy performance of retrofit measures for social housing in Spain
CUREE	\$10,000	Grant to support workshop aimed at generating government and industry support for a large-scale research effort on post-earthquake fire.

PRESENTATIONS AT CONFERENCES, SEMINARS, WORKSHOPS & COLLOQUIA (302)**Conference, Symposia and Colloquia Presentations (212)**

1. "PBD for Fire – Past, Present and Future," Invited Plenary, to be presented at the *2020 International Conference on Performance-Based Codes and Fire Safety Design Methods*, Auckland, New Zealand, 12 March 2020.
2. "International Perspective on Technical Competencies and Qualifications for Fire Safety Engineering (FSE)," *SFPE France Symposium on the Impact of the ESSOC Law on Fire Safety Engineering*, Paris, France, 7 November 2019.
3. "Design Fires for Fire Safety Engineering," *SFPE Switzerland Colloquium on Fire Safety Engineering*, ETH Zurich, Zurich, Switzerland, 5 November 2019.
4. "Fire Safety Engineering: Overview of International Approaches," *10th Congreso Internacional de Ingeniería de Seguridad contra Incendios: Diseño Basado en Prestaciones*, Madrid, Spain, 25-27 September 2019.
5. "An Holistic Framework for Developing and Assessing Risk-Informed Performance-Based Building Regulation," *Interflam 2019*, Royal Holloway College, Windsor, England, 1 July 2019.
6. "The State of Fire Safety Engineering in Seven Countries: Survey Outcomes and Preliminary Analysis," *2019 International Fire Safety Symposium (IFireSS)*, Ottawa, Canada, June 2019 (with Astrom, J., Axelsson, E., Lindahl, S., presented by Meacham).
7. "Review of Oxygen Reduction Systems in Warehouse Storage Applications," *2019 International Fire Safety Symposium (IFireSS)*, Ottawa, Canada, June 2019 (with Nilsson, M, van Hees, P. and Barton, J., presented by Meacham).
8. "SFPE Core Competencies for the Fire Protection Engineering Profession," *2019 International Fire Safety Symposium (IFireSS)*, Ottawa, Canada, June 2019 (with Militello, A. and Jonsson, J., to be presented by Militello).
9. "Emergency planning based on the fire scenarios," *2019 International Fire Safety Symposium (IFireSS)*, Ottawa, Canada, June 2019 (with Leiras, A. and Rodrigues, J.P., presented by Leiras).
10. "Review of Oxygen Reduction Systems in Warehouse Storage Applications," *2019 NFPA Annual Convention and Expo*, June 2019 (with Nilsson, M, van Hees, P. and Barton, J., presented by Nilsson and Meacham).
11. "What is Needed to increase the Use and Acceptance of Fire Safety Engineering: Analysis of Survey Data from Seven Countries," *2019 SFPE Europe Conference*, Malaga, Spain, 22-23 May 2019 (with Astrom, J., Axelsson, E. and Lindahl, S., presented by co-authors).
12. "Globally Significant Fire Research Needs and Funding Strategies: IAFSS Agenda 2030 for a Fire Safe World," *2019 SFPE Europe Conference*, Malaga, Spain, 22-23 May 2019 (with McNamee, M. and van Hees, P., to be presented by van Hees).
13. "Building Fire Resiliency – Challenges and Opportunities," *2019 NFCA Annual Conference*, National Fireproofing Contractors Association, Orlando, FL, 22 March 2019.
14. "Earthquake and post-earthquake fire performance of a mid-rise cold-formed steel framed building: characterizing component-level physical damage," *11th National Conference on Earthquake Engineering – Integrating Science, Engineering & Policy*, Los Angeles, CA, 26-29 June 2018 (with Hutchinson, T.C., Wang, X., Hegemier, G., Kamath, P., presented by Hutchinson).
15. "Emerging Threats in Port Facilities," *3rd International Conference on Safety in Ports (SIP)*, A Coruna, Spain, 7-8 May 2018.

16. "Situation with Performance-Based Codes and Fire Safety Design in Seven Countries," Invited Keynote Presentation, *SFPE 12th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Honolulu, HI, April 2018.
17. "Space Familiarity and Exit Familiarity for Emergency Egress," *SFPE 12th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Honolulu, HI, April 2018 (with Park, H.J., Haejun Park, Bang, C., Agnew, R., and Charter, V, presented by Park).
18. "A Quantified Risk-Based Framework for Life Safety," *SFPE 12th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Honolulu, HI, April 2018 (with I.J. van Straalen, presented by van Straalen).
19. "Roadmap for Incorporation of Risk Criteria and Analysis in Building Regulatory Decisions," *SFPE 12th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Honolulu, HI, April 2018 (with I.J. van Straalen, poster presentation).
20. "Emerging Issues in FSE: Research Roadmap and the Path Forward," Invited Keynote Presentation, *2nd SFPE Europe Conference on Fire Safety Engineering*, Rotterdam, Netherlands, February 2018.
21. "International Situation with Performance-Based Regulation for Fire and Fire Safety Engineering," *6th Asia FORUM for Advanced Fire Education / Research in Asia*, Tokyo University of Science / Agnes Hotel, Tokyo, Japan, 23 November 2017.
22. "Framework for Facilitating Next Generation Performance-Based Building Regulations" *Fire Safety Asia Conference 2017*, Singapore, 15-17 Nov. 2017.
23. "Fire Safety Design of Very Tall Buildings," *5th Annual Workshop of the Group on Protection of Buildings from Fire*, University of Sao Paulo, Brazil, 31 October 2017.
24. "International Trends in Building Fire Regulation," *5th Annual Workshop of the Group on Protection of Buildings from Fire*, University of Sao Paulo, Brazil, 31 Oct. 2017.
25. "Fire Safety Engineering Resilience" *9th Congreso Internacional de Ingeniería de Seguridad contra Incendios: Diseño Basado en Prestaciones*, Madrid, Spain, 23-25 October 2017.
26. "Fire Performance of a Full-Scale Loaded Cold-Formed Steel Framed Assembly in a Large Scale Furnace Test," *Fire Safety 2017, International Conference, Research and Advanced Technology in Fire*, Santander, Spain, 20 Oct. 2017 (with Kamath, P. & Matsuyama, K., presented by Meacham).
27. "Earthquake and post-earthquake fire performance of a mid-rise cold-formed steel framed building," *SEAOC 2017 Convention*, San Diego, CA, 13-15 September 2017 (with Hutchinson, T.C., Wang, X., Hegemier, G., and Kamath, P., to be presented by Hutchinson).
28. "Experimental Assessment of Steel Sheathed Shear Walls Subjected to Seismic Load and Fire," *12th International Symposium on Fire Safety Science*, Lund, Sweden, June 2017 (with Hoehler, M., Smith, C., Hutchinson, T., Wang, X., Meacham, B. and Kamath, P., presented by Hoehler)
29. "Full-Scale Fire Tests on a Cold-Formed Steel Frame in Fire Following Earthquake," *IFireSS – International Fire Safety Symposium*, Naples, Italy, 7-9 June 2017 (with Kamath, P., Meacham, B.J., Hutchinson, T. and Wang, X., to be presented by Kamath)
30. "Marina Risk Reduction," *2017 NFPA Annual Meeting and Conference*, Boston, MA, USA, 4-6 June 2017 (with W. Park and C. Grant).
31. "Performance-Based Codes and Design – An International Perspective," *2017 NFPA Annual Meeting and Conference*, Boston, MA, USA, 4-6 June 2017.
32. "Fire Performance of Green Building Features: Experimental Outcomes," *2017 NFPA Annual Meeting and Conference*, Boston, MA, USA, 4 June 2017 (M. Gollner, P. Kamath, N. Dembsey).

33. "Post-Earthquake Fire Performance of a Cold-Formed Steel Frame Building," *2017 NFPA Annual Meeting and Conference*, Boston, MA, 4-6 June 2017 (with P. Kamath).
34. "Post-Earthquake Fire Performance of Buildings: Outcomes from Full-Scale Experiments," *GRIPS International Symposium on Preparing for Earthquakes and Cascading Hazards*, National Graduate Institute for Policy Studies, Tokyo, Japan, 11 November 2016.
35. "Performance-Based Building Regulations: Historical Perspective and Future Trends," *Instituto de Ciencias de la Construcción Eduardo Torroja Session on the 10th Anniversary of the Technical Building Code of Spain (CTE), CONSTRUTEC Congress*, Madrid, 27 October 2016.
36. "Risk-Informed Performance-Based Design: Concepts and Applications to High-Challenge Facilities," *2nd International Congress of Industrial Safety in Ports*, A Coruña, Spain, October 2016
37. "Fire Safety Challenges with Sustainable Buildings, Materials & Systems," *Sustainable Fire Engineering 2016 Dublin*, Dublin, Ireland, 30 September 2016.
38. "Toward Next Generation Performance-Based Building Regulatory Systems," *SFPE 11th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Poland, 23-25 May 2016.
39. "Towards a Risk-Informed Performance-Based Approach for Post-Earthquake Fire Protection Design of Buildings," Invited Speaker, *10th Asia-Oceania Symposium on Fire Science and Technology*, Tsukuba, Japan, 5-7 October 2015.
40. "The Effects of Cultural Differences between Teachers and Pupils in the USA and Saudi Arabia on Emergency Evacuation – Analysis of Fire Alarm Recognition and Training," *6th International Symposium on Human Behavior in Fire*, Interscience Communications Ltd., London, September 2015 (with Almejmaj, M. and Skorinko, J., presented by Almejmaj).
41. "Impact of Smoke Compartment Size on Horizontal Evacuation Time in Healthcare Facilities," *6th International Symposium on Human Behavior in Fire*, Interscience Communications Ltd., London, September 2015 (with Martin, D. and Long, M.A., presented by Long and Martin).
42. "Experimental Observations of People Movement on Stairs," *6th International Symposium on Human Behavior in Fire*, Interscience Communications Ltd., London, Sep. 2015 (with Levy, C., Pierce, J., Porter, A., Da Vitorio, A., presented by Levy, Pierce and Da Vitorio).
43. "Standardizing "Agent" Characteristics in Pedestrian Agent Based Modeling," *6th International Symposium on Human Behavior in Fire*, Interscience Communications Ltd., London, September 2015 (with Almejmaj, M., Dembsey, N.A., Radzicki, M. and Skorinko, J., presented by Almejmaj).
44. "Time and Information as Central Factors in Modeling Human Behavior in Emergencies," *6th International Symposium on Human Behavior in Fire*, Cambridge, England, September 2015 (panel discussion with Pauls, J., Groner, N. and Gwynne, S.).
45. "Human Behavior in Fire: Informing Practice," *6th International Symposium on Human Behavior in Fire*, Cambridge, England, September 2015 (with Gwynne, S., Fahy, R., Thomas, I., Tavares, R.).
46. "Performance-Based Design - What's in it for me?" *2015 ABCB Building Australia's Future Conference*, Surfers Paradise, QSL, Australia, 14-16 September 2015.
47. "Quantification of Green Building Features on Firefighter Safety: Year 2 Report," DHS Award EMW-2012-FP-01336, *DHS 2015 Grantee Meeting*, August 2015, Washington, DC (with Dembsey, N.A., Martin, D., Yin, M., Figeroua, M., Kim, Y., Gollner, M., Marshall, A., Maisto, P.).
48. "Environmental Impacts of Fire," *2015 NFPA Annual Conference*, Chicago, IL, 22-25 June 2015 (with Martin, D. and Tomida, M., presented by Martin and Tomida).

