NICHOLAS ALEX DEMBSEY

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Expertise:
Fire Safety Engineering Science, Civil Engineering Materials, Combustion, Heat Transfer

Education:
- Ph.D. Civil Engineering (Fire Safety Eng. Sci.), University of California, Berkeley, 1995
- M.S. Civil Engineering, University of California, Berkeley, 1988
- B.S.E. Civil Engineering (summa cum laude), University of Michigan, Ann Arbor, 1986

Present Position:
Professor of Fire Protection Engineering

Honors:
- SFPE's 2014 Jack Bono Award (Best JFPE paper for 2013)
- Honorable Mention Best Paper 9th International Symposium on Fire Safety Science, 2008
- Best Overall Technical Paper Award at Composites and Polycon 2007
- Society of Fire Protection Engineers, Hat's Off Award, 2000
- Salamander (honorary), 1997

Societies:
- Combustion Institute
- International Association for Fire Safety Science
- National Fire Protection Association
- Society of Fire Protection Engineers – Fellow

Editorial Boards:
- Fire and Materials

Professional Certification:
- Registered Professional Engineer, Fire Protection, California (#FP1349)

Nicholas Alex Dembsey

Curriculum Vitae

31 December 2021

1 Education

1.1 Degrees

1.1.1 1986 – Bachelor of Science in Engineering, Civil Engineering (summa cum laude), University of Michigan, Ann Arbor.

1.1.2 1988 – Master of Science, Civil Engineering, University of California, Berkeley.

1.1.3 1995 – Doctor of Philosophy, Civil Engineering (Fire Safety Engineering Science), University of California, Berkeley. Dissertation: "Compartment Fire Measurements and Analysis for Near Field Entrainment, Model Evaluation and Wall Lining Fire Growth", Co-Chairs: Professors P.J. Pagni and R.B. Williamson.

1.2 Professional Certification

1.2.1 1995 – Registered Professional Engineer, Fire Protection, California (#FP1349).

2 Work Experience Other than Teaching

2.1 University of California Berkeley

2.1.1 1987 – 1995. Fire Research Laboratory, Research Assistant: Responsibilities involved maintenance/improvement of instrumentation and data reduction software associated with oxygen consumption calorimetry. Also responsible for running full-scale fire experiments for research projects and for industry sponsors. Experiments primarily involved measuring the heat release rate of various full-scale configurations for fire hazard evaluation and conducting ASTM E119 wall furnace tests.

2.1.2 1995 (Summer). Department of Mechanical Engineering, Visiting Post-Doctoral Researcher: Under the direction of Professor P.J. Pagni, studied fire hardening strategies for structures in the wildland/urban intermix.

2.2 Fire Science Consultant

2.2.1 1990 – Present. See Item 16 below for consulting details.

3 Teaching Experience

3.1 University of California Berkeley

3.1.1 1988 – 1989. Teaching Assistant, Department of Civil Engineering.

3.2 WPI

3.2.1 1995 – 2001. Assistant Professor of Fire Protection Engineering.

3.2.2 2001 – 2010. Associate Professor (with tenure) of Fire Protection Engineering.

3.2.3 2010 – present. Professor (with tenure) of Fire Protection Engineering.

3.2.4 2012 – 2016. Collaborative appointments in Mechanical and Civil Engineering.

3.2.5 2015 – 2016. Collaborative appointment in Chemical Engineering.

3.2.6 2016 – 2021. Collaborative appointments in Chemical, Civil and Mechanical Engineering.

3.2.7 2021 – 2022. Collaborative appointments in Civil and Mechanical Engineering.

4 Teaching Innovations at WPI

4.1 Distance Learning

4.1.1 FP521 Fire Dynamics I. 1995 – 2010, 2013-2020. Blended (on campus and distance) course format. Lectures, discussion format, exams, homework, course web page, and its content and technology are updated on a regular basis.

4.1.2 FP553 Fire Protection Systems. 1996 – 1999. Blended (on campus and distance) course format. Lectures, discussion format, exams, homework, course web page, and its content and technology were updated on a regular basis.

4.1.3 FP520 Fire Modeling. 2002 – Present. Blended (on campus and distance) course format. Lectures, discussion format, exams, homework, course web page, and its content and technology are updated on a regular basis.

4.1.4 FP571 Performance-Based Design. 2022 – Present. Blended (on campus and distance) course format. XXXX.

4.2 New Courses Significantly Updated or Developed

4.2.1 FP521 Fire Dynamics I. Fall 1995 and Fall 1996: Developed conference section lectures (video) to accompany original Barnett video. Developed new problem sets at students' request and exams to supplement video lectures.

4.2.2 FP553 Fire Protection Systems. Fall 1996: Developed conference section lectures to accompany original Zalosh lecture video. Developed new exams to supplement video lectures. Additionally, a design studio (taught by R. Pehrson) was implemented on an experimental basis to provide the students with expanded exposure to the required material.

4.2.3 FP521 Fire Dynamics I. Fall 1997: The course was completely reorganized so that lectures, discussion sections and assignments would constitute a tightly coherent package suitable for both on campus and off campus students. All the lectures were rewritten and taped. A majority of the lectures were entered into PowerPoint for later web page use. The problem sets were expanded and reorganized. New exams were developed.

4.2.4 FP587 Fire Science Laboratory. Spring 1997: The course format was completely reorganized to integrate hands-on work with state-of-the-art laboratory apparatuses in conjunction with a thorough discussion of the underlying principles of fire dynamics. The difficulty of analyzing actual experimental data (including experimental error) was emphasized.

4.2.5 FP521 Fire Dynamics I. Spring 1998: The course web page was started and completed. Course material was posted to the web for download: lecture notes, handouts, assignments, and homework solutions. The web was used as the primary material source for both on campus and off campus students. Lectures not entered into PowerPoint during Fall 1997 were finished and videoed. Additional problem sets were added. Exams were updated.

4.2.6 FP587 Fire Science Laboratory. Spring 1999: The course format was significantly updated. Primary areas of focus were: Refining the presentation of theory as related to the experiments conducted, and comprehensive treatment of the procedure of acquiring raw data, converting raw data to engineering units and calculating characteristics of interest.

4.2.7 FP553 Fire Protection Systems. Fall 1999: Updated conference section lectures to accompany new (Fall 1998) Zalosh lecture video. Updated exams and additional homework assignments were added.

4.2.8 FP521 Fire Dynamics I. Fall 2000: All the lectures were updated and videoed again. New exams were developed. MyWPI was used as the primary material source for both on campus and off campus students.

4.2.9 FP587 Fire Science Laboratory. Spring 2001: The course format was significantly updated. Primary areas of focus were: The addition of new material on thermocouples and heat flux gauges, the development of an end of the semester full scale compartment fire project that was integrated with previous small scale experiments and lecture material, and refining the presentation of theory as related to the experiments conducted. MyWPI was used as the primary material source for on campus students.

4.2.10 FP520 Fire Modeling. Spring 2002: The course format was completely reorganized to develop student knowledge of two key fire models used by practitioners through extensive application of the models to various fire scenarios. The models used were CFAST, a zone or control volume model, and FDS, a CFD model. Model application involved essentially weekly assignments (briefings) with the models. The briefings were discussed each week in class using a format of a junior engineer reporting to a senior engineer on their progress learning the model. Additionally, the underlying principles of fire dynamics, fluid mechanics, heat transfer and combustion in the models were addressed with all new lectures.

4.2.11 FP587 Fire Science Laboratory. Spring 2003: The course content was reorganized to focus assignments on key aspects of course knowledge and to strike a better balance between hands-on laboratory work and in-class lectures on background materials.

4.2.12 FP520 Fire Modeling. Spring 2004: The course format was continued, however, it was significantly updated. To further develop the student's confidence in their mathematical and abstracting abilities a Student Model was assigned. The Student Model was specified as part of the course assignments and implemented by each student in Excel throughout the semester. Implementation required knowledge of basic methods such as numerical differentiation and finite difference. The assignments involving CFAST and FDS were also refined in relation to student abstracting ability. Additionally, an ISG was supervised to further develop combustion lecture notes.

4.2.13 FP521 Fire Dynamics I. Fall 2005: Exams were updated. New homework problems were used. Exam and homework emphasis on numerical methods such as Runge Kutta was increased.

4.2.14 FP580P Fire and Materials. Spring 2007: In the modern era (and more so in the future) fire engineers have a need to simulate fire growth using tools such as CFAST and FDS. How to do this correctly will set the context for this course. How to properly characterize the fire behavior of combustible materials via appropriate parameters or "effective properties" is the main topic of this course. Methodologies for characterizing materials ranging from fire dynamics based indexing to varying complexity pyrolysis models will be studied. Appreciation for empirical techniques needed to characterize materials will be introduced via lab demonstrations and exercises involving modern fire testing apparatuses. Students will start with the raw test data and learn how to develop appropriate parameters or "effective properties" for the methodology of interest.

4.2.15 FP521 Fire Dynamics I. Fall 2008: Course lecture format was changed to problem solving based. Example problem solutions for lecture were developed to focus students' work and understanding on key aspects of each week's assignments (reading and homework). A new textbook was introduced with new reading assignments. This new book complements the "old" textbook which is still used as it is quite relevant. New homework assignments were developed. New exams were developed. Emphasis on numerical methods (Runge and Kutta) continues in the homework and exam assignments.