49. "Impact of Green Building Features on Firefighter Safety," *2015 NFPA Annual Conference*, Chicago, IL, 22-25 June 2015 (with Martin, D., Gollner, M., presented by Martin & Gollner).
50. "Fire Performance of Select 'Green' Building Features and Technologies," *1st SFPE Europe Conference: Fire Safety Engineering*, Copenhagen, Denmark, 3-5 June 2015 (with Martin, D., presented by Martin).
51. "Assessing the Environmental Impact of Building and Wildland Fires," *1st SFPE Europe Conference: Fire Safety Engineering*, Copenhagen, Denmark, 3-5 June 2015 (with Martin, D., presented by Martin).
52. "Assessing Variability in Engineer Selection of Tenability Criteria," *1st SFPE Europe Conference: Fire Safety Engineering*, Copenhagen, June 2015 (Levy, C. and Martin, D., presented by Levy).
53. "Impact of Smoke Compartment Size on Horizontal Evacuation Time in Healthcare Facilities," poster presented at the *1st SFPE Europe Conference: Fire Safety Engineering*, Copenhagen, Denmark, June 2015 (with Martin, D. and Long, M., presented by Martin and Long).
54. "Fire Performance of Select 'Green' Building Features and Technologies," *IFireSS 2015*, University of Coimbra, Portugal, April 2015 (with Martin, D., Dembsey, N., presented by Martin).
55. "A Framework for Systematic Development of Fire Scenarios and Quantified Design Basis Fires," *IFireSS 2015*, University of Coimbra, Portugal, 20-23 April 2015 (with Jutras, I. and Tubbs, B., presented by Meacham).
56. "Engineering a Fire Safe and Sustainable Future" 8th Congreso Internacional de Ingeniería de Seguridad contra Incendios: Diseño Basado en Prestaciones, Madrid, Spain, 11 February 2015.
57. "Protecting Cultural Resources from Fire: A Performance-Based Approach" 1st Congreso Internacional de Ingeniería de Seguridad contra Incendios: Seguridad contra Incendios en el Patrimonio y en Bienes de Interés Cultural, Ourense, Spain, 8 February 2015.
58. "A Parametric Multi-Tool Study to Assess Smoke Management System Performance for an Atrium," *SFPE 10th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Surfers Paradise, Australia, 12-14 Nov 2014 (Alvarez-Rodriguez, A. and Almejmaj, M.).
59. "Development of Conceptual Building Fire Safety Performance Analysis Tool Incorporating Building Design Features," *SFPE 10th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Surfers Paradise, Australia, 12-14 November 2014 (with Park, H., Dembsey, N.A. and Goulthorpe, M., presented by Meacham).
60. "Proposed Design Fires and Scenarios for Regulation and Design," *SFPE 10th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Surfers Paradise, Australia, 12-14 November 2014 (Jutras, I., Tubbs, B. & Hurley, M., presented by Meacham).
61. "Quantification of Green Building Features on Firefighter Safety: Problem Definition, Data Collection, Preliminary Analysis and Experimental Plan," *SFPE 10th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Australia, Nov 2014 (with You, Y-G., Yin, M., Martin, D., Dembsey, N., Gollner, M., Marshall, A., Ahrens, M., Grant, C and Rodrigue, T., presented by Martin).
62. "The Effects of Culture-Specific Walking Speed Data on Egress Modeling in Shopping Malls- A Comparative Analysis," *SFPE 10th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Surfers Paradise, Australia, 12-14 November 2014 (with Almejmaj, M. and Skorinko, J., presented by Almejmaj).
63. "Risk-Informed and Performance-Based Life Safety Design for Atria Buildings," *SFPE 10th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Surfers Paradise, Australia, 12-14 Nov. 2014 (with Albrecht, C., presented by Meacham).

64. "Responding to Climate Change Impacts on the Built Environment: New Objectives for Performance-Based Building Regulation," Paper 213, *WSB14 - World Sustainable Building Conference*, Barcelona, Spain, 28-30 October 2014.
65. "Towards a Risk-Informed Decision Approach for Optimizing Retrofit of Existing Buildings for Energy Performance," *WSB14 - World Sustainable Building Conference*, Barcelona, Spain, 28-30 Oct. 2014 (with A. Sanchez, Echevarria, J., R. Pietroforte, R., presented by Echevarria).
66. "Post-Earthquake Fire Performance of Buildings," Invited Keynote Presentation, *2014 SFPE Technical Conference*, Long Beach, CA, 13-14 October 2014.
67. "Fire Safety Challenges of 'Green' Features and Systems in Buildings," *2014 ICC Annual Conference*, Educational Sessions, Ft. Lauderdale, FL, 29-30 September 2014.
68. "Risk-Informed Performance-Based Design: Concepts and Applications to High-Challenge Facilities," *SFPE Saudi Arabian Chapter Annual Conference*, Al-Khobar, Saudi Arabia, 15-18 September 2014.
69. "New SFPE Guidance on Fire Safety in Very Tall Buildings," *2nd International Tall Buildings Fire Safety Conference*, University of Greenwich, England, 17-19 June 2014
70. "Fire Alarms: Recognition and Perceived Urgency," *2014 NFPA Conference & Exposition*, Las Vegas, NV, 9-12 June 2014 (with M. Almejmaj, presented by Almejmaj).
71. "Addressing Green Building Features for Fire Fighter Safety," *2014 NFPA Conference & Exposition*, Las Vegas, NV, 9-12 June 2014.
72. "Overview of Building Regulatory System and Use of Performance-Based Design for Fire in the USA," CBMDF Seminar, Research and Innovation in Fire Prevention & Firefighting, Brasilia, Brazil, May 2014.
73. "Fire Performance of Full-Scale Building Subjected to Earthquake Ground Motion: Fire Test Program and Outcomes," *11th International Symposium on Fire Safety Science*, Christchurch, New Zealand, Feb. 2014 (with Park, H. and Kim, J.K., presented by Park).
74. "Fire Performance of Full-Scale Building Subjected to Earthquake Ground Motion: Test Specimen, Ground Motions and Seismic Performance of Fire Protection Systems," *11th International Symposium on Fire Safety Science*, Christchurch, NZ, Feb. 2014, (with Kim, J.K. and Park, H., presented by Park).
75. "Analysis and Prediction of Post-Earthquake Fire Performance of Buildings," *2013 SFPE Annual Professional Development Conference*, Austin, TX, Oct 2013 (with J.K. Kim, presented by Kim).
76. "Fire Safety Engineering: Current State and Possible Futures," *EUROFIRE 2013*, Basel, Switzerland, October 9-10, 2013.
77. "A New Paradigm and Framework for Risk-Informed Performance-Based Fire Safety Design - Concept and Implementation," *EUROFIRE 2013*, Basel, Switzerland, October 9-10, 2013 (with A. Alvarez, presented by Alvarez).
78. "The VULCAN INITIATIVE: a Web Platform for the Next Generation of Performance-Based Fire Protection Design," *Interflam 2013*, Interscience Communication, Ltd., London, June 2013 (with A. Alvarez and M. Ferreira, presented by Alvarez and Meacham).
79. "Fire Performance of Earthquake-Damaged Buildings: Overview and Preliminary Analysis of Full-Building Earthquake and Fire Tests," *Interflam 2013*, Interscience Communication, Ltd., London, June 2013 (with J-K Kim and H. Park, presented by Kim and Meacham).
80. "Fire Safety Challenges of Green Buildings," *Interflam 2013*, Interscience Communication, Ltd., London, June 2013 (poster presentation).

81. "Fire Performance in Earthquake Damaged Buildings: Overview of Test Program and Preliminary Findings," *NFPA Conference & Exposition*, Chicago, IL, 10-13 June 2013 (with J. Kim and H. Park, presented by Kim and Park).
82. "Fire Safety Challenges of Green Buildings," *NFPA Conference & Exposition*, Chicago, IL, June 2013.
83. "The VULCAN INITIATIVE: A Web Platform for the Next Generation of Performance-based Fire Protection Design," *NFPA Conference & Exposition*, Chicago, IL, 10-13 June 2013 (with A. Alvarez and M. Ferreira, presented by Alvarez).
84. "Fire Extinguishment Analysis for Unsprinklered Buildings," 2nd CILASCI Conference, University of Coimbra, Portugal, 1 June 2013 (with Fitzgerald, Till, Toomey, presented by Fitzgerald).
85. "Risk Management Based on Fire Performance Analysis," 2nd CILASCI Conference, University of Coimbra, Portugal, 1 June 2013 (with R.W. Fitzgerald, presented by Fitzgerald).
86. "Shake Table Testing of a Full-Scale Five-Story Building: Post-Earthquake Fire Performance," *2013 ASCE Structures Congress*, 2-4 May 2013, Pittsburg, PA (with J. Kim and H. Park).
87. "Shake Table Testing of a Full-Scale Five-Story Building: Seismic Performance of the Major Nonstructural Components: Egress Systems, Facades," *2013 ASCE Structures Congress*, 2-4 May 2013, (Pantoli, E., Chen, M., Wang, X., Hutchinson, T., Kim, J., presented by Pantoli).
88. "Observations from the Fire and Collapse of the Faculty of Architecture Building, Delft University of Technology," *2013 ASCE Structures Congress*, 2-4 May 2013, Pittsburg, PA (with Engelhardt, M.D., Kodur, V., Kirk, A., Park, H., van Straalen, I., Maljaars, J., van Weeren, K., de Feijter, R. and Both, K., presented by Engelhardt).
89. "Global Situation with Performance-Based Codes and Fire Safety Design," Invited Keynote Presentation, *7th Biennial Conference on Fire Protection Engineering: Performance-Based Design in Buildings, Industry and Transport*, Madrid, Spain, 20 February 2013.
90. "Snapshot of Global Situation with Performance-Based Codes and Fire Safety Design," Invited Keynote Address, *7th Biennial Conference on Fire Protection Engineering*, Madrid, Feb. 2013.
91. "Fire and Use: Risk Characterization in Sustainable Buildings," *Solar Building Skins –7th ENERGY FORUM*, Bressanone, Italy, 6-7 December 2012. Post presentation (with Echeverria, J., Gonzalaz, P. and Sanchez-Ostiz, A. presented by Echeverria).
92. "Fire Safety Challenges of Green Buildings," *Fire Protection Research Foundation Symposium: Fire Safety Design and Sustainable Buildings: Challenges and Opportunities*, 7-8 Nov. 2012, Chicago, IL.
93. "Performance-Based Fire Protection Engineering: Current Situation and Future Trends," *SFPE Annual Meeting and Technical Conference*, Savannah, GA, 15 October 2012.
94. "The Effects of Cultural and Social Differences between the West and Saudi Arabia on Emergency Evacuation," *5th International Symposium on Human Behavior in Fire*, Cambridge, England, September 2012 (with M. Almejmaj).
95. "'Test bed' Environment Process for Assessing the Appropriateness of Engineering Tools to be Used in Performance-Based Design Applications," *9th SFPE International Conference on Performance-Based Codes and Fire Safety Design Methods*, Hong Kong, SAR China, June 2012 (with A. Alvarez, presented by Alvarez).
96. "Increasing Fire Safety by Bridging the Gap between Architects and Fire Safety Engineers," *9th SFPE International Conference on Performance-Based Codes and Fire Safety Design Methods*, Hong Kong, SAR China, June 2012 (with H. Park and N. Dembsey, presented by Park).