4.2.16 FP520 Fire Modeling. Spring 2009: The course format was significantly revised. Two primary areas are focused on: CFD based fire model FDS and a zone based student model. The 2D CFD student model from Spring 2008 was dropped due to student inability to relate to this model in terms of developing their abstracting ability. The course format is example driven in terms of learning how to use correctly the complex tool FDS. Extensive use was made of the official FDS web page and reference materials to allow the students to learn the basics of the model, study verification cases as well as validation cases. Students were asked to research the literature to find their own validation cases. A select set was used to further study aspects of FDS. Since the students are not required to have advanced numerical background for this course, an ODE based zone model was assigned to them to be developed in Excel. This builds directly on the Runge Kutta work from FP521 and requires the student to solve for the 3 gas phase ODEs and one algebraic equation, two PDEs via explicit FD for the condensed phase (ceiling and floor), and incorporation of a radiation network as well as a combustion model. These 3 characteristics form the basis of any fire model and allow the students to develop their abstraction abilities to understand characteristics of more complex tools such as FDS. The seminar format works well where students are asked to discuss their assignments each week as well as use Discussion Boards during the week between classes. Limited formal lectures are given and the "in class" time is focused on having the students discuss what they understand and do not understand about the models that they are asked to work with.

4.2.17 FP521 Fire Dynamics I. Fall 2009: Course format from Fall 2008 was refined. The primary focus remains problem solving. Discussion (Key) Points for each week's material was developed and used to introduce, direct and focus student's reading of the texts. New exams were developed. Emphasis on numerical methods (Runge and Kutta) continues in the homework and exam assignments.

4.2.18 FP520 Fire Modeling. Spring 2010: Requested and received the installation of new hardware in FLTV to enhance discussion format of the course. The hardware allows switching between multiple laptops and the instructor's computer such that all the output from all these computers can be incorporated into the class video. This greatly improves the quality of class discussion as multiple student assignments can be incorporated in parallel into the discussion.

4.2.19 FP587 Fire Science Laboratory. Spring 2011: The course content was updated to focus on hands-on laboratory work, and in-class discussions on the background materials and assignments.

4.2.20 FP520 Fire Modeling. Fall 2011: The course content was reorganized to focus on the student model, increasing the number of FDS simulations and providing increased structure to assignments.

4.2.21 FP580T Fire and Materials. Spring 2012: In the modern era fire protection engineers have an increasing need to simulate condensed phase material pyrolysis as part of fire growth simulations. Pyrolysis models ranging from algebraic/geometric to PDE based will be studied. Methodologies to properly characterize the fire behavior of combustible materials via appropriate parameters or effective properties are the main topic of this course.

4.2.22 ES3005 Radiation Heat Transfer Applications. Fall 2012 (A Term): Radiation Heat Transfer Applications will develop the student's knowledge of radiation heat transfer. Fundamentals of radiation will be covered. The primary focus of the course will be on applications of radiation heat transfer in the built environment. Two key areas will be solving radiation problems related to building fires (infrared) and building environmental heating (solar).

4.2.23 FP520 Fire Modeling. Fall 2012: The course content was significantly refined increasing the number of FDS simulations and providing increased structure to assignments which more clearly focused on specific aspects of FDS physics and chemistry.

4.2.24 FP521 Fire Dynamics I. Fall 2013: Course format from Fall 2009 was refined. The primary focus remains problem solving. Discussion (Key) Points for each week's material was developed and used to introduce, direct and focus student's reading of the texts. New exam formats were developed. Emphasis on numerical methods (Runge and Kutta) continues in the homework and exam assignments.

4.2.25 FP520 Fire Modeling. Spring 2014: Course format from Spring 2012 was refined. In collaboration with Casey Grant of the FPRF the final project was based on the Cocoanut Grove Fire.

4.2.26 ME442X Radiation Heat Transfer Application and Design. A Term 2015: Radiation Heat Transfer Application and Design will develop the student's knowledge of radiation and multi-mode heat transfer. Fundamentals of radiation will be covered: radiative properties of surfaces; view factors; exchange between black and grey surfaces; emission and absorption of gases; and flame radiation. Use of numerical methods will be emphasized as appropriate for solution of applications: the select numerical methods (numerical integration, matrix methods, ODE solutions) can be learned during the course. The course will conclude with a design exercise to be completed by each student. Each exercise will highlight radiation in a realistic scenario that requires multi-mode heat transfer and fluid mechanics analysis to develop the design solution. Exercise topics will come from subjects such as: solar power plants, solar effects on buildings, furnaces, fire safety in the built environment, etc.

4.2.27 ME442X (ME4424) Radiation Heat Transfer Application and Design. A Term 2016: Course format from A Term 2015 was significantly refined based on student feedback and instructor observations. Homework assignments were more evenly distributed during the first half of the course. The final project was introduced at the beginning of the course. The reporting format for the projects was changed to include student presentations.

4.2.28 FP520 Fire Modeling. Spring 2019: New slides were added to enhance homework review with students.

4.2.29 ES3003 Heat Transfer. D Term 2019: Taught for the first time. Course format was based around using example problems to discuss course topics.

4.2.30 FP521 Fire Dynamics I. Fall 2019: Course videos were changed to a "short" clip asynchronous format considered more suitable for online learning.

4.2.31 FP520 Fire Modeling. Spring 2020: Course videos were changed to a "short" clip asynchronous format considered more suitable for online learning.

4.2.32 ES3003 Heat Transfer. D Term 2020: Course format was changed to be based around using lecture slides to discuss course topics. Lectures were delivered asynchronously via Echo360 as the course was fully online.

4.2.33 FP521 Fire Dynamics I. Fall 2020: A weekly synchronous discussion section (Zoom based) was added to the "short" clip video format from Fall 2019

4.2.34 FP520 Fire Modeling. Spring 2021: Course format updated to a mix of synchronous (Zoom) and asynchronous ("short" clip videos) interactions for the students in a fully online format.

4.2.35 ES3003 Heat Transfer. D Term 2021: Course format was updated to a mix of synchronous (Zoom) and asynchronous (lecture videos) as the course was fully online.

4.2.36 FP520 Fire Modeling. Fall 2021: Course format completely reworked to use PyroSim/FDS as the primary modeling tool for study of CFD based fire models. Conducted as a ISG in an online synchronous (Zoom) format.

4.2.37 FP571 Performance-Based Design. Spring 2022.

4.2.38 ME4424 Radiation Heat Transfer Application and Design. C Term 2022

4.2.39 ES3003 Heat Transfer. D Term 2022.

5 Courses Taught at WPI

5.1 Assistant Professor, 1995 – 2001

5.1.1 FP521 Fire Dynamics I. FP553 Fire Protection Systems. FP587 Fire Science Laboratory. See tables below for further details.

5.2 Associate Professor, 2001 – 2010

5.2.1 FP520 Fire Modeling. FP521 Fire Dynamics I. FP553 Fire Protection Systems. FP587 Fire Science Laboratory. FP580P Fire and Materials. See tables below for further details.

5.3 Professor, 2010 – Present

5.3.1 FP 520 Fire Modeling. FP521 Fire Dynamics I. FP587 Fire Science Laboratory. FP580T Fire and Materials. ES3005 Radiation Heat Transfer Applications. ME4424 Radiation Heat Transfer Application and Design. ES3003 Heat Transfer. See tables below for further details.

	Course Population Summary Based on Semester Grade Sheets. Courses listed as "191" are on campus sections, as "1950(60)" are ADLN sections, as "ISG" are independent study sections, and as “100” and “101” are CPE sections.									
Course Taught	Semester and Year									
	F95	S96	F96	S97	F97	S98	F98	S99	F99	S00
FP521 191	31	5	17	14	5	8	9	7	24	5
FP521 1950	1	6	7	6	4	9	8	14	6	7
FP553 191			17		32				20	
FP553 1950					12				14	
FP553 ISG		7								
FP587				13				8		

Course Taught	Semester and Year									
	F00	S01	F01	S02	F02	S03	F03	S04	F04	S05
FP521 191	14	10	17	7	12	13	14	12	16	10
FP521 1950	5	15	16		24		14		20	
FP587		7				9				
FP520 191				16				16		
FP520 1950				13				14		
Course Taught	Semester and Year									
	F05	S06	F06	S07	F07	S08	F08	S09	F09	S10
FP521 191	17	16	12	11	13	15	9	11	14	10
FP521 1950	20		12		19	10	9	25	4	20
FP521 100								13		
FP521 101								7		
FP580P				5						
FP520 191		13				7		12		10
FP520 1950		14				9		7		8
Course Taught	Semester and Year									
	F10	S11	F11	S12	F12	S13	F13	S14	F14	S15
FP521 191	16						18		22	
FP521 1960	10						21		20	
FP520 191		7	3		9			10		13
FP520 1960		16	7		9			22		14
FP587 191		11								
FP580T 191				15						
ES 3005					5					
Course Taught	Semester and Year									
	F15	S16	F16	S17	F17	S18	F18	S19	F19	S20
FP521 191	22		19		19		16		16	
FP521 1960	24		25		24		21		22	
FP520 191		16		12		6		7		10
FP520 1960		19		13		10		8		5
ME442X (4424)	6		8		1					
ES3003								64		84
Course Taught	Semester and Year									
	F20	S21	F21	S22	F22	S23	F23	S24	F24	S25
FP521 191	19									
FP521 1960	22									
FP520 191		7	1							
FP520 1960		4								
ES3003		77								