97. "Development of a Performance-Based Approach to Addressing Fire Safety in Existing Buildings," *9th SFPE International Conference on Performance-Based Codes and Fire Safety Design Methods*, Hong Kong, SAR China, June 2012 (with J. Echeverria, presented by both).
98. "Observations from Student Exercises and Proposed Experimental Scenarios for Human Behavior Data Collection," *Pedestrian and Evacuation Dynamics 2012*, ETH, Zurich, Switzerland (poster presentation with M. Almejmaj, presented by Meacham).
99. "International Experience with Performance-Based Codes and Fire Safety Design," Invited Speaker, *National Fire Safety Conference of Poland*, Krakow, Poland, 23-24 March 2012.
100. "Limits of Existing Data for Evacuation Modeling," Invited Speaker, *8th Annual Fire Safety Conference*, Society of Fire Protection Engineers Atlanta Chapter, Duluth, GA, 14 March 2012.
101. "Assessing Fire Development Risk in Vehicles and the Impacts on Tunnel Infrastructure," *5th International Symposium on Tunnel Safety and Security*, New York, NY, 14-16 March 2012 (with Alston, J., Schebel, K., and Coles, A., presented by Alston).
102. "A New Approach to Determining Passenger Rail Vehicle Design Fires," *2012 ASHRAE Annual Meeting*, January 2012, (with Tubbs, J., Alston, J., Johann, M., Dembsey, N.A., Schebel, K., presented by Tubbs).
103. "Fire Growth Simulation in Passenger Rail Vehicles Using a Simplified Flame Spread Model Coupled with a CFD Fire Model," *SFPE 2011 Engineering Technology Conference*, Portland, OR, 25 October 2011 (with Schebel, K., Dembsey, N.A., Tubbs, J., Johann, M., Alston, J., presented by Schebel (*SFPE Foundation Student Scholar Award*)).
104. "Summary of the IRCC Workshop on International Perspectives on the Role of Building Regulation in Responding to the Challenges of Climate Change," *SB11 - World Sustainable Building Conference*, Helsinki, Finland, 19 October 2011 (presented by N. Tolstoy, Boverket).
105. "Delivering Better Fire Safety Performance – How New Zealand is Championing Change Worldwide," Invited Keynote Paper, *Fire NZ2011*, Auckland, New Zealand, 15 Sep. 2011.
106. "'Ready-to-Use' Building Layouts and Combustible Packages for 3-D Fire Simulations," *Fire and Evacuation Modeling Technical Conference*, Baltimore, MD, 16 August 2011 (with A. Alvarez, presented by Alvarez).
107. "The Effects of Sprinkler Sprays on the Transport of Toxic Products, Comparison of Experimental and Numerical Results," poster, *IAFSS 10*, University of Maryland, College Park, July 2011 (with Magnone, Z.L., Accosta Jr., R.F., Dembsey, N., presented by Magnone).
108. "A Simplified Approach for Assessing Initial Fire Development and Spread in Passenger Rail Vehicles," *National Fire Protection Association 2011 Annual Conference*, Boston, MA, June 2011 (with Dembsey, N.A., Tubbs, J., Johann, M. and Schebel, K., presented by Schebel).
109. "Fire Safety Engineering: Current State and Possible Futures," Invited Keynote Address, *International Conference on Fire Safety Engineering, FSE11, Raising the Bar*, Sydney, Australia, 23 March 2011.
110. "Performance-Based Fire Safety Engineering: Current Situation and Future Trends," Invited Keynote Address, *6th Biennial Conference on Fire Protection Engineering: Performance-Based Design in Buildings, Industry and Transport*, Madrid, Spain, 23 February 2011.
111. "Fire and Collapse, Faculty of Architecture Building, Delft University of Technology: Implications for Performance-Based Design," *6th Biennial Conference on Fire Protection Engineering*, Madrid, Feb 2011.

112. "A Simplified Approach for Assessing Initial Fire Development and Spread in Passenger Rail Vehicles," *Transportation Research Board 2011 Annual Meeting*, Washington, DC, 25 January 2011 (with Dembsey, N.A., Tubbs, J., Johann, M. and Schebel, K., presented by Meacham).
113. "Green Buildings and Fire Safety," Invited Keynote Address, *The International Forum on the Special Challenges of MegaCity and the Solutions for Fire Safety*, Seoul, 6 October 2010.
114. "Development and Assessment of a Decision Support Framework for Enhancing the Forensic Analysis and Interpretation of Fire Patterns, Plenary Address, *2010 International Symposium on Fire Investigation and Technology*, University of Maryland, College Park, MD, 27-29 September 2010 (with Gorbett, G.E. and Wood, C.B., presented by Gorbett).
115. "Towards an Integrated Performance-Based Design Approach for Life Safety across Different Building Use Groups," *Interflam 2010*, London, July 2010 (with Alvarez, A., by Alvarez).
116. "The Effects of Sprinkler Sprays on the Transport of Toxic Products: Comparison of Experimental and Computer Model Results," *Interflam 2010*, London, July 2010 (with Accosta, R., Xiao, B., Crocker, J., Magnone, Z, and Dembsey, N, presented by Accosta).
117. "Performance-Based Design and Regulation: Challenges Faced, Lessons Learned, and a Look to the Future," *Interflam 2010*, London, July 2010.
118. "Fire and Collapse, Faculty of Architecture Building, Delft University of Technology: Implications for Performance-Based Design," *8th International Conference on Performance-Based Codes and Fire Safety Design Methods*, SFPE, Bethesda, MD, June 2010 (with Park, H., Engelhardt, M., Kodur, V., van Straalen, I., Maljaars, J., van Weeren, K., de Feijter, R. and Both, K., presented by Meacham).
119. "The Effect of Sprinkler Sprays on the Transport of Toxic Products," *2009 SFPE Annual Meeting and Technology Conference*, Scottsdale, AZ, October 19-20, 2009 (with Accosta, R., Dembsey, N., Beaulieu, T. and Crocker, J., presented by Accosta).
120. "Facilitating Innovation without Compromising Performance: Challenges Faced, Lessons Learned, and a Look to the Future," *2009 Building Australia's Future Conference and Workshops*, Surfer's Paradise, Australia, 21-25 September 2009.
121. "Application of Adaptive Management to Building Evacuation and Emergency Response," *4th International Symposium on Human Behavior in Fire*, Cambridge, England, July 13-15, 2009.
122. "Assessment of Human Behavior Parameters Used in Performance-Based Fire Design Approaches for Different Building Use Groups", *4th International Symposium on Human Behavior in Fire*, Cambridge, England, July 2009 (poster presentation with Alvarez, A.,).
123. "Informing Responses through Improved Situational Awareness – How do We Deliver the "Right" Information?" panel discussion, *Informed Emergency Responses through Improved Situation Awareness*, presented at the *4th International Symposium on Human Behavior in Fire*, Cambridge, UK, July 2009.
124. "Selecting Appropriate Evacuation Strategies for Super Tall Buildings: Current Challenges and Needs" *4th International Symposium on Human Behavior in Fire*, Cambridge University, Cambridge, England, July 13-15, 2009 (Tubbs, J. and Meacham, B., presented by Tubbs).
125. "Collection of Data on Fire and Collapse, Faculty of Architecture Building, Delft University of Technology," poster presentation, *2009 CMMI Engineering Research and Innovation Conference*, National Science Foundation, Honolulu, HI, June 25-28 2009.
126. "SFPE Engineering Guides," *5th Biennial Conference on Fire Protection Engineering: Performance-Based Design in Buildings, Industry and Transport*, Madrid, Spain, 18 Feb 2009.

127. "Global Status of Performance-Based Codes and Fire Protection Design Concepts," Invited Conference Keynote Address, *5th Biennial Conference on Fire Protection Engineering: Performance-Based Design in Buildings, Industry and Transport*, Madrid, 18 Feb 2009.
128. "CRS Criteria for Testing the Applicability of Adaptive Management Concepts to Emergency Planning and Response: A Study Case for Fire," *Society for Risk Analysis, 2008 Annual Meeting, Symposium on Broadening Risk Considerations in Infrastructure Design*, Boston, MA, Dec 2008.
129. "A Risk-Informed Approach to Fire Safety Design of Tall Buildings," Invited Lecture, *International Seminar for Fire Safety Technology on High Rise Buildings*, Seoul, Korea, Nov 2008.
130. "Adaptive Management in Fire Regulation and Emergency Response," *2008 International Association for Fire Safety Science Symposium*, Karlsruhe, Germany, September, 2008.
131. "Using Risk as a Basis for Establishing Tolerable Performance: An Approach for Performance-Based Building Regulation," *7th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Wellington, NZ, April 2008.
132. "Quantification of Performance in Building Codes: Principles," presented at the *Australian Building Code Board 5th National Conference, Building Australia's Future 2007*, (Invited Speaker), Surfer's Paradise, Australia, September 25, 2007.
133. "Using Risk as a Basis for Establishing Tolerable Performance: An Approach for Building Regulation," presented at the *Workshop on Risk Acceptance and Risk Communication*, Stanford University, Stanford, CA, 26-27 March 2007.
134. "Current Worldwide Situation with Performance-Based Fire Protection Design," presented at the *4th Biennial Conference on Fire Protection Engineering: Performance-Based Design in Buildings, Industry and Transport*, (Invited Speaker), Madrid, Spain, 21 February 2007.
135. "Use of Refuge Floors in Very Tall Buildings: The Asian Experience," Joint CIB W14 & TG50 Symposium, *Tall Building and Fire*, Atlanta, GA, September 29, 2006.
136. "Fire as an Extreme Event," *ACI Annual Convention*, Kansas City, MO, November 6, 2005.
137. "Using Risk as a Basis for Establishing Tolerable Performance: An Approach for Building Regulation," presented at the *Australian Building Code Board 4th National Conference, Building Australia's Future 2005*, (Invited Speaker), Surfer's Paradise, Australia, 13 Sep. 2005.
138. "A Consultant's Perspective on the Role of Risk Analysis in Fire Engineering," *APEC TG3 Standards and Conformance Committee Seminar on Fire Performance of Timber Construction – Building Confidence in Timber*, (Invited Speaker), 24-26 May 2005, Wellington, NZ.
139. "Performance-Based Fire Protection Design: Evolution, Current Situation, and Thoughts for the Future," *3rd Biennial Conference on Fire Protection Engineering*, Madrid, Spain, 16 Feb 2005.
140. "Risk-Informed Performance-Based Design: A Process for Balancing Openness and Security Objectives in Buildings," *2004 NFPA Fall Education Forum – Preparedness and Protection in a Hazardous World*, (with Jeff Tubbs and Chris Marrion), Miami, FL, 15 November 2004.
141. "Use of TARA/TVA to Inform Risk Management Decisions," *BOMA Annual Codes & Regulations / Government Affairs Conference – New Codes for New York City*, New York, NY, Oct 21, 2004.
142. "Building Codes and Fire Safety Design in the post September 11, 2001 Environment: How Have Things Changed?" *5th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Luxembourg, 6-8 October 2004.
143. "Uncertainty in Egress Models and Data: Investigation of Dominant Parameters and Extent of Their Impact on Predicted Outcomes – Initial Findings," *5th International Conference on Performance-Based Codes and Fire Safety Design Methods*, Luxembourg, 6-8 October 2004.