	Course Population Summary Based on Evaluation Forms on File at WPI.									
Course Taught	Semester and Year									
	F95	S96	F96	S97	F97	S98	F98	S99	F99	S00
FP521	26	2	12	13	5	9	8	13	18	N/A
FP553			17		28				20	
FP587				13			8			
Course Taught	Semester and Year									
	F00	S01	F01	S02	F02	S03	F03	S04	F04	S05
FP521	14	14	23	13	8	11	16	8	17	10
FP587		7				9				
FP520				15				20		
Course Taught	Semester and Year									
	F05	S06	F06	S07	F07	S08	F08	S09	F09	S10
FP521	22	11	10	10	14	15	12	23	11	14
FP580P				4						
FP520		9				9		15		8
Course Taught	Semester and Year									
	F10	S11	F11	S12	F12	S13	F13	S14	F14	S15
FP521	16						19		24	
FP520		13	5		11			22		15
FP587		10								
FP580T				10						
ES3005					4					
Course Taught	Semester and Year									
	F15	S16	F16	S17	F17	S18	F18	S19	F19	S20
FP521	28		21		11		11		19	
FP520		15		11		1		8		7
ME442X(4424)	5		6		1					
ES3003								35		36
Course Taught	Semester and Year									
	F20	S21	F21	S22	F22	S23	F23	S24	F24	S25
FP521	23									
FP520		8	0							
ES3003		20								

6 IQPs, MQPs, Sufficiencies, Theses and Dissertations Advised or Co-advised

6.1 IQPs

6.1.1 None.

6.2 MQPs

6.2.1 Gosselin, S. and Hastings, K., "Set-up and Operation of the WPI Fire Room and Room Calorimeter", 1996. (Major Advisor: Prof. Barnett).

6.2.2 Convery, James J., "Design and Code Issues Pertaining to the Gas Delivery System for the WPI Fire Science Laboratory", 1996.

6.2.3 Alston, J.J., Ayers, S.D., Fay, T.S., Lautenberger, C.W., Prueher, C.S., and Watson, J.J., "Flame Spread Modeling Using a Computer Zone Model and Full-scale Room Fire Calibration", 1999. (Major Advisor: Prof. Barnett).

6.2.4 Adams, V., Han, Z., Southard, S., and Su, C., "The Effect of Sprinkler Spray on Combustion Products Leaving a Compartment", 2010. **Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.2.5 Fast, N., Winsten, R., Hao, B., and Chu, Y., "D3 Nozzle Characterization", 2011. **Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.2.6 Boutin, V., Eng, A., Gorgone, M., Guilfoyle, M., Mitchell, C., and Tuttle, C., "Development of a Flame Spread Screening Tool For Fiber Reinforced Polymers", 2012.

6.2.7 Da Vitoria, A., Martin, D., Ji, Y.B., and Zhang, L., "Adding Mobility to a Fire Products Collector", 2012.

6.2.8 Acosta, C., Mahoney, S., Nava, N., and Wright, W., "Evaluation of Fiber Reinforced Polymer Bench Scale Specimen Sizes and Prediction of Full Scale Flame Spread Testing for Building Applications", 2013. **Award winner in ME.**

6.2.9 Czarnowski, J., Nich, K., and Zichelli, K., "FRP Thermal Properties and Fire Performance for Building Exterior Applications", 2013.

6.2.10 Faszewski, T., “Linear Heat Detection Placement”, 2013.

6.2.11 Gillespie, B., Long, M., McMillan, N., and Walde, C., “Determining Limitations of Kinetic Models for Pyrolysis Simulation of Fiber Reinforced Polymer Composites”, 2014. **Award winner in ChE. Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.2.12 Ciampa, C., Forbes, E., and Kawalya, D., “Design of an Intermediate Scale Test Rig for Exterior Wall Assemblies”, 2014. **Award winner in ME.**

6.2.13 Harbold, J., Kerrigan, B., Levy, C., and Meehan, S., “Smoke Flow Through Exterior Assembly Construction Gaps”, 2014.

6.2.14 Gendreau, Z., Marin, N., Morrissey, J., and Rancourt, T., “Heat Transfer into Wall Panel Connections from Residential Scale Fires”, 2014. **Honorable Mention in ME.**

6.2.15 Anaya, J., Herrera, R.C., Morgan, D., “Prediction of Fire Test Performance Based on Varying FRP Resin/Fire Retardant Additive Ratios”, 2014. **Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.2.16 Anderson, K., Grimes, V., Stewart, Z., Wang, S., “Micro-scale Testing of Fiber Reinforced Polmers”, 2015. **Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.2.17 Buxton, T., Miner, E., Payret, A., Xu, J., “Flame Retardant FRP Additives and Pyrolysis Modeling Software”, 2015. **Award winner in ChE. Peer-Reviewed Journal Article, see Item 9 below.**

6.2.18 Cornachini, B., Foley, M., Knight, S., Ritchey, T., “Calibration of an Intermediate Scale Fire Test Rig for Exterior Wall Assemblies: Source Fire”, 2015.

6.2.19 Gillis, S., Houghton, N., Scott, D., Weiler, J., “Calibration of an Intermediate Scale Fire Test Rig for Exterior Wall Assemblies: Instrumentation and Insulation”, 2015.

6.2.20 DuBois, L., McNally, A., He, Z., “Effects of Intumescent Layering on Pyrolysis of FRP Systems”, 2016.

6.2.21 Dong, J.M., Rice, S., Schiffhauer, E.M., Sullivan, K., “NFPA 285 Screening Rig Evaluation”, 2016.

6.2.22 Esteve, P., Klose, A., Washburn, T., “Behavior of a Fiber Reinforced Load Bearing Wall”, 2016. **Award winner in ME.**

6.2.23 Ascani, P., Curran, G., Paing, S.S., Werth, M., “Materials Fire and Thermal Performance: Low-E Windows”, 2017.

6.2.24 Igoe, J., Ing, A., Lynch, K., Martel, D., Renner, L., Sharp, T., Smith, A., Thulin, S., "Design of Small-Scale Furnace for Fire Resistance Testing of Building Construction Materials", 2017. **Award winner in ME.**

6.2.25 Brokaw, F., Deidrich, C., Finacom, R., Ramos, J.P., "FRP Curtain Wall Design and Intermediate Scale NFPA 285 Test", 2018.

6.3 MS Theses

6.3.1 Dell'Orfano, M.E., "Fire Behavior Prediction and Fuel Modeling of Flammable Shrub Understories in Northeastern Pine-Oak Forests", 1996.

6.3.2 Grenier, A.T., "Fire Characteristics of Cored Composite Materials for Marine Use", 1996. (Major Advisor: Prof. Barnett). **Peer-Reviewed Journal Article, see Item 9 below.**

6.3.3 Anderson, S.K., "Qualitative Study of the Effect of a Compartment Enclosure on Fire Plume Entrainment", 1998. **Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.3.4 Gosselin, S.D., "The Application of Fire Dynamics to Fire Forensics", 1998.

6.3.5 Jacoby, D.J., "Ignition Characteristics of Marine Cored Composites: Effect of Skin Thickness and Core Composition", 1998. **Peer-Reviewed Journal Article, see Item 9 below.**

6.3.6 Laramee, S.T., "Performance Based Approach for Analysis and Evaluation of Aircraft Hangers and Similar High Ceiling Spaces", 1999.

6.3.7 Wolski, A., "Addressing Building Fire Safety as an Acceptable Risk-Problem. A Guide for Developing Performance-Based Fire Safety Regulations", 1999. **Peer-Reviewed Journal Article, see Item 9 below. Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.3.8 Wright, M.T., "Flame Spread on Composite Materials for Use in High Speed Craft", 1999. (Major Advisor: Prof. Barnett). **Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.3.9 Gagnon, B., "New Methods for Evaluating the Thermal Performance of Protective Clothing for Fire Fighters", 2000. **Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.3.10 Demmons, N.R., "Enhanced Stability of Lean, Premixed Flames by Flameholder Heating", 2001. (Major Advisor: Prof. Hermanson, ME).

6.3.11 Usowicz, J.E., "An Experimental Study of Flame Lengths and Emissions of Fully-Modulated Diffusion Flames", 2001. (Major Advisor: Prof. Hermanson, ME).

6.3.12 Lautenberger, C.W.,"CFD Simulation of Soot Formation and Flame Radiation", 2002. **Peer-Reviewed Journal Article, see Item 9 below.**

6.3.13 Alston, J.J., "Room/Corner Fire Calibration Data: Marine Composite Screening Specimens", 2004. **Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.3.14 Gratkowski, M., "Radiant Smoldering Ignition of Plywood", 2004. **Peer-Reviewed Journal Article, see Item 9 below.**

6.3.15 Lynch, J.A., "A Study of Smoke Aging Examing Changes in Smoke Particulate Size", 2004.

6.3.16 Zhao, L., "Bench Scale Apparatus Measurement Uncertainty and Uncertainty Effects on Measurement of Fire Characteristics of Materials", 2005. **Peer-Reviewed Journal Article, see Item 9 below. Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.3.17 Kim, Mihyun, "A Study on Pulsation in the Runehamar Tunnel Fire Tests with Forced Longitudinal Ventilation", 2006. (Major Advisor: Prof. Woycheese). **Peer-Reviewed Journal Article, see Item 9 below.**

6.3.18 Lee, S.H., "Material Property Estimation Method Using a Thermoplastic Pyrolysis Model", 2006.

6.3.19 Kwon, J.W., "Evaluation of FDS V.4: Upward Flame Spread", 2006. **Peer-Reviewed Journal Article, see Item 9 below.**

6.3.20 Barter Avila, M., "The Effect of Resin Type and Glass Content on the Fire Engineering Properties of Typical FRP Composites", 2007. **Peer-Reviewed Journal Article, see Item 9 below. Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.3.21 Crocker, Jeremiah, "Investigation of Sprinkler Sprays on Fire Induced Doorway Flows", 2008. (Major Advisor: Prof. Rangwala) **Peer-Reviewed Journal Article, see Item 9 below.**

6.3.22 Wong, William Chiu-Kit, "CFD Flame Spread Model Validation: Multi-component Data Set Framework", 2012. **Peer-Reviewed Journal Article, see Item 9 below.**

6.3.23 Kim, Jin Kyung, "A Conceptual Framework for Assessing Post-Earthquake Fire Performance of Buildings", 2014. (Major Advisor: Prof. Meacham)

6.3.24 Figueroa, Michael, “Dynamic Analysis of a Light Wood-Framed Structure during Fire Conditions”, 2016. (Major Advisor: Prof. Kim, CEE)

6.4 Dissertations

6.4.1 Pehrson, R., “Prediction of Fire Growth on Furniture Using CFD”, 1999. (Major Advisor: Prof. Barnett).

6.4.2 Lantz, R., "Model Validation in Fire Protection Engineering", 2001. **Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.4.3 Choi, K.R, “3D Thermal Mapping of Cone Calorimeter Specimen and Development of a Heat Flux Mapping Procedure Utilizing an Infrared Camera”, 2005.

6.4.4 Ierardi, J.A., “Characterizing the Entry Resistance of Smoke Detectors”, 2005. (Major Advisor: Prof. Barnett)

6.4.5 Beaulieu, P.A., “Flammability Characteristics at Heat Flux Levels up to 200 kW/m^2 and The Effect of Oxygen on Flame Heat Flux”, 2005. **Peer-Reviewed Journal Article, see Item 9 below. Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.4.6 Sipe, J.E., “A Porous Media Model for Sprinkler Wetting”, 2010. **Peer-Reviewed Journal Article, see Item 9 below. Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.4.7 Alvarez, A., “An Integrated Framework for the Next Generation of Risk-informed Performance-based Design Approach Used in Fire Safety Engineering”, 2012. (Major Advisor: Prof. Meacham) **Peer-Reviewed Journal Article, see Item 9 below.**

6.4.8 Kim, M.H., “Parameter Estimation Methods for Comprehensive Pyrolysis Modeling”, 2014. **Peer-Reviewed Journal Article, see Item 9 below. Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.4.9 Park, H.J., “Development of a Holistic Approach to Integrate Fire Safety Performance with Building Design”, 2014. (Major Advisor: Prof. Meacham) **Peer-Reviewed Journal Article, see Item 9 below. Peer-Reviewed Abstract Conference Paper, see Item 9 below.**

6.4.10 Gorbett, G.E., “Development and Assessment of a Decision Support Framework for Enhancing the Forensic Analysis and Interpretation of Fire Patterns”, 2015. (Major Advisor: Prof. Meacham) **Peer-Reviewed Journal Article, see Item 9 below.**

6.4.11 Hansen, Rickard, "Study of Heat Release Rates of Mining Vehicles in Underground Hard Rock Mines", 2015. **Invited to be Dissertation Defense Opponent at Mälardalen University.** (Major Advisor: Prof. Haukur Ingason)

6.4.12 Ivans, W.J., "A Decision Support Framework for Assessing the Technical Adequacy of Performance-Based Design Approaches to Fire Safety Engineering", 2017. (Major Advisor: Prof. Meacham)

6.4.13 You, Y.G., "Development of a Performance Based (Multi-characteristic) Tool for Wall System Insulation Optimization", 2018.

6.4.14 Langot, J., "Multi-physics Modeling of Aerospace Composites Exposed to Fire", 2020. **Invited to be External Evaluator (Examiner) at Montreal Polytechnic.** (Major Advisor: Prof. Etienne)

6.4.15 Wang, H.G., "An Introduction to Fire Performance Monitoring for Buildings", 2021

7 Independent Studies Conducted at WPI

7.1 ISGs / Directed Research

7.1.1 1996: Flame Spread Modeling, one student. FP521 Fire Dynamics I, one student. Flame Spread Modeling, one student.

7.1.2 1999: Performance-based Codes, one student. Fire Dynamics Videos, one student.

7.1.3 2000: Thermal Evaluation of U.S. Army Fabrics, one student.

7.1.4 2001: Room of Origin Fire Hazards Task Group Project, one student. Cone Calorimeter Hardware Overhaul / Upgrade and DA Software Development, one student. CFD fire model (FDS) Numerical Experiments of Balcony Spill Plume, one student.

7.1.5 2002: Cone Calorimeter Hardware Overhaul / Upgrade and DA Software Development, one student.

7.1.6 2004: Combustion Fire Modeling, one student. Pre-Thesis Work, one student.

7.1.7 2005: Pre-Thesis Work, one student. Self-Heating of Sawdust, one student. Modeling of a Building Smoke Control System, one student. Development of a Fire Model GUI, one student.

7.1.8 2006: Development of Cone Calorimeter Data Acquisition Software, one student.

7.1.9 2007: Pre-Thesis Work, one student.

7.1.10 2008: Development of a 2D version of FDS, one student. Effects of Sprinkler Sprays on Toxic Product Generation and Transport, one student. (Major Advisor: Professor Meacham)

7.1.11 2009: Effects of Sprinkler Sprays on Toxic Product Generation and Transport, one student. (Major Advisor: Professor Meacham) Fire Modeling Curriculum Development, one student.

7.1.12 2010: Fire Modeling Curriculum Development, one student. Pyrolysis Modeling of Thermoplastic Polymers, one student.

7.1.13 2012: FP580T Fire and Materials Distance Learning, one student. Building Natural Ventilation Effects on Fire Smoke Movement, one student.

7.1.14 2013: FP520 Fire Modeling, two students.

7.1.15 2014: Fire Lab Large Hood Calorimeter, one student.

7.1.16 2014: Determining Limitations of Kinetic Models for Pyrolysis Simulation of Fiber Reinforced Polymer Composites, one student.

7.1.17 2015: Fire Lab Large Hood Calorimeter, one student.

7.1.18 2015: Determining Limitations of Kinetic Models for Pyrolysis Simulation of Fiber Reinforced Polymer Composites, two students.

7.1.19 2015: FP520 Fire Modeling, two students.

7.1.20 2016: Pre-Thesis work, one student. Pre-Dissertation work, one student.

7.1.21 2017: Code Evolution of Smoke Management in Massachusetts, one student.

7.1.22 2019: Summary of Formulation of Fire Retardant Polymers

7.1.23 2021: Scenario automation for CONTAN using Genetic Algorithms, one student.

7.2 Visiting Researcher

7.2.1 2012: Rickard Hansen. Project: wood roughness effects on ignition behavior.

7.2.2 2014 - 2016: Mihyun Kim. ORISE Post-Doc: in collaboration with the Natick Soldier Research, Development and Engineering Center (Thomas Godfrey, PhD) conduct fire modeling of fabric flammability tests at various scales. **Peer-Reviewed Conference Paper Full Manuscript, see Item 9 below. Peer-Reviewed Journal Article, see Item 9 below.**

7.2.3 2016 - 2018: Mihyun Kim. Funded grant: in collaboration with the Natick Soldier Research, Development and Engineering Center (Margaret Roylance, PhD) conduct pyrolysis and fire modeling of soft wall and rigid wall shelter materials and their assemblies at various scales.

8 Academic Advising at WPI

8.1 Graduate and Undergraduate Students

8.1.1 1995: 7. 1996: 21. 1997: 35. 1998: 29. 1999: 22. 2000: 36. 2001: 41. 2002: 37. 2003: 31. 2004: 28. 2005: 16. 2006: 12. 2007: 8. 2008: 5. 2009: 3. 2010: 4. 2011: 3. 2012: 2. 2013: 2. 2014: 2. 2015: 12. 2016: 15. 2017: 16. 2018: 12. 2019: 8. 2020: 16.