144. "Investigation of Uncertainty in Egress Models," *3rd International Symposium on Human Behaviour in Fire*, Belfast, Northern Ireland, 1-3 September 2004.
145. "SFPE TG on Fire Risk: Current Status," *Fire Protection Research Foundation, Fire Risk and Hazard Assessment Research Application Symposium*, Annapolis, MD, 23-25 June 2004.
146. "Risk Assessment and Mitigation for Residential and Commercial Properties," *BuildingsNY*, (with Gayle Katzman, Arup Risk Consulting), New York, NY, 8-9 June 2004.
147. "Threat, Risk and Vulnerability Assessment over Building the New Fulton Street Transit Center in NYC," *Rail & Bus Transportation Security Summit*, (with Uday Durg, P.E., New York City Transit / MTA), Washington, DC, 23 August 2004.
148. "A Risk-Informed Performance-Based Approach to Tall Building Design," *CIB-CTBUH International Conference on Tall Buildings: Strategies for Performance in the Aftermath of the World Trade Center*, Kuala Lumpur, Malaysia, 22 October 2003.
149. "Performance System Model – A Framework for Describing the Totality of Building Performance," *CIB-CTBUH International Conference on Tall Buildings: Strategies for Performance in the Aftermath of the World Trade Center*, CIB and CTBUH, 23 October 2003.
150. "Qualitative Versus Quantitative Aspects of Performance-Based Regulation" *CIB-CTBUH International Conference on Tall Buildings: Strategies for Performance in the Aftermath of the World Trade Center*, CIB and CTBUH, October 2003.
151. "Risk-Informed Performance-Based Design for the 21st Century," *2003 AIA Annual Meeting*, San Diego, CA, USA, 8 May 2003.
152. "A Risk-Informed Performance-Based Decision Framework for Security, Blast, Technological and Natural Hazard Mitigation," *Society for Risk Analysis Annual Meeting*, New Orleans, LA, 9-10 December 2002 (with Richard Little, National Research Council).
153. "The Role of Risk in Building Regulation and Design for Extreme Events," *Society for Risk Analysis Annual Meeting*, New Orleans, LA, 9-10 December 2002.
154. "Challenges in Decision-Making for Fire Risk Problems," *SFPE Symposium on Issues in Fire Risk Assessment*, New Orleans, LA, 5-6 December 2002.
155. "Understanding Risk: Quantification, Perception and Characterization," *SFPE Symposium on Issues in Fire Risk Assessment*, New Orleans, LA, 5-6 December 2002.
156. "Extreme Events, Risk and Performance-Based Design," *Build Boston*, Boston Society of Architects, Boston, MA, November 13, 2002.
157. "Performance-Based Design for Fire Safety," *The MCEER Workshop, Lessons from the World Trade Center Terrorist Attack: Management of Complex Civil Emergencies and Terrorism-Resistant Civil Engineering Design*, New York, 24-25 June 2002.
158. "Risk Perception," *CIB Global Leaders Summit on Tall Buildings*, Garston, UK, 25 April 2002.
159. "Risk and Data Needs for Performance-based Codes," *National Research Council Workshop to Identify Innovative Research Needs to Foster Improved Fire Safety in the United States*, National Research Council, Washington, DC, 15-16 April 2002.
160. "High Rise Steel Frame Buildings in Fire – Is performance Based Design the Way Forward?" *ASCE Structures Conference*, Denver, CO, 4-6 April 2002.
161. "A Performance-Based Multi-Objective Decision Framework for Security and Natural Hazard Mitigation," (with R. Little and R. Smilowitz), *National Symposium on Comprehensive Force Protection*, Society of American Military Engineers, Charleston, SC, Nov 1-2, 2001.

162. "Characterizing Design Loads for Performance-Based Fire Safety Design," *International Conference on Engineered Fire Safety Design*, San Francisco, CA, 11-15 June 2001.
163. "Application of Risk Concepts in Performance-Based Fire Protection Engineering," *International Conference on Engineered Fire Safety Design*, San Francisco, 11-15 June 2001.
164. "Identifying and Regulating for Multiple Levels of Performance," *International Council for Building Research and Innovation, World Congress*, Wellington, NZ, 2-7 April 2001.
165. "Understanding Risk Assessment and its Use in Performance-Based Codes and Fire Safety Design," Australian Building Codes Board Conference, *Building Tomorrow's Future – International and National Partners*, Surfers Paradise, Queensland, Australia, 9-11 April 2001.
166. "Factors Affecting the Perception of Risk and their Impact on Human Behavior in Fire," *Second International Symposium on Human Behavior in Fire*, Massachusetts Institute of Technology, Cambridge, MA, 26-28 March 2001.
167. "Characterizing Risk for Performance-Based Building Regulations," *International Conference on Safety and Risk in Engineering*, IABSE, Malta, 24 March 2001.
168. "A Framework for Incorporating Risk Concepts into Performance-Based Building and Fire Regulations," *Annual Meeting of the Society of Risk Analysis*, Arlington, VA, 3-6 Dec. 2000.
169. "Use of a Decision-Support Tool for Addressing Risk Concepts in Performance-Based Building Fire Safety Regulation Development," *PSAM5, Fifth International Conference on Probabilistic Safety Assessment and Management*, Osaka, Japan, November 2000.
170. "Risk-Based and Risk-Informed Systems Approaches to Fire Safety Engineering: Historical Review and Current Trends," *PSAM5, Fifth International Conference on Probabilistic Safety Assessment and Management*, Osaka, Japan, November, 2000.
171. "Addressing Uncertainty in Performance-Based Fire Safety Engineering: An International Perspective," *UNIFIRE 2000, Annual Conference of the Fire Code Reform Centre, Ltd.*, Melbourne, Victoria, Australia, 10-11 August 2000.
172. "Application of a Decision-Support Tool for Comparing and Ranking Risk Factors for Incorporation into Performance-Based Building Regulations," *3rd International Conference on Performance-Based Codes and Fire Safety Design Methods*, 15-17 June 2000, Lund, Sweden.
173. "The Role of Risk in Development of Performance-Based Regulations," *International Workshop: An Introduction to Performance Based Design for Fire Safety*, 17-18 Feb 2000, Vancouver, BC.
174. "Incorporating Risk Concepts into Performance-Based Building and Fire Regulation Development," *American Society of Mechanical Engineers, International Mechanical Engineering Congress, Safety Engineering and Risk Analysis Division*, 14-19 Nov. 1999, Nashville, TN, USA.
175. "Assessment of the Technological Requirements for Realization of Performance-Based Fire Safety Design in the United States: Final Report," *3rd International Conference on Fire Research and Engineering*, SFPE, Chicago, IL, USA, 4-9 October 1999.
176. "Engineered Fire Safety Design Alternatives," *1999 Joint Conference of Building Officials and Code Administrators International, International Conference of Building Officials, and Southern Building Code Congress International*, St. Louis, MO, 14 September 1999.
177. "International Experience in the Development and Use of Performance-Based Fire Safety Design Methods: Evolution, Current Situation, and Thoughts for the Future," *Invited Speaker, IAFSS 6th International Symposium on Fire Safety Science*, Poitiers, France, 5-9 July 1999.
178. "Risk-Related Policy Issues in Performance-Based Building and Fire Code Development," *Interflam: 8th International Conference on Fire Science and Engineering*, Edinburgh, 1 July 1999.

179. "Incorporating Risk Concepts into Performance-Based Building and Fire Regulations Development," *2nd Conference on Firesafety Design in the 21st Century*, Worcester, MA, Jun 1999.
180. "Encouraging the Use of Risk Concepts in Performance-Based Building and Fire Regulation Development," *SFPE Symposium on Risk, Uncertainty, and Reliability in Fire Protection Engineering, and the SFPE/Clark University/NSF Workshop Encouraging the Use of Risk Concepts in Performance-Based Building and Fire Regulation Development*, May 1999.
181. "Fire Safety Analysis and Design in a Performance-Based Regulatory System," *International Convention on Global Building Model in the Next Millennium*, Victoria Building Control Commission, Melbourne, Australia, April 1999.
182. "Incorporating Risk Concepts into Performance-Based Building and Fire Regulations Development: Phase I – Conceptual Approach," *Society for Risk Analysis Annual Meeting*, Phoenix, AZ, Dec. 1998.
183. "The Role of Engineering Societies in Global Fire Safety Engineering Practice," *Symposium on International Harmonization of Performance-Based Fire Safety*, National Institute of Standards and Technology, Gaithersburg, MD, USA, 5-6 October 1998.
184. "A Performance-Based Building Regulatory System: Providing a Means to Streamline the Building Regulatory Process, Promote Innovation in the Construction Industry, and Improve International Economic Competitiveness," *The NCSBCS/NIST/HUD Joint Technical and Research Conference* NCSBCS, Dana Point, CA, 4-7 November 1998. (Best Paper Award)
185. "Integrating Human Factors Issues Into Engineered Fire Safety Design," *Keynote Speaker, 1st International Symposium on Human Behaviour in Fire*, University of Ulster, Antrim, Northern Ireland, 31 August - 2 September 1998.
186. "Risk-Informed Decision-Making in Performance-Based Building and Fire Code Development," *NFPRF Fire Risk and Hazard Assessment Research Application Symposium*, San Francisco, CA, USA, 24-26 June 1998.
187. "Introduction to Performance-Based Codes and Fire Safety Design," *Invited Speaker, Nuclear Energy Institute, Fire Protection Information Forum*, Santa Fe, NM, USA, 24 March 1998.
188. "Engineered Fire Protection Alternatives and Introduction to Computer Modeling for Building Officials," *International Conference of Building Officials, Colorado Chapter, Educational Institute*, Denver, CO, USA, 6 March 1998.
189. "Performance-Based Codes and Fire Safety Design Methods: Application of Fire Research and Codification of Performance," *Invited Speaker, Australian Building Codes Committee*, Surfers Paradise, Queensland, Australia, 4 February 1998.
190. "Performance-Based Codes and Fire Safety Design Methods: Current Situation and Future Needs," *Invited Speaker, AIA Center for Building Performance & Regulations Conference on Performance Codes: How Will They Happen*, San Francisco, CA, USA, 17 October 1997.
191. "Engineered Fire Protection Alternatives and Introduction to Computer Modeling for Building Officials," *International Conference of Building Officials, 1997 Annual Meeting*, Phoenix, AZ, 25 September 1997.
192. "Assessment of the Technological Requirements for Realization of Performance-Based Fire Safety Design in the United States: Phase I - Fundamental Requirements," *2nd International Conference on Fire Research and Engineering, NIST*, Gaithersburg, MD, 12 August 1997.
193. "Identifying and Addressing Uncertainty in Fire Protection Engineering," *2nd International Conference on Fire Research and Engineering, NIST*, Gaithersburg, MD, 12 August 1997.