9 List of Publications

9.1 Student names listed in bold.

9.2 Books

9.2.1 **Wieczorek, C.J.**, and Dembsey, N.A., "Engineering Guide: Predicting 1st and 2nd Degree Skin Burns From Thermal Radiation", Society of Fire Protection Engineers, Bethesda, MD, March (2000).

9.2.2 **Kim, M.H. E.**, and Dembsey, N.A., "Engineering Guide for Estimating Material Pyrolysis Properties for Fire Modeling", published on WPI FPE web page: https://www.wpi.edu/sites/default/files/docs/Departments-Programs/Fire-Protection/WPI-Fire-Report-14-III.pdf

9.3 Book Chapters

9.3.1 **Wieczorek, C.J.**, and Dembsey, N.A., "Effects of Thermal Radiation on People: Predicting 1st and 2nd Degree Skin Burns", SFPE Handbook of Fire Protection Engineering, 5th ed., Springer-Verlag, New York (2015) Chapter 68. [DOI: 10.1007/978-1-4939-2565-0]

9.4 Journal Articles, Peer-Reviewed Full Manuscripts

9.4.1 Williamson, R.B., and Dembsey, N.A., "Advances in Assessment Methods for Fire Safety", *Fire Safety Journal*, 20 (1993) 15-38.

9.4.2 Dembsey, N.A., and Williamson, R.B., "The Effect of Ignition Source Exposure and Specimen Configuration on the Fire Growth Characteristics of a Combustible Interior Finish Material", *Fire Safety Journal*, 21 (1993) 313-330.

9.4.3 Dembsey, N.A., Pagni, P.J., and Williamson, R.B., "Compartment Fire Near-Field Entrainment Measurements", *Fire Safety Journal*, 24 (1995) 383-419.

9.4.4 Dembsey, N.A., Pagni, P.J., and Williamson, R.B., "Compartment Fire Experiments: Comparison with Models", *Fire Safety Journal*, 25:3 (1996) 187-227.

9.4.5 Dembsey, N.A., and Williamson, R.B., "Coupling the Fire Behavior of Contents and Interior Finishes for Performance Fire Codes: Evaluation of a Fire Spread Model", *Journal of Fire Protection Engineering*, 8:3 (1997) 19-32.

9.4.6 **Grenier, A.T.**, Dembsey, N.A., and Barnett, J.R., "Fire Characteristics of Cored Composite Materials for Marine Use", *Fire Safety Journal*, 30:2 (1998) 137-159.

9.4.7 Dembsey, N.A., and **Jacoby, D.J.**, "Evaluation of Common Ignition Models for Use with Marine Cored Composites", *Fire and Materials*, 24 (2000) 91-100.

9.4.8 **Wolski, A.**, Dembsey, N.A., and Meacham, B.J., "Accommodating Perceptions of Risk in Performance-based Building Fire Safety Code Development", *Fire Safety Journal*, 34:3 (2000) 297-310.

9.4.9 **Wieczorek, C.J.**, and Dembsey, N.A., "Human Variability Correction Factors for Use with Simplified Engineering Tools for Predicting Pain and 2nd Degree Skin Burns", *Journal of Fire Protection Engineering*, 11:2 (2001) 88-111.

9.4.10 **Lautenberger, C.W.**, de Ris, J.L., Dembsey, N.A., Barnett, J.R., and Baum, H.R., "A Simplified Model for Soot Formation and Oxidation in CFD Simulation of Non-Premixed Hydrocarbon Flames", *Fire Safety Journal,* 40 (2005) 141-176.

9.4.11 **Gratkowski, M.T.**, Dembsey, N.A., and Beyler, C.L., "Radiant Smoldering Ignition of Plywood", *Fire Safety Journal,* 41:6 (2006).

9.4.12 **Shanmuganathan, K.**, Deodhar, S., Dembsey, N.A., Fan, Q., Calvert, P.D., Warner, S.B., Patra, P.K., "Flame Retardancy and Char Microstructure of Nylon 6/Layered Silicate Nanocomposites" *Journal of Applied Polymer Science,* 104 (2007) 1540-1550. [DOI 10.1002/app.25542]

9.4.13 **Beaulieu. P.A.**, and Dembsey, N.A., "Burning Behavior at High Applied Heat Flux Levels: Implications for Determination of Material Properties", *Composites Research Journal*, 1:3 (2007) on-line at acmanet.org.

9.4.14 Coles, A., Wolski, A., Lautenberger, C.W., and Dembsey, N.A., "Building Code Requirements for Performance Based Designs and Fire Modeling of Composite Materials", *Composites Research Journal*, 1:2 (2007) on-line at acmanet.org.

9.4.15 Book Review: Dembsey, N.A., "*Fundamentals of Fire Phenomena* by James G. Quintiere", *Fire Technology*, 43:1 (2007) 91-92.

9.4.16 **Kwon, J.W.**, Dembsey, N.A., and Lautenberger, C.W., "Evaluation of FDS V.4: Upward Flame Spread", *Fire Technology,* 43:4 (2007) 255-284. [DOI 10.1007/s10694-007-0020-x]

9.4.17 **Avila, M.B**, Dembsey, N.A., and Dore, C.H., "Effect of Resin Type and Glass Content on the Reaction to Fire Characteristics of Typical FRP Composites", *Composites: Part A,* 39:9 (2008) 1503-1511. [DOI: 10.1016/j.compositesa.2008.05.012]

9.4.18 **Avila, M.B.**, Dembsey, N.A., **Kim, M.H.**, Lautenberger, C.W., and Dore, C.H., "Fire Characteristics of Polyester FRP Composites with Different Glass Contents", *Composites Research Journal*, 2:2 (2008) on-line at acmanet.org.

9.4.19 **Zhao, L.**, and Dembsey, N.A., "Measurement Uncertainty Analysis for Calorimetry Apparatuses", *Fire and Materials,* 32:1 (2008) 1-26. [DOI 10.1002/fam.947]

9.4.20 **Beaulieu, P.A.**, and Dembsey, N.A., "Flammability Characteristics at Applied Heat Flux Levels up to 200 kW/m^2", *Fire and Materials,* 32:2 (2008) 61-86. [DOI 10.1002/fam.948]

9.4.21 **Beaulieu, P.A.**, and Dembsey, N.A., "Effect of Oxygen on Flame Heat Flux in Horizontal and Vertical Orientations", *Fire Safety Journal,* 43:6 (2008) 410-428. [DOI 10.1016/j.firesaf.2007.11.008]

9.4.22 **Kim, M.H.**, Woycheese, J.P., and Dembsey, N.A., "Fire Dynamics Simulator (Version 4.0) Simulation for Tunnel Fire Scenarios with Forced, Transient, Longitudinal Ventilation Flows", *Fire Technology,* 44:2 (2008) 137-166. [DOI 10.1007/s10694-007-0028-2]

9.4.23 **Shanmuganathan, K.**, Deodhar, S., Dembsey, N.A., Fan, Q., and Patra, P.K., "Condensed Phase Flame Retardation in Nylon 6-layered Silicate Nanocomposites: Films, Fibers and Fabrics", *Polymer Engineering and Science,* 48:4 (2008) 662-675. [DOI 10.1002/pen.20993]

9.4.24 **Park, H.J.**, Rangwala, A.S., and Dembsey, N.A., "A Means to Estimate Thermal and Kinetic Parameters of Coal Dust Layer from Hot Surface Ignition Tests", *Journal of Hazardous Materials,* 168:1 (2009) 145-155. [DOI: 10.1016/j.jhazmat.2009.02.010]

9.4.25 **Crocker, J.P.**, Rangwala, A.S., Dembsey, N.A., and LeBlanc, D.J., "Investigation of Sprinkler Sprays on Fire Induced Doorway Flows", *Fire Technology*, 46:2 (2010) 347-362. [DOI: 10.1007/s10694-009-0081-0]

9.4.26 Deodhar, S., **Shanmuganathan, K.**, Fan, Q., Wilkie, C.A., Costache, M.C., Dembsey, N.A., Patra, P.K., "Calcium Carbonate and Ammonium Polyphosphate Based Flame Retardant Composition for Polypropylene", *Journal of Applied Polymer Science*, 120:3 (2011) 1866-1873. [DOI: 10.1002/app.32510]

9.4.27 Meacham, B.J., Dembsey, N.A., **Schebel, K.**, Johann, M.A., and Tubbs, J.S., "Use of Small-scale Test Data to Enhance Fire-Related Threat, Vulnerability, Consequence and Risk Assessment for Passenger Rail Vehicles", *Journal of Homeland Security and Emergency Management*, 9:1 (2012) Article 1. [http://www.bepress.com/jhsem/vol9/iss1/1]

9.4.28 Meacham, B.J., Dembsey, N.A., Johann, M.A., Tubbs, J.S., and **Schebel, K.**, "A Simplified Approach for Assessing Initial Fire Development and Spread in Passenger Rail Vehicles", *Transportation Research Record: Journal of the Transportation Research Board,* 2261 (2011) 57-63. [DOI 10.3141/2261-07]