194. "Concepts of a Performance-Based Regulatory System for the United States," *Invited Speaker, AIA Center for Building Performance & Regulations*, Washington, DC, USA, 19 April 1997.
195. "An Introduction to Performance-Based Fire Safety Design with Applications to Structural Fire Safety Analysis and Design," *ASCE Structures Conference*, Portland, OR, USA, 15 April 1997.
196. "Concepts of a Performance-Based Regulatory System for the United States," *International Association for Fire Safety Science, 5th Symposium*, Melbourne, Australia, 5 March 1997.
197. "Uncertainty in Fire Safety Engineering," *VUT CESARE and SFPE Workshop on Performance-Based Fire Safety Design*, Victoria University of Technology, Melbourne, AUS, 28 Feb. 1997.
198. "An Introduction to Performance-Based Fire Safety Design," *Fire Protection Research Foundation Fire Risk and Hazard Assessment Symposium*, San Francisco, CA, June 1996.
199. "Performance-Based Fire Safety Codes and Engineering Methods: Projects and Perspectives of the SFPE," *NFPA Annual Meeting*, Boston, MA, USA, 20 May 1996.
200. "Performance-Based Fire Safety Codes and Engineering Methods: Projects and Perspectives of the SFPE," *Interflam '96, Cambridge University*, Cambridge, U.K., 26-28 March 1996.
201. "SFPE Perspectives on Performance-Based Fire Safety Design," *U.S./Japan Government Cooperative Program on Natural Resources (UJNR), Fire Research and Safety, 13th Joint Panel Meeting*, March 13-20, 1996, Gaithersburg, MD.
202. "Performance-Based Codes and Design Methods: An Overview," *Build Boston*, World Trade Center, Boston, MA, USA, 16 November 1995.
203. "Application of Fire Dynamics to Fire Detection System Design," *SFPE Technical Symposium on Applications of Fire Dynamics*, University of British Columbia, Canada, 10-11 July 1995.
204. "The Development and Use of Performance-Based Fire Safety Engineering Criteria in International Codes and Standards," *Joint Meeting of the NFPA's Lodging Industry and Industrial Sections*, NFPA Fall Meeting, Toronto, Ontario, Canada, 15 November 1994.
205. "Benefits of Emergency Voice Communication in Hotels," *The Confederation of Fire Protection Associations (Europe) Symposium on Hotel Fire Safety*, Conference Centre of The European Commission, Luxembourg, 1-2 March 1994.
206. "Challenges in Computer Simulation of Low Energy Fires for Smoke Detector Activation Modeling," *EUSAS Workshop on Simulation Techniques as a Background for and Aimed to Fire Detection*, University of Duisburg, Germany, 13-14 January 1994.
207. "Fire Protection in Cable and Service Tunnels: A Goal Oriented Approach," *International Conference on Safety in Cable and Service Tunnels*, London, England, 15-16 November 1993.
208. "Fire Safety in Nuclear Facilities: A Performance-Based Approach," *Post SMiRT Conference No. 6, Fire Safety in Nuclear Facilities*, Heidelberg, Germany, 22-23 August 1993.
209. "International Issues and Developments in Fire Detection and Signaling Systems," *SFPE Engineering Seminars on Issues in International Fire Protection Engineering Practice*, Orlando, FL, USA, May 1993.
210. "Factors Affecting the Early Detection of Fire in Electronic Equipment and Cable Installations," *International Telecommunications Fire Protection Symposium*, New Orleans, LA, USA, May 1992.
211. "Application of State of the Art Detection and Alarm Technology: New Promises, New Problems," *SFPE Engineering Seminar on Engineering Methods in Building Firesafety Design*, Montréal, Québec, Canada, November 1991.

212. "Characterization of Smoke from Burning Materials for the Evaluation of Light Scattering Type Smoke Detector Response," *SFPE Engineering Seminar on Advancing Fire Detection and Alarm Technology*, San Antonio, TX, USA, May 1990.

Workshop, University, Grant and Professional Presentations and Lectures (90)

1. "SFPE 'State of the Society' Update: Current Activities and Strategies for the Future," SFPE British Columbia Chapter, December 2019.
2. "Urban Fire Risk Assessment and Mitigation Evaluation (Urban FRAME) Tool – Concepts," World Bank, Washington DC, September 2019.
3. "SFPE 'State of the Society' Update: Current Activities and Strategies for the Future," SFPE Japan Chapter, May 2019.
4. "Emerging Societal Issues and Associated FPE Research, Innovation, Technology & Education Needs," SFPE Northern California and Nevada Chapter, April 2019.
5. "SFPE 'State of the Society' Update: Current Activities and Strategies for the Future," SFPE Southern Nevada Chapter, March 2019.
6. "Introduction to Performance-Based Design for Fire," UNC Charlotte, February 2019.
7. "Need for a Mission in Fire Safety – Fire Safety Engineering Perspective," Workshop to Define a Fire Safety Mission for Europe, IAFSS, Brussels, Belgium, 3 December 2018.
8. "Potentially Conflicting Objectives of Fire Safety and Sustainability," *IRCC – OIB Workshop on Sustainability in the Construction Sector*, Vienna, Austria, 23 May 2018.
9. "Incorporating Risk Concepts into Performance-Based Design," Lecture, *International Masters in Fire Safety Engineering (IMFSE) Program*, Lund University, 16 May 2018.
10. "Factors Affecting the Acceptability or Tolerability of Risk," Lecture, *Fire Safety Engineering Program*, Lund University, 14 May 2018.
11. "Sustainable Design and Resilient Design – Competing Objectives or Design Opportunity?," Lecture, *Master's Degree Program in Environmental Design and Building Management, School of Architecture*, University of Navarra, 9 October 2017.
12. "Sustainable Design and Resilient Design – Concepts and Codes (Regulations)," Lecture, *Master's Degree Program in Environmental Design and Building Management, School of Architecture*, University of Navarra, 9 October 2017.
13. "Post-Earthquake Fire Performance of Buildings," Lecture, *Fire Safety Engineering Program*, Lund University, Lund, Sweden, September 12, 2017.
14. "Better Linking Fire Safety Science and Fire Safety Engineering: Research Priorities for Fire Safety Engineering," *IAFSS 12, Pre-Symposium Workshop*, Lund, Sweden, 11 June 2017.
15. "Structural Fire Performance of Earthquake-Damaged Cold Formed Steel Framed Walls: Undamaged Baseline Test," *Joint Usage Research Award Seminar*, Tokyo University of Science, Japan, 22 May 2017.
16. "Situation with Fire Safety Engineering in Countries with Performance-Based Building Regulatory Systems" *SFPE Japan Chapter*, Tokyo, Japan, November 2016.
17. "Fire Safety Challenges of Tall Timber Buildings," *SFPE Japan Chapter*, Tokyo, Japan, November 2016.
18. "Risk-Informed Performance-Based Approach for Achieving Sustainable and Resilient Architecture," *Arup Workshop on Resiliency*, Madrid, Spain, 31 October 2016.

19. "Building Codes and "Green" Building Design: Challenges and Opportunities," Lecture, *Master's Degree Program in Environmental Design and Building Management, School of Architecture, University of Navarra*, 19 October 2016.
20. "Risk-Informed Performance-Based Approach for Achieving Sustainable and Resilient Architecture," Invited Lecture, *Master's Degree Program in Environmental Design and Building Management, School of Architecture, University of Navarra*, 19 October 2016.
21. "Research into the Situation with Fire Safety Engineering in Spain," *Instituto de Ciencias de la Construcción Eduardo Torroja*, Madrid, Spain, 6 October 2016.
22. "Toward Next Generation Performance-Based Building Regulatory System," *Magisterial Presentation, Ministerio de Fomento*, Madrid, Spain, 5 October 2016.
23. "Fire Safety Challenges with Sustainable Buildings, Materials & Systems," *FORUM of Fire Research Laboratory Directors*, SP, Boras, Sweden, 26 September 2016.
24. "Toward Next Generation Performance-Based Building Regulatory System," *TNO Seminar*, TNO, Delft, the Netherlands, 25 July 2016.
25. "Research in Support of Improvement in Verification of Fire Engineered Solutions: Initial Findings & Discussion," *Scottish Government, Building Standards Division, Stakeholder Workshop*, Scottish Fire and Rescue Services Facilities, Cambuslang, Scotland, 16 June 2016.
26. "Regulations for Existing Buildings: Situation in Australia and New Zealand," *IRCC Workshop on Regulation for Existing Buildings*, Oslo, Norway, 20 May 2016.
27. "Fire Safety Challenges with Sustainable Buildings, Materials & Systems" *Australian Building Codes Board Seminar*, Canberra, ACT, Australia, March 2016.
28. "Trends in Performance-Based Building Regulation and Elevators for Evacuation," *Invited Lecture, SFPE Japan Chapter / Tokyo University of Science*, Tokyo, Japan, 8 December 2015.
29. "Post-Earthquake Fire Performance of Buildings: Full-Scale Test Outcomes and Suggestions for Performance-Based Design," *Invited Lecture, Tokyo University of Science*, Tokyo, 4 Dec. 2015.
30. "Overview of Building Regulatory System and Performance-Based Design for Fire in the USA," *Invited Lecture, Fire and Disaster Management Agency*, Tokyo, Japan, 3 Dec. 2015.
31. "Fire Safety Challenges with Sustainable Buildings, Materials and Systems," *Course Lecture – Disaster Risk Management*, Graduate School of Global Fire Science and Technology, Tokyo University of Science, Tokyo, Japan, 3 December 2015.
32. "Post-Earthquake Fire Performance of Buildings: Full-Scale Test Outcomes and Suggestions for Performance-Based Design," *Invited Public Lecture, Tokyo University of Science*, Tokyo, Japan, 27 November 2015.
33. "US Perspective on Verifying Fire Engineered Solutions as part of a Building Regulatory System," *IRCC Workshop on Verifying Fire Engineered Solutions as part of a Building Regulatory System*, Edinburgh, Scotland, 10 June 2015.
34. "Impact of Green Building Features on Firefighter Safety," *MA Dep. of Fire Services Senior Fire Officer Forum: Green Buildings: The Fire Service Challenge*, MA Fire Academy, Stow, May 2015.
35. "Fire Performance of Full-Scale Building Subjected to Earthquake Ground Motion: Overview and Key Outcomes from BNCS Project," *Operation Tomodachi – Fire Research*, A Joint Japan-USA Workshop on Large Outdoor Fires and Fire and Structure Interaction, NIST, Gaithersburg, MD, March 2015 (with Park, H-J., and Kim, J-K., presented by Meacham).

36. "Lessons Learned from the Fire and Collapse, Faculty of Architecture Building, Delft University of Technology," *Operation Tomodachi – Fire Research*, A Joint Japan-USA Workshop on Large Outdoor Fires and Fire and Structure Interaction, NIST, Gaithersburg, MD, March 2015 (with Engelhardt, M., Meacham, B.J., Kodur, V., Kirk, A., Park, H., van Straalen, I., Maljaars, J., van Weeren, K., de Feijter, R. and Both, K., presented by Engelhardt.)
37. "A Risk-Informed Performance-Based Approach for Achieving Sustainable and Resilient Architecture," *Invited Lecture, School of Architecture*, University of Navarra, 16 February 2015.
38. "Regulatory Challenges to Achieving Sustainable and Resilient Architecture," Lecture, *Master's Degree Program in Environmental Design and Building Management, School of Architecture*, University of Navarra, 16 February 2015.
39. "Overview of Qualification and Building Control During the Design Phase in the USA," *IRCC Workshop: Verification, Documentation and Control of Building Regulations in the Design Phase*, Malmo, Sweden, 4 June 2014.
40. "Assessment of Post-Earthquake Building Fire Performance," *ISO TC92 SC4 Workshop on Issues in Fire Risk*, Lund, Sweden, 6 April 2014.
41. "Outcomes of BNCS Test Program," *CUREE Workshop on Multi-Hazard Response of Structures: Earthquake and Fire*, NIST, Gaithersburg, MD, 7 January 2014.
42. "Fire Safety Challenges of Insulation Materials and Systems," MA Office of Technical Assistance & Technology, *Safe Spraying and Intelligent Insulation Workshop*, Stow, MA, 11 December 2013.
43. "Fire Challenges of Large Timber Structures," *IRCC Workshop, Use of Timber in Larger Buildings*, Vienna, Austria, 7 June 2013.
44. "New Developments in Building Control Systems," Invited Lecture, Ministry of Land, Infrastructure, Transportation and Tourism (MLIT), Institute for International Harmonization of Building and Housing (IIBH) PB Building Regulation Workshop, March 2013, Tokyo, Japan.
45. "Fire Safety Challenges of Green Buildings," *U.S. Fire Administration Invited Workshop on Changing Severity of Home Fires*, 11-12 December 2012, MFRI, College Park, MD.
46. "Web-based Resource for Advancing Performance-Based Analysis and Design for Fire," Workshop at the *SFPE Annual Meeting and Technical Conference*, Savannah, GA, 13 October 2012 (with A. Alvarez and M. Ferreira, presented by Alvarez and Ferreira).
47. "A New Paradigm and Framework for Risk-Informed Performance-Based Fire Safety Design," NIST, Gaithersburg, MD, July 2012 (with A. Alvarez, presented by Alvarez).
48. "Evacuation Modeling: Benefits and Challenges," SFPE Minnesota, Minneapolis, MN, May 2012.
49. "Building Regulatory and Control System in the United States," Invited Lecture, Ministry of Land, Infrastructure, Transportation and Tourism (MLIT), Institute for International Harmonization of Building and Housing (IIBH) and Architectural Institute of Japan (AIJ) workshop on Performance-Based Building Regulation, 15 December 2011, Tokyo, Japan.
50. "The Purpose and Meaning of Building Control: Is it Meeting Needs and Expectations," Invited Lecture, Ministry of Land, Infrastructure, Transportation and Tourism (MLIT), Institute for International Harmonization of Building and Housing (IIBH) and Architectural Institute of Japan (AIJ) workshop on Performance-Based Building Regulation, 17 Dec 2011, Tokyo, Japan.
51. "Characterization of Risk and Quantification of Design Fires," NIST, Gaithersburg, MD, 18 August 2011 (with A. Alvarez, presented by Alvarez).
52. "An International Perspective on the Regulation of 'Sustainability' in the Built Environment," Boston Society of Architects, Boston, MA, 20 April 2011.

53. "Risk Approaches and Performance Expectations," *ASTM E 05.14.01 Workshop on Exterior Fire Exposure Quantification*, Richmond, CA, 3 February 2011.
54. "Characterization of Risk and Quantification of Design Fires – Year 1 Status Report," NIST Award 60NANB10D228, NIST, 21 January 2011 (with A. Alvarez, presented by Alvarez).
55. "Research to Support Performance-Based Design in Korea," presentation on outcomes from research conducted under award from Korean Institute for Construction Technology, Gyeonggi-Do, Republic of South Korea, 18 November 2010 (with H. Park and N. Dembsey).
56. "Rail Vehicle Fire Hazard Guidance," presentation on final outcomes, DHS Award 2009-ST-108-000013, DHS, Washington, DC, June 2010 (with N. Dembsey and J. Tubbs).
57. "Rail Vehicle Fire Hazard Guidance," presentation on interim findings, DHS Award 2009-ST-108-000013, WPI, Worcester, MA, February 2010 (w/ N. Dembsey, J. Tubbs, and M. Johann).
58. "International Collaboration on Performance-Based Building Codes," *IRCC/WFTAO/NRC Workshop on Objective and Performance-Based Codes: Impacts and Lessons Learned*, Calgary, Sep. 29, 2009.
59. "International Perspectives on Performance-Based Building Codes – Issues Which Have Resulted in Change," *IRCC/WFTAO/NRC Workshop on Objective and Performance-Based Codes: Impacts and Lessons Learned*, Calgary, September 29, 2009.
60. "Performance-Based Codes and Fire Protection Design: A Global Perspective," monthly meeting, *New England Chapter, Society of Fire Protection Engineers*, 2 February 2009.
61. "Towards a Risk-Informed Performance-Based Approach to Fire Engineering and Regulation," *Invited Lecture, Civil and Environmental Engineering*, MSU, Lansing, MI, February 22, 2008.
62. "An International Overview of Performance-Based Codes and Design for Fire Safety," Invited Lecture, Instituto Ciencias de la Construcción "Eduardo Torroja," Madrid, Spain, May 9, 2007.
63. "Trends in Building Safety and Security since September 11, 2001," Invited Lecture, VTT (National Research Laboratory), Espoo, Finland, October 12, 2005.
64. "Use of Risk Concepts in Performance-Based Fire Engineering," *Wellington NZ Chapter of the Society of Fire Protection Engineers*, (Invited Speaker), Wellington, New Zealand, Mar 2005.
65. "The Current Situation of Performance-Based Fire Protection Design in the United States," *Madrid Chapter of the Society of Fire Protection Engineers*, Madrid, Spain, 15 Feb 2005.
66. "The Use of Risk Concepts in Building Regulation," *Workshop on Risk in Building Regulation*, (Invited Speaker), National Institute for Land and Infrastructure Management, Ministry of Land, Infrastructure and Transport, Tokyo, Japan, 3 February 2005.
67. "Fire Protection Engineering and Consulting," *Japan Chapter of the Society of Fire Protection Engineers*, (Invited Speaker), Tokyo, Japan, 2 February 2005.
68. "The Underlying Similarities of Existing Performance-Based Codes: A Global Perspective," EduCode 2002, Las Vegas, NV, 4 April 2002.
69. "The Underlying Similarities of Existing Performance-Based Codes," EduCode, Las Vegas, NV, 1 February 2001.
70. "Update on SFPE Technical Activities," *Invited Speaker, SFPE Connecticut Valley Chapter Meeting*, Hartford, CT, USA, 15 September 1997.
71. "Update on SFPE Technical Activities and Performance-Based Code and Fire Safety Design Method Development," *Invited Speaker, SFPE Central Ohio and Northeast Ohio Chapter Meeting*, Mansfield, OH, USA, 14 May 1997.

72. "Update on SFPE Technical Activities and Performance-Based Code and Fire Safety Design Method Development," *Invited Speaker, SFPE Pacific Northwest Chapter*, Seattle, WA, Apr 1997.
73. "Update on SFPE Technical Activities and Performance-Based Code and Fire Safety Design Method Development," *SFPE Portland Chapter Meeting*, Portland, OR, USA, 14 April 1997.
74. "Performance-Based Fire Safety Analysis & Design: An Overview," *Invited Speaker, SFPE New England Chapter Annual Seminar*, Norwood, MA, USA, 10 April 1997.
75. "Update on SFPE Technical Activities and Performance-Based Code & Fire Safety Design Method Development," *Invited Speaker, SFPE NEC Meeting*, Norwood, MA, 3 Feb. 1997.
76. "SFPE Technical Activities," *Invited Speaker, SFPE Philadelphia/Delaware Valley Chapter Meeting*, Philadelphia, PA, USA, 14 January 1997.
77. "Structure of a Performance-Based Regulatory System," *Invited Speaker, International Conference of Building Officials, Performance Advisory Committee*, St. Paul, MN, USA, 12 September 1996.
78. "An Introduction to Performance-Based Codes," *Invited Speaker, International Code Council Performance Committee*, Kansas City, MO, USA, 28 August 1996.
79. "An Introduction to Performance-Based Codes," *International Association of Fire Chiefs Fire Prevention Showcase*, Kansas City, MO, USA, 27 August 1996.
80. "Concepts of Performance-Based Fire Safety Design," *Invited Speaker, SFPE New England Chapter Seminar: Fire Risk Management*, Norwood, MA, USA, 11 April 1996.
81. "Performance-Based Codes and Design Methods: An Overview," *Invited Speaker, SFPE Dallas/Fort Worth Chapter Meeting*, Dallas, TX, USA, 29 January 1996.
82. "Performance-Based Codes and Design Methods: An Overview," *Invited Speaker, SFPE San Diego Chapter Meeting*, San Diego, CA, USA, 25 January 1996.
83. "Performance-Based Codes and Design Methods: An Overview," *SFPE Northern California/Nevada Chapter Seminar: Fire Safety Today*, San Francisco, CA, 23 January 1996.
84. "Technical Initiatives of the Society of Fire Protection Engineers," *Invited Speaker, SFPE Southern California Chapter Meeting*, Los Angeles, CA, USA, 22 January 1996.
85. "Performance-Based Codes and Design Methods: An Overview," *Guest Lecture - FPE 580J: Fire Standards in Codes*, Center for Firesafety Studies, WPI, Worcester, MA, USA, 7 December 1995.
86. "Technical Initiatives of the Society of Fire Protection Engineers," *Invited Speaker, SFPE New Jersey Chapter Meeting*, East Hanover, NJ, USA, 4 December 1995.
87. "Technical Initiatives of the Society of Fire Protection Engineers," *Invited Speaker, SFPE Chicago Chapter Breakfast, NFPA Fall Meeting*, Chicago, IL, USA, 15 November 1995.
88. "Technical Initiatives of the Society of Fire Protection Engineers," *Invited Speaker, Department of Fire Engineering, University of Canterbury*, Christchurch, New Zealand, 2 November 1995.
89. "Technical Initiatives of the Society of Fire Protection Engineers," *Invited Speaker, Society of Fire Safety*, Melbourne, Australia, 31 October 1995.
90. "Application of State-of-the-Art Detection and Alarm Technology: New Promises, New Problems," *SFPE New England Chapter Meeting*, Wayland, MA, USA, November 1991.