9.4.29 **Schebel, K.,** Meacham, B.J., Dembsey, N.A., Johann, M., Tubbs, J., and Alston, J.J., "Fire Growth Simulation in Passenger Rail Vehicles Using a Simplified Flame Spread Model for integration with CFD Analysis", *Journal of Fire Protection Engineering*, 22:3 (2012) 197-225. [DOI: 10.1177/1042391512448303]

9.4.30 **Wong, W.C.K.**, Dembsey, N.A., Alston, J., and Lautenberger, C., "A Multi-component Dataset Framework for Validation of CFD Flame Spread Models", *Journal of Fire Protection Engineering*, 23: 2 (2013) 85-134. [DOI: 10.1177/1042391512472087] **SFPE's 2014 Jack Bono Award. Best JFPE paper for 2013.**

9.4.31 **Sipe, J.E.**, and Dembsey, N.A., "A Porous Media Model for Sprinkler Wetting: Ceramic Fiberboard Validation", *Fire Safety Journal*, 58 (2013) 213-220. [DOI: 10.1016/j.firesaf.2013.02.003]

9.4.32 **Alvarez, A.**, Meacham, B.J., Dembsey, N.A., and Thomas, J.R., "Twenty Years of Performance-based Fir Protection Design: Challenges Faced and a Look Ahead", *Journal of Fire Protection Engineering*, 23:4 (2013) 249-276. [DOI: 10.1177/1042391513484911]

9.4.33 **Alvarez, A.**, Meacham, B.J., Dembsey, N.A., and Thomas, J.R., "A Framework for Risk-informed Performance-based Fir Protection Design for the Built Environment", *Fire Technology*, 50:2 (2014). [DOI: 10.1007/s10694-013-0366-1]

9.4.34 **Park, H.J.**, Meacham, B.J., Dembsey, N.A., and Goulthorpe, M., "Enhancing Building Fire Safety Performance by Reducing Miscommunication and Misconceptions", *Fire Technology*, 50:2 (2014). [DOI: 10.1007/s10694-013-0365-2]

9.4.35 Berardi, U., Meacham, B.J., Dembsey, N.A., and **You, Y.G.**, "Fire Performance Assessment of a Fiber Reinforced Polymer Wall Panel Used in a Single Family Dwelling", submitted to *Fire Technology*, 50:6 (2014). [DOI: 10.1007/s10694-014-0403-8]

9.4.36 **Park, H.J.**, Meacham, B.J., Dembsey, N.A., and Goulthorpe, M., "Integration of Fire Safety and Building Design", *Building Research & Information*, 42:6 (2014). [DOI: 10.1080/09613218.2014.913452]

9.4.37 **Park, H.J.**, Meacham, B.J., Dembsey, N.A., and Goulthorpe, M., "Conceptual Model Development for Holistic Building Fire Safety Performance Analysis", *Fire Technology*, 51:1 (2015) 173-193. [DOI: 10.1007/s10694-013-0374-1]

9.4.38 **You, Y.G.**, **Park, H.J.**, Dembsey, N.A., Till Jr., W.B., Johnson, E.R., and Butler, J., "Characteristics of Nuclear Facility Waste Bag Fires", *Fire Technology*, 51:1(2015) 129-152. [DOI: 10.1007/s10694-013-0368-z]

9.4.39 **Kim, E.**, and Dembsey, N.A.,"Parameter Estimation for Comprehensive Pyrolysis Modeling: Guidance and Critical Observations", *Fire Technology*, 51:2 (2015) 443-477. [DOI: 10.1007/s10694-014-0399-0]

9.4.40 **Kim, E.**, Dembsey, N.A., and Shivkumar, S., "Evaluating Effects of Applying Different Kinetic Models to Pyrolysis Modeling of Fiberglass Reinforced Polymer Composites", *Fire and Materials*, 39:2 (2015). [DOI: 10.1002/fam.2239]

9.4.41 **Kim, E.**, and Dembsey, N.A., "Evaluation of Pyrolysis Parameters for Fiberglass Reinforced Polymer Composites Based on Multi-objective Optimization", *Fire and Materials*, 39:8 (2015) 717-731. [DOI: 10.1002/fam.2262]

9.4.42 **Gorbett, G.**, Meacham, B.J., Wood, C.B., and Dembsey, N.A., "Structure and Evaluation of the Process for Origin Determination in Compartment Fires", *Fire Technology*, 53:1(2017) 301-329. [DOI: 10.1007/s10694-015-0553-3]

9.4.43 **Gorbett, G.**, Meacham, B.J., Wood, C.B., and Dembsey, N.A., "Use of Damage in Fire Investigation: A Review of Fire Patterns Analysis, research and future Direction", *Fire Science Reviews*, 4:4 (2015). [DOI: 10.1186/s40038-015-0008-4]

9.4.44 Berardi, U., and Dembsey, N.A., "Thermal and Fire Characteristics of FRP Composites for Architectural Applications", *Polymers*, 7 (2015) 2276-2289. [DOI: 10.3390/polym7111513]

9.4.45 Kim, E., Dembsey, N.A., Godfrey, T., and Roylance, M., "Numerical Modeling of Fabric Vertical Flame Testing: Textile Samples", *Journal of Fire Sciences*, 34:6 (2016) 468-489. [DOI: 10.1177/0734904116667634]

9.4.46 Dembsey, N.A., **Brokaw, F.M.**, Stapleton, H.M., Dodson, R.E., Onasch, J., Jazan, E., and Carignan, C.C., "Intervention to Reduce Gymnast Exposure to Flame Retardants from Pit Foam: A Case Study", *Environment International*, 127 (June 2019) 868-875. [DOI: 10.1016/j.envint.2019.01.084]

9.4.47 Hansen, R., and Dembsey, N., "The Influence of Fuel Surface Roughness and Surface Structures on Ignition in the Mining Industry – An Exploratory Analysis", *International Journal of Mining, Materials and Metallurgical Engineering*, 6 (2020) 1-17. [DOI: 10.11159/ijmmme.2020.001]

9.4.48 Wang, H., Dembsey, N.A., Meacham, B.J., Liu, S., and Simeoni, A. "Comparison of Sensitivity Matrix Method, Power Function-based Response Surface Method, and Artificial Neural Network in the Analysis of Building Fire Egress Performance", *Journal of Building Engineering*, 43 (2021). [DOI: 10.1016/j.jobe.2021.102860]

9.5 Journal Articles, Peer-Reviewed Abstracts

9.5.1 Patra, P.K., **Huo, Y.**, Fan, Q., and Dembsey, N., "Influence of Polyborosiloxane on the Flame Retardancy of Polyethylene Terephthalate-clay Nanocomposite," PMSE Preprints, 96 (2007) 528-530.

9.6 Journal Articles, Not Peer-Reviewed

9.6.1 None.

9.7 Conference Papers, Peer-Reviewed Full Manuscripts

9.7.1 **Alston, J.J.** and Dembsey, N.A., "Evaluation of Dimensionless Flame Height Parameters to Account for Fuel Source Effects", in *Fire Safety Science - Proceedings of the 7th International Symposium*, International Association for Fire Safety Science, London, UK (2002).

9.7.2 Patra, P.K., **Shanmuganathan, K.**, Razdan, S., Fan, Q., Kim, Y.K., Warner, S.B., Calvet, P.D., and Dembsey, N.A., "Fire Retardancy and Morphology of Nylon 6-Clay Nanocomposite Compositions", in *Degradation Processes in Nanostructured Materials*, MRS Proceedings Volume 887, Materials Research Society, Warrendale, PA, USA (2006).

9.7.3 Lautenberger, C.W., **Kim, M.H.**, Dembsey, N.A., Fernandez-Pello, C., "The Role of Decomposition Kinetics in Pyrolysis Modeling: Application to a Fire Retardant Polyester Composite", in *Fire Safety Science - Proceedings of the 9th International Symposium*, International Association for Fire Safety Science, London, UK (2008) 1201-1212. [DOI:10.3801/IAFSS.FSS.9-1201] **Honorable Mention for Best Paper.**

9.7.4 Meacham, B.J., Dembsey, N.A., Johann, M.A., Tubbs, J.S., and **Schebel, K.**, "A Simplified Approach for Assessing Initial Fire Development and Spread in Passenger Rail Vehicles", in *Proceedings of Transportation Research Board 90th Annual Meeting, TRB 2011*, Transportation Research Board of the National Academies, Marriott Wardman Park, Omni Shoreham and Washington Hilton Hotels, Washington, DC, USA, 23-27 January (2011). Paper 11-1513.

9.7.5 Tubbs, J., Alston, J.J., Johann, M., Meacham, B.J., Dembsey, N.A., **Schebel, K.**, "A New Approach to Determining Passenger Rail Vehicle Design Fires", in *Proceeding of 2012 ASHRAE Winter Conference*, ASHRAE, Palmer House Hilton, Chicago, Il, USA, 21-25 January (2012).

9.7.6 **Kim, E.**, Dembsey, N.A., and Shivkumar, S., "Kinetic Modeling Effects on Pyrolysis Modeling of Fiberglass Reinforced Polymer Composites", in *Proceedings of the Seventh International Seminar on Fire & Explosion Hazards (ISFEH7)*, Renaissance Hotel, Providence, RI, USA, 5-10 May (2013).

9.7.7 Kim, E., Dembsey, N.A., Godfrey, T., "Parametric Study of Fabric Characteristics' Effect on Vertical Flame Test Performance Using Numerical Modeling", in *Proceedings of the Tenth Symposium on Performance of Protective Clothing and Equipment: Risk Reduction Through Research and Testing, ASTM STP 1593*, San Antonio, TX, USA, 28-29 January (2016).

9.8 Conference Papers, Peer-Reviewed Abstracts

9.8.1 **Anderson, S.K.** and Dembsey, N.A., " A Qualitative Study of the Effect of a Compartment Enclosure on Fire Plume Entrainment", in *Proceedings of the 2nd International Conference on Fire Research and Engineering*, National Institutes of Standards and Technology, Gaithersburg, MD, USA, 10-15 August (1997).

9.8.2 **Wolski, A.**, Dembsey, N.A., and Meacham, B.J., "Application of Acceptable Risk Principles to the Development of Performanced Based Building Fire Safety Regulation", in *Proceedings of 2nd International Conference on Performance-Based Codes and Fire Safety Design Methods*, Maui Marriott, Lahaina, Maui, Hawaii, USA, 7-9 May (1998).

9.8.3 **Lantz, R.V.**, Dembsey, N.A., and Barnett, J.R., "An Argument for Information Theory as a Strategy for Model Validation", in *Proceedings of SFPE Symposium on Risk, Uncertainty, and Reliability in Fire Protection Engineering*, Omni Inner Harbor Hotel, Baltimore, MD, USA, 12-14 May (1999).

9.8.4 **Wolski, A.**, Dembsey, N.A., and Meacham, B.J., "Accommodating Perceptions of Risk in Performance-based Building Fire Safety Code Development", in *Proceedings of Interflam'99, 8th International Fire Science & Engineering Conference*, Edinburgh Conference Centre, Edinburgh, Scotland, UK, 29 June-1 July (1999).

9.8.5 **Wright, M.**, Barnett, J.R., and Dembsey, N.A., "Flame Spread on Cored Composite Panels for Use in High Speed Craft", in *Proceedings of 3rd International Conference on Fire Research and Engineering*, Ramada Congress Hotel, Chicago, IL, USA, 4-8 October (1999).

9.8.6 **Lantz, R.V.**, Dembsey, N.A. and Barnett, J.R., "Model Validity Defined and Applied to the Problem of Making Legitimate Predictions for Fire Protection Engineering Models", in *Proceedings of 3rd International Conference on Performance-Based Codes and Fire Safety Design Methods*, Lund University, Lund, Sweden, 15-17 June (2000).

9.8.7 **Gagnon, B.**, Dembsey, N.A., and Keltner, N., "Preliminary Results from New Methods for Evaluation of Fire Fighting Clothing", in *Proceedings of Fire and Materials 2001, 7th International Conference and Exhibition*, Sheraton Fisherman's Wharf Hotel, San Francisco, CA, USA, 22-24 January (2001).

9.8.8 **Alston, J.J.**, Dembsey, N.A., and Barnett, J.R., "Compartment Fire Dynamics Model Calibration Data: Marine Composite Screening Specimens", in *Proceedings of Interflam2001, 9th International Fire Science and Engineering Conference*, Edinburgh Conference Centre, Edinburgh, Scotland, 17-19 September (2001).

9.8.9 Dore, C.H., Dembsey, N.A., Lee, C.M. and Qureshi, S.P., "Fire Growth Evaluation and Mechanical Properties of Seven Thermoset Composites", in *Proceedings of 23rd SAMPE Europe International Conference*, Paris Expo, Porte de Versailles, Paris, France, 9-11 April (2002).

9.8.10 **Alston, J.J.**, and Dembsey, N.A., "Marine Composite Material Fire Properties: Implications of Uncertainty", in *Proceedings of SAMPE 2002*, Long Beach Convention Center, Long Beach, CA, USA, 12-16 May (2002).

9.8.11 Dembsey, N.A., Lee, C.M. and Qureshi, S.P., "Fire Growth Evaluation and Mechanical Properties of Seven Thermoset Composites", in *Proceedings of SAMPE 2002*, Long Beach Convention Center, Long Beach, CA, USA, 12-16 May (2002). **Outstanding Paper Award at SAMPE 2002 - 2nd Place.**

9.8.12 Dembsey, N.A., Lee, C.M. and Qureshi, S.P., "Fire Growth Evaluation and Mechanical Properties of Seven Thermoset Composites", in *Proceedings of TAPPI 2002 Decorative & Industrial Laminates Symposium*, Omni Hotel at CNN Center, Atlanta, GA, USA, 19-21 August (2002).

9.8.13 **Alston, J.J.**, and Dembsey, N.A., "Marine Composite Material Fire Properties: Implications of Uncertainty", in *Proceedings of Fire and Materials 2003, 8th International Conference*, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 27-28 January (2003).

9.8.14 **Beaulieu. P.A.**, Dembsey, N.A. and Alpert, R.L., "A New Material Flammability Apparatus and Measurement Techniques", in *Proceedings of SAMPE 2003*, Long Beach Convention Center, Long Beach, CA, USA, 11-15 May (2003).

9.8.15 **Beaulieu. P.A.**, Dembsey, N.A. and Alpert, R.L., "A New Material Flammability Apparatus and Measurement Techniques", in *Proceedings of Composites 2003*, Anaheim Convention Center, Anaheim, CA, USA, 1-3 October (2003).

9.8.16 **Beaulieu. P.A.**, Dembsey, N.A. and Alpert, R.L., "Flammability Characteristics at Applied Heat Flux Levels up to 220 kW/m^2: Time to Ignition, Mass Loss Flux and Thermal Properties", in *Proceedings of Interflam2004, 10th International Fire Science and Engineering Conference*, Edinburgh Conference Centre, Edinburgh, Scotland, 5-7 July (2004).

9.8.17 **Zhao, L.** and Dembsey, N.A., "Uncertainty Effects on Measurement of Fire Characteristics of Material Systems", in *Proceedings of Composites 2004*, Tampa Convention Center, Tampa, FL, USA, 6-8 October (2004).

9.8.18 **Beaulieu, P.A.**, Dembsey, N.A. and Bill, R.G., "Flammability Characteristics at Applied Heat Flux Levels up to 220 kW/m^2: Time to Ignition, Mass Loss Flux and Thermal Properties", in *Proceedings of Composites 2004*, Tampa Convention Center, Tampa, FL, USA, 6-8 October (2004).

9.8.19 **Zhao, L.** and Dembsey, N.A., "Uncertainty Effects on Measurement of Fire Characteristics of Material Systems", in *Proceedings of Fire and Materials 2005, 9th International Conference*, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 31 January – 1 February (2005).

9.8.20 **Beaulieu, P.A.** and Dembsey, N.A., "Enhanced Equations for Oxygen and Carbon Dioxide Calorimetry", in *Proceedings of Fire and Materials 2005, 9th International Conference*, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 31 January – 1 February (2005).

9.8.21 **Beaulieu, P.A.**, Dembsey, N.A. and Bill, R.G., "Use of Enhanced Oxygen in Small Scale Vertical Flame Spread", in *Proceedings of Composites 2005*, Greater Columbus Convention Center, Columbus, OH, USA, 28-30 September (2005).

9.8.22 **Zhao, L.** and Dembsey, N.A., "Measurement Uncertainty Analysis for Fire Calorimetry Apparatuses", in *Proceedings of Composites 2005*, Greater Columbus Convention Center, Columbus, OH, USA, 28-30 September (2005).

9.8.23 **Beaulieu, P.A.**, Dembsey, N.A. and Bill, R.G., "Ignition and Burning Behavior at High Heating Rates (Applied Heat Flux Levels), in *Proceedings of 2006 NATAS Conference*, North American Thermal Analysis Society 34th Annual Conference, Holiday Inn University Plaza Hotel, Bowling Green, KY, USA, 6-9 August (2006).

9.8.24 **Beaulieu, P.A.**, Dembsey, N.A. and Bill, R.G., "Burning Behavior at High Applied Heat Flux Levels: Implications for Determination of Material Properties", in *Proceedings of Composites 2006*, America's Center, St Louis, MO, USA, 18-20 October (2006).

9.8.25 **Avila, M.B.**, Dembsey, N.A. and Dore, C.H., "Effect of Resin Type and Glass Content on Fire Engineering Properties of FRP Composites", in *Proceedings of Composites 2006*, America's Center, St Louis, MO, USA, 18-20 October (2006).

9.8.26 Coles, A., Wolski, A., Lautenberger, C.W., and Dembsey, N.A., "Building Code Requirements for Performance Based Designs and Fire Modeling", in *Proceedings of Composites 2006*, America's Center, St Louis, MO, USA, 18-20 October (2006).

9.8.27 **Beaulieu, P.A.,** and Dembsey, N.A., "Burning Behavior at High Applied Heat Flux Levels and Flame Heat Flux in Enhanced Ambient Oxygen", in *Proceedings of Fire and Materials 2007, 10th International Conference*, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 29-31 January (2007).