CONFERENCE ORGANIZING AND PROGRAM COMMITTEE SERVICE

4th International Conference on Safety in Ports (SIP), A Coruna, Spain. Organized by CESCO. Member Program Committee. May 2020.

13th International Symposium on Fire Safety Science, Special Applications Track, International Association for Fire Safety Science, University of Waterloo, Waterloo, ON, Canada, April 2020.

SFPE 2019 Annual Conference, Chandler, AZ, USA, Member Program Committee. October 2019.

10th Biennial Congress on Fire Safety Engineering: Performance-Based Design in Buildings, Industry and Transport, Member – Organizing and Program Committees. Organized by the Association of Fire Protection Engineering Professionals (APICI), Madrid, Spain. October 2019.

Workshop on Agenda 2030 for a Fire Safe World, CEN/CENELEC Building, Brussels, Belgium, December 2018.

3rd International Conference on Safety in Ports (SIP), A Coruna, Spain. Organized by CESCO. Member Program Committee. May 2018.

Fire Engineering Design Solutions: the 12th International Conference on Performance-Based Codes and Fire Safety Design Methods, Honolulu, HI, USA. Co-Chair – Program Committee. Society of Fire Protection Engineers. April 2018.

9th Biennial Congress on Fire Safety Engineering: Performance-Based Design in Buildings, Industry and Transport, Member – Organizing and Program Committees. Organized by the Association of Fire Protection Engineering Professionals (APICI), Madrid, Spain. October 2017.

FIRE SAFETY 2017, International Conference on Research and Advanced Technology in Fire Safety, Santander, Spain, Organized by the Fire Safety Engineering Group (GIDAI), University of Cantabria. Member of the Scientific Committee. 20-21 October 2017.

2nd International Fire Safety Symposium – IFireSS 2017, University of Naples, Italy. Member – International Scientific Committee. Organized by the International Council for Research and Innovation in Building and Construction (CIB) Working Group 14 (CIB W014) and Department of Structures for Engineering and Architecture, University of Naples, June 2017.

12th International Symposium on Fire Safety Science, Topic Co-Leader – Special Applications (General Session) and Organizer, Pre-Conference Workshop, Linking Fire Safety Science to Fire Safety Engineering, International Association for Fire Safety Science, Lund, Sweden, June 2017.

6th International Symposium on Human Behavior in Fire, Cambridge, England, Member – Program Committee. Organized by Interscience Communications Ltd, September 2015.

8th Biennial Congress on Fire Safety Engineering: Performance-Based Design in Buildings, Industry and Transport, Member – Organizing and Program Committees. Organized by the Association of Fire Protection Engineering Professionals (APICI), Madrid, Spain. Feb. 2015.

International Fire Safety Symposium, University of COIMBRA, Portugal. Member – International Scientific Committee. Organized by the International Council for Research and Innovation in Building and Construction (CIB) Working Group 14 (CIB W014), ISO TC 92, the University of Coimbra and Luso-Brazilian Fire Safety Association (ALBRASCI). April 2015.

World Sustainable Buildings Conference SB14, Barcelona, Spain. Member – International Scientific Committee, Organizer – Special Joint Session of IRCC / CIB TG79. Organized by the CIB, the International Institute for Sustainable Built Environment (iiBSE), the Green Building Council España (GBCE), and the Ministry of Housing, Spain. October 2014.

10th International Conference on Performance-Based Codes and Fire Safety Design Methods, Brisbane, Australia. Member – Program Committee. Conference organized by the Society of Fire Protection Engineers and the Society of Engineers Australia. November 2014.

11th International Symposium on Fire Safety Science, Topic Leader – Special Applications (General Session) and Co-Organizer, Pre-Conference Workshop, Multi-Objective Fire Safety System Design – Economy, Sustainability and Aesthetics, International Association for Fire Safety Science, Christchurch, New Zealand. March 2014.

7th Biennial Congress on Fire Safety Engineering: Performance-Based Design in Buildings, Industry and Transport, Member – Organizing and Program Committees, APICI, Madrid, Spain. Feb. 2013.

9th International Conference on Performance-Based Codes and Fire Safety Design Methods, Hong Kong, SAR China, Member – Program Committee. Organized by SFPE. June 2012.

5th International Symposium on Human Behavior in Fire, Cambridge, England, Member –Program Committee. Organized by Interscience Communications Ltd, 2012.

6th Biennial Congress on Fire Safety Engineering: Performance-Based Design in Buildings, Industry and Transport, Member – Organizing and Program Committees. Organized by the Association of Fire Protection Engineering Professionals (APICI) Madrid, Spain. February 2011.

IRCC and ICC Workshop on International Perspectives on the Role of Building Regulation in Responding to the Challenges of Climate Change, Boston, MA, Workshop organizer. Oct. 2010.

8th International Conference on Performance-Based Codes and Fire Safety Design Methods, Lund, Sweden, Member – Program Committee. Society of Fire Protection Engineers. June 2010.

Suppression and Detection Research and Applications (SupDet), Orlando, FL. Member –Program Committee. Organized by Fire Protection Research Foundation. February 24-26, 2009.

5th Biennial Congress on Fire Safety Engineering: Performance-Based Design in Buildings, Industry and Transport, Program Committees. APICI, Madrid, Spain. February 2009.

CRS Perspectives on Broadening Risk Considerations for Infrastructure Design. Workshop organizer. At Society for Risk Analysis 2008 Annual Meeting, Boston, MA. December 2008.

Architectural Heritage and Performance-Based Building Codes: Approaches and Experiences, Madrid, Spain. Workshop co-organizer with Mr. Javier Serra, Spanish Ministry of Housing. Presented by the IRCC and the Spanish Ministry of Housing. November 2008.

IRCC Session: Global Perspectives – Policy and Practice, World Sustainable Buildings Conference SB08, Melbourne, Australia. Session organizer. September 2008

IRCC Workshop on Fire Safety Criteria in Performance-Based Building Regulation, Vienna, Austria. Workshop co-organizer with Dr. Rainer Mikultis, Austrian Institute for Building Construction (OIB), Presented by the IRCC and the OIB. October 2007.

IRCC-PEER Workshop on Performance-Based Building Codes for Design, Berkeley, CA. Workshop co-organizer with Prof. Jack Moehle, PEER / University of California, Berkeley. IRCC/PEER. Oct 2006.

IRCC Invited Workshop on the Use of Risk in Regulations, San Francisco, CA. Workshop organizer. Presented by IRCC. October 2006.

IRCC Global Summit on Sustainability and Building Regulation, Gold Coast, Australia. Workshop co-organizer with Mr. Mike Balch, Australian Building Codes Board (ABCB). Presented by IRCC and ABCB. September 2005.

3rd International Symposium on Human Behavior in Fire, Belfast, Northern Ireland. Member –Program Committee. Organized by Interscience Communications, Ltd. September 2004.

IRCC Global Policy Summit on the Role of Performance-Based Building Regulations in Addressing Societal Expectations, International Policy, and Local Needs, National Research Council, Washington, DC. Chair of Organizing and Program Committees. Nov. 2003.

SFPE Symposium, Issues in Fire Risk Assessment and Management, New Orleans, LA. Chair of Organizing and Program Committees. Presented by SFPE and NSF. March 2002.

2nd International Symposium on Human Behavior in Fire, Cambridge, MA. Member –Program Committee. Organized by Interscience Communications, Ltd. March 2001.

SFPE Symposium, Risk, Uncertainty, and Reliability in Fire Protection Engineering, Baltimore, MD. Chair of Organizing and Program Committees. Presented by SFPE. March 1999.

1st International Symposium on Human Behavior in Fire, Ulster, Northern Ireland. Member –Program Committee. Organized by University of Ulster. September 1998.

2nd International Conference on Performance-Based Codes and Fire Safety Design, Maui, Hawaii. Member – Program Committee. Presented by SFPE and ICBO. May 1998.

Second International Conference on Fire Research and Engineering, Gaithersburg, MD. Member – Program Committee. Organized by SFPE. August 1997.

SFPE Focus Group on Concepts of a Performance-Based System for the U.S., Arlington, VA. Organizer. Supported by SFPE and NIST. 1996.

1st International Conference on Performance-Based Codes and Fire Safety Design, Ottawa, Canada. Member – Program Committee. Presented by SFPE. September 1996.

REFEREE / REVIEWER FOR CONFERENCE ABSTRACTS / PAPERS

1st SFPE International Conference on Performance-Based Codes and Fire Safety Design Methods

2nd SFPE International Conference on Performance-Based Codes and Fire Safety Design Methods

3rd SFPE International Conference on Performance-Based Codes and Fire Safety Design Methods

4th SFPE International Conference on Performance-Based Codes and Fire Safety Design Methods

8th SFPE International Conference on Performance-Based Codes and Fire Safety Design Methods

9th SFPE International Conference on Performance-Based Codes and Fire Safety Design Methods

10th SFPE International Conference on Performance-Based Codes and Fire Safety Design Methods

12th SFPE International Conference on Performance-Based Codes and Fire Safety Design Methods

International Fire Safety Symposium (IFireSS), Coimbra, Portugal 2015

1st International Symposium on Human Behavior in Fire

2nd International Symposium on Human Behavior in Fire

3rd International Symposium on Human Behavior in Fire

4th International Symposium on Human Behavior in Fire

5th International Symposium on Human Behavior in Fire

6th International Symposium on Human Behavior in Fire

7th IAFSS International Symposium on Fire Safety Science

8th IAFSS International Symposium on Fire Safety Science

9th IAFSS International Symposium on Fire Safety Science

10th IAFSS International Symposium on Fire Safety Science

11th IAFSS International Symposium on Fire Safety Science,

12th IAFSS International Symposium on Fire Safety Science,

FIRE SAFETY 2017, International Conference on Research and Advanced Technology in Fire Safety, Santander, Spain

4th Biennial Congress on Fire Safety Engineering: Performance-Based Design in Buildings, Industry and Transport

5th Biennial Congress on Fire Safety Engineering: Performance-Based Design in Buildings, Industry and Transport

6th Biennial Congress on Fire Safety Engineering: Performance-Based Design in Buildings, Industry and Transport

8th Asia-Oceania Symposium for Fire Science and Technology

9th Asia-Oceania Symposium for Fire Science and Technology

ASHRAE Transactions

Suppression and Detection Research and Applications – A Technical Working Conference (SupDet 2009)

EXTERNAL EXAMINER / OPPONENT FOR PHD DISSERTATIONS

Fire Safety Design of Road Tunnels, Jonatan Gehandler, Ph.D. Dissertation, Lund University, Lund, Sweden. Opponent. February 2020.

Assessing Fire Safety of Fibre Reinforced Polymer Composite Ship Structures, Franz Evegren, Ph.D. Dissertation, Lund University, Lund, Sweden. Opponent. October 2017.