9.8.28 **Avila, M.B.**, Dembsey, N.A., and Dore C.H., "Effect of Resin Type and Glass Content on the Fire Engineering Properties of Typical FRP Composites", in *Proceedings of Fire and Materials 2007, 10th International Conference*, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 29-31 January (2007).

9.8.29 Rangwala, A.S., Buckley, S.G., Dembsey, N.A., and Torero, J.L., "The Relationship Between Gas-Phase Standoff Distance and the Solid-Phase", in *Proceedings of 5th International Seminar on Fire and Explosion Hazards*, University of Edinburgh, Scotland, UK, April (2007).

9.8.30 **Kim, M.H.**, Woycheese, J.P., and Dembsey, N.A., "Sensitivity Analysis of Fire Dynamics Simulator Version 4.0 for Tunnel Fire Scenarios with Forced Longitudinal Ventilation", in *Proceedings of Interflam2007, 11th International Fire Science and Engineering Conference*, University of London, Royal Holloway College, London, UK, 3-5 September (2007).

9.8.31 **Huo, Yue**, Fan, Qinguo, Dembsey, N.A., and Patra, P.K., "Influence of Polyborosiloxane on the Flame Retardancy of Polyethylene Terephthalate-clay Nanocomposite", in *Proceedings of 2007 MRS Spring Meeting*, Moscone West, San Francisco, CA, USA, 9-13 April (2007).

9.8.32 **Avila, M.B.**, Dembsey, N.A., Kim, M.H., Lautenberger, C.W., and Dore, C.H., "Fire Characteristics of Polyester FRP Composites with Different Glass Contents", in *Proceedings of Composites & Polycon 2007*, Tampa Convention Center, Tampa, FL, USA, 17-19 October (2007). **Best Overall Technical Paper Award at *Composites & Polycon 2007*.**

9.8.33 **Kim, M.H.**, Lautenberger, C.W., and Dembsey, N.A., "Property Estimation for Pyrolysis Modeling Applied to Polyester FRP Composites with Different Glass Contents", in *Proceedings of Composites & Polycon 2009*, American Composites Manufacturers Association, Tampa Convention Center, Tampa, FL, USA, 15-17 January (2009).

9.8.34 Beaulieu, P.A., Dembsey, N.A., Dore, C., Park, H.J., "Experimental Results on The Intermediate Scale Fire Spread Characteristics of Typical FRP Composites", in *Proceedings of Composites & Polycon 2009*, American Composites Manufacturers Association, Tampa Convention Center, Tampa, FL, USA, 15-17 January (2009). **Best Fire Technical Paper Award at *Composites and Polycon 2009.***

9.8.35 **Kim, M.H.**, Lautenberger, C.W., and Dembsey, N.A., "Property Estimation for Pyrolysis Modeling Applied to Polyester FRP Composites with Different Glass Contents", in *Proceedings of Fire and Materials 2009, 11th International Conference*, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 26-28 January (2009).

9.8.36 Lautenberger, C.W., **Wong, W.**, Coles, A., Dembsey, N.A., Fernandez-Pello, C., "Large-Scale Turbulent Flame Spread Modeling with FDS5 on Charring and Noncharring Materials", in *Proceedings of Fire and Materials 2009, 11th International Conference*, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 26-28 January (2009).

9.8.37 **Kim, M.H.**, Dembsey, N.A., and Dore, C.H., "Property Estimation for Pyrolysis Modeling Applied to Flame Retarded Modified Acrylic FRP Composites", in *Proceedings of Composites & Polycon 2010*, American Composites Manufacturers Association, Mandalay Bay, Las Vegas, NV, USA, 9-11 February (2010). **Best Fire Technical Paper Award at *Composites and Polycon 2010.***

9.8.38 **Sipe, J.E.**, and Dembsey, N.A., "A Porous Media Model for Fire Sprinkler Wetting", in *Proceedings of Interflam 2010, 12th International Conference on Fire Science and Engineering*, Interscience Communications, East Midlands Conference Centre, University of Nottingham, UK, 5-7 July (2010).

9.8.39 **Kim, M.H.**, Shivkumar, S., and Dembsey, N.A., "Thermal Degradation Kinetics Modeling for Pyrolysis Modeling Using Fire Retarded Thermoset Ploymer Resins", in *Proceedings of Interflam 2010, 12th International Conference on Fire Science and Engineering*, Interscience Communications, East Midlands Conference Centre, University of Nottingham, UK, 5-7 July (2010).

9.8.40 **Accosta, R.**, Magnone, Z., Crocker, J., Xiao, B., Dembsey, N.A., and Meacham, B.J., "Transport of Toxic Products – Comparison of Experimental and Numerical Results Part One: Non-Sprinklered Scenarios", in *Proceedings of Interflam 2010, 12th International Conference on Fire Science and Engineering*, Interscience Communications, East Midlands Conference Centre, University of Nottingham, UK, 5-7 July (2010).

9.8.41 Lautenberger, C.W., **Wong, W.C.**, Coles, A., Dembsey, N.A., and Fernandez-Pello, C., "Comprehensive Data Set for Validation of Fire Growth Models: Experiments and Modeling", in *Proceedings of Interflam 2010, 12th International Conference on Fire Science and Engineering*, Interscience Communications, East Midlands Conference Centre, University of Nottingham, UK, 5-7 July (2010).

9.8.42 Lautenberger, C.W., **Wong, W.C.**, Coles, A., Dembsey, N.A., and Fernandez-Pello, C., "Comprehensive Data Set for Validation of Fire Growth Models: Experiments and Modeling", in *Proceedings of International Congress on Combustion and Fire Dynamimcs*, University of Cantabria, Santander, Spain, 20-23 October (2010).

9.8.43 **Kim, M.H.**, and Dembsey, N.A., "Evaluation of Different Approaches for Property Estimation for Pyrolysis Modeling Applied to FRP Composites", in *Proceedings of Composites 2011, The Composites Exhibition and Convention*, American Composites Manufacturers Association, Broward County Convention Center, Ft. Lauderdale, FL, USA, 2-4 February (2011).

9.8.44 **Kim, M.H.**, and Dembsey, N.A., "Evaluation of Different Approaches for Property Estimation for Pyrolysis Modeling Applied to FRP Composites", in *Proceedings of Fire and Materials 2011, 12th International Conference*, Interscience Communications, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 31 January – 2 February (2011).

9.8.45 **Sipe, J.E.**, and Dembsey, N.A., "A Porous Media Model for Fire Sprinkler Wetting", in *Proceedings of Fire and Materials 2011, 12th International Conference*, Interscience Communications, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 31 January – 2 February (2011).

9.8.46 Magnone, Z., **Adams, V.**, Han, Z., **Southard, S.**, Su, C., Dembsey, N.A., Morgan, J., and Beaulieu, P., "Sprinkler Spray Effects on Combustion Products Leaving a Compartment", in *Proceedings of Suppression, Detection and Signaling Research and Applications, a Technical Working Conference, SUPDET 2011*, NFPA, International Plaza Resort and Spa, Orlando, FL, 22-25 March (2011).

9.8.47 Avila, M., Hao, B., **Fast, N.,** Magnone, Z., **Winsten, R.,** Chu, Y., and Dembsey, N.A., "Droplet Characterization Using Direct Imaging Techniques", in *Proceedings of Suppression, Detection and Signaling Research and Applications, a Technical Working Conference, SUPDET 2012*, NFPA, Sheraton Crescent Hotel, Phoenix, AZ, 5-8 March (2012).

9.8.48 **Park, H.J.,** Meacham, B.J., and Dembsey, N.A., "Increasing Building Fire Safety by Bridging the Gap between Architects and Fire Safety Engineers", in *Proceedings of 9th International Conference on Performance-Based Codes and Fire Safety Design Methods*, SFPE, The Excelsior Hong Kong, Causeway Bay, Hong Kong, 20-22 June (2012).

9.8.49 Dembsey, N.A., Stevens, M., Kreysler, W., and **You, Y.G.**, "Exterior Wall Assembly Material Screening Process for NFPA 285", in *Proceedings of Composites 2013, The Premier Exhibition and Convention*, American Composites Manufacturers Association, Orange County Convention Center, Orlando, FL, USA, 29-31 January February (2013). **Best Materials Technical Paper Award at *Composites 2013.***

9.8.50 **Kim, E.**, Dembsey, N.A., and Shivkumar, S., "Thermo-Physical and Optical Parameter Estimation for Pyrolysis Modeling of Fiberglass Reinforced Polymer Composites", in *Proceedings of ANTEC 2013*, Society of Plastics Engineers, Duke Energy Convention Center, Cincinnati, Ohio, USA, 22-24 April (2013).

9.8.51 Dembsey, N.A., Kreysler, W., **Anaya, J., Herrera, R.C., and Morgan, D.**, "FRP Resin and Additive Effects on Fire Performance for Quality Control Planning", in *Proceedings of CAMX 2014, the Composites and Advanced Materials Expo*, American Composites Manufacturers Association, Orange County Convention Center, Orlando, FL, USA, 13-16 October (2014).

9.8.52 **Park, H.J.**, Meacham, B.J., Dembsey, N.A., and Goulthorpe, M., "Conceptual Model Development to Integrate Fire Safety Performance