Multiple Vehicles Design Fire Scenarios in Car Parking Buildings, Mohd Zahirasri bin Mohd Tohir, Ph.D. Dissertation, University of Canterbury, Christchurch, New Zealand. External Examiner. Sep. 2015.

Rail Tunnel Evacuation, Karl Fridolf, Ph.D. Dissertation, Lund University, Lund, Sweden. Member of Examination Committee. June 2015.

Engineering Safety. Application to Fire Safety Design of Buildings and Road Tunnels, Henrik Bjelland, Ph.D. Dissertation, University of Stavanger, Stavanger, Norway. Served as First Opponent. Nov. 2013.

The Real Cost of Fire in Australia, Brian Ashe, Ph.D. Dissertation, Macquarie University, Sydney, New South Wales, Australia. External Examiner. February 2012.

PHDS, MS THESES, AND GRADUATE RESEARCH PROJECTS

PhD Dissertations

Jugs Ale, Ph.D. (October 2019). Worcester Polytechnic Institute. *Social enterprises in the supply chain – A Case Study in Fire Prevention*, Department of Management, Foise School of Business. Co-advisor. Primary advisor Prof. Joseph Sarkis, Prof. Sharon Johnson and Prof. Frank Hoy co-advisors.

William Ivans, (December 2017), WPI. *A Framework for Assessing the Technical Quality and Adequacy of Performance-Based Design approaches to Fire Safety Engineering*. Primary advisor. Co-advisors: N. Dembsey, WPI, and Dr. Stephen Unwin, Pacific Northwest National Laboratories.

Amaya Osacar (October 2017), University of Navarra. *Establishing a Performance-Based Fire Safety Strategy Approach for Existing Buildings*, Ph.D. research, University of Navarra, Pamplona, Spain. Co-Supervisor. Primary supervisor Prof. Juan Echevarria, University of Navarra.

Gregory Gorbett (October 2015), WPI. *Development and Assessment of a Decision Support Framework for Enhancing the Forensic Analysis and Interpretation of Fire Patterns*. Primary advisor. Dissertation Committee included Prof. N. Dembsey, FPE and Christopher Wood, FPE (adjunct) and Firelink LLC.

Haejun Park (February 2014), WPI. *Increasing Building Fire Safety by Bridging the Gap between Architects and Fire Safety Engineers*. Primary advisor. Dissertation Committee included Prof. N. Dembsey, FPE and Prof. Mark Goulthorpe (MIT Architecture).

Alberto Alvarez (February 2012). *An Integrated Framework for the Next Generation of Risk-Informed Performance-Based Design Approach used in Fire Safety Engineering*. Primary advisor. Dissertation Committee included Nicholas Dembsey (WPI FPE) and J. Russell Thomas, Head of Fire Research, National Research Council, Canada.

In Progress

Majed Almejmaj, PhD Candidate, Worcester Polytechnic Institute. *Investigation of Cultural Factors Impacting Emergency Evacuation in Saudi Arabia*, Primary advisor. Dissertation Committee includes Prof. N. Dembsey, FPE, Jeanine Skorinko, SSPS, Michael Radzicki, SSPS.

Michael Stromgren, PhD Candidate., Lund University. *Data and Framework for Building Fire Safety Policy Decision* (tentative title), Co-Supervisor. Primary supervisor Prof. Patrick van Hees, Lund University.

Antonio Leiras, PhD Candidate. University of Coimbra. *Development of Fire Risk Assessment Method for Buildings Using a Risk Index Approach*, Co-Supervisor. Primary supervisor Prof. Joao Paulo Rodrigues.

Paulo Prata Ramos, PhD Candidate, University of Coimbra, *Prospects for the implementation of a fire safety performance-based code in Portugal*, Co-Supervisor. Primary supervisor Prof. Joao Paulo Rodrigues.

MS/MA Theses

Jin Kyung Kim (May 2014), MS, WPI. *Seismic Performance of Fire Protection Systems and Post-Earthquake Fire Performance of Buildings*. Advisor. Reader N. Dembsey.

Robert Neale (May 2013), MA, Naval Post Graduate School and U.S. Department of Homeland Security, Center for Homeland Defense and Security. *Evaluating the Arson Scenario: A Policy Option Analysis of the Physical Security Criteria for Federal Facilities Design Basis Threat*. Reader. Advisor Dr. Tom Mackin, Professor, California Polytechnic, San Luis Obispo.

Adam Tracy (May 2010), WPI. *The Implementation of Residual Risk Analysis for Explosion Protection Systems*. Co-advisor. Prof. K. Notarianni, FPE, advisor, and Randal Davis (Fenwal), co-advisor.

Matthew A. Johann (May 2002), WPI. *Fire-Robust Structural Engineering: A Framework Approach to Structural Design for Fire Conditions*. Co-advisor. Prof. L. Albano and Prof. R. W. Fitzgerald, advisors.

Scott Laramee (May 1999), WPI. *Performance-Based Approach for Analysis and Evaluation of Aircraft Hangars and Similar High Ceiling Spaces*, Co-advisor. Prof. N. Dembsey, advisor.

Armin Wolski (May 1999), WPI. *Addressing Building Fire Safety as an Acceptable Risk Problem – A Guide for Developing Performance-Based Fire Safety Regulations*. Co-advisor. N. Dembsey, advisor.

Graduate Independent Study Projects (ISGs)

Woojung Park (July 2017). *Marina Risk Reduction*. Graduate Independent Study Project. Advisor.

Mai Tomida (December 2015). *Case Studies on Building Fire Impacts to the Environment*. Advisor.

Mary Long (May 2015). *Impact of Smoke Compartment Size on Horizontal Evacuation Time in Healthcare Facilities*. Advisor.

Camille Levy (May 2015). *Assessing Variability in Engineer Selection of Tenability Criteria*. Advisor.

Ian Jutras (May 2015). *A Framework for Performance-Based Design and the Development of Objective-Criteria-Scenario Triplets*. Advisor.

Drew Martin (May 2015). *Quantification of Green Building Features on Firefighter Safety: Test Rig Development and Risk-Based Safety Assessment Tool*. Advisor.

- Manuel Hurtado (October 2014). *Development of Design Fire Heat Release Rate Catalog and Database*. Graduate Independent Study Project. Advisor.
- Ian Jutras (August 2014). *A Proposed Approach for Developing and Presenting Fire Scenarios, Design Fires and Criteria for Regulation and Design*. Advisor.
- Drew Martin (May 2014). *Quantification of Green Building Features on Firefighter Safety*. Graduate Independent Study Project. Advisor.
- Minchao Yin (December 2013). *Quantification of Green Building Features on Firefighter Safety*. Graduate Independent Study Project. Advisor.
- James Grimard and Samantha Sinapi (December 2013). *Characterization of Aging, Overweight and Disabled Populations and Impacts on Evacuation from High-Rise Buildings*. Advisor.
- Jin Kyung Kim (May 2012). *Seismic Performance of Fire Protection Systems and Post-Earthquake Fire Performance of Buildings*. Advisor. (Transitioned to MS thesis in 2012).
- William Ivans (May 2012). *Characterization of Building Types and Quantification of Design Fires*. Advisor.
- Juan Echeverria (May 2011). *Development of a Performance-Based Approach to Addressing Fire Safety in Existing Buildings*. Advisor.
- Shane Cherney (May 2011). *Characterization of Building Types and Quantification of Design Fires*. Graduate Independent Study Project. Advisor.
- Arthur Gager (May 2011). *Quantification of Design Fires (S11)*. Advisor.
- Donald Havener (May 2011). *Data for Validation, Verification and Algorithm Development of the Egress Model Pathfinder*. Advisor. Co-advisor Charlie Thornton, Thunderhead Engineering.
- Kevin Black (May 2011). *People and Fires*. Advisor.
- Kurt Schebel (December 2009 and May 2010). *Rail Vehicle Fire Hazards*. Advisor. Co-advisors Prof. N. Dembsey, WPI, and Mr. J. Tubbs, Arup. Mr. Schebel was awarded the **2011 SFPE Education and Scientific Foundation Student Scholar Award** for his work.
- Christine Chioffi (May 2010). *VID System Development to Improve Fire Detection for Fire Protection Engineering Applications*. Advisor. Co-advisors Prof. Ali Rangwala, FPE, Prof. Humi, Math, Dr. Daniel Gottuk, Hughes Associates.
- Mohammed Saleh (May 2010). *Fire Risk Assessment in a Petroleum Processing Facility*. Advisor.
- Alberto Alvarez (May 2009). *Fire Risk Assessment in French Petrochemical Facilities*. Advisor.
- Robert Accosta (December 2008 and May 2009). *The Effect of Sprinkler Sprays on Fire Induced Mass Flow Rates*. Graduate Independent Study Project. Advisor. Co-adviser Prof. N. Dembsey.
- Alberto Alvarez (December 2008). *New Perspective on Performance-Based Design for Fire*, Graduate Independent Study Project. Advisor.
- Amanda Moore (May 2003). *Development of Design Fires for Structural Fire Protection*. Graduate Independent Study Project. Co-advisor. Primary advisors Prof. L. Albano, and Prof. R. W. Fitzgerald.
- Jennifer Sapochetti (May 2000). *Evaluating the Usability of Performance-Based Codes and Engineering Guides*. Co-advisor. Primary advisor Prof. N. Dembsey.

COURSES DEVELOPED AND TAUGHT

Worcester Polytechnic Institute (WPI), Worcester, MA, USA

As tenured Associate Professor, developed and taught the following courses:

- FPE 555, *Detection, Alarm and Smoke Control* (graduate (MSc/PhD))
- FPE 571, *Performance-Based Design* (graduate (MSc/PhD))
- FPE 580M, *Fire Risk and Regulatory Policy* (graduate (MSc/PhD))
- FPE 580N, *People and Fire* (graduate (MSc/PhD))
- FPE580R, *Fire Risk Assessment* (graduate (MSc/PhD))
- FPE3080, *Introduction to Building Fire Safety Systems Design* (undergraduate (BSc))

Universidad Carlos III de Madrid, Madrid, Spain

Co-developer of program, Member of External Council of Direction, and Lecturer, (2006-2008), professional Master's Degree program in Fire Safety Engineering. Funded by the Spanish Association of Fire Protection Engineers (Asociación de Profesionales de Ingeniería de Protección contra Incendios (APICI)), Metro de Madrid and others, this was the first university-level Master's program in fire safety engineering in Spain. I was part of the team that developed the overall program, including topic areas and content. I developed and taught the module on Performance-Based Design. This program was transitioned to Comillas Pontifical University in Madrid in 2009.

Society of Fire Protection Engineers, USA

- Developed and taught SFPE Seminar *Fire Safety Design Challenges for Very Tall Buildings* (2014 -)
- Co-developed the SFPE/ICBO/IFCI Seminars *Engineering Fire Safety Alternatives* and *Introduction to Computer Fire Modeling* (1997)
- Co-developed and co-taught the SFPE Short Course *Introduction to Performance-Based Design for Fire Protection Engineers* (1995 – 1997)
- Co-developed and co-taught the *SFPE Tutorial Performance-Based Fire Detection and Signaling Systems* (1993 –1995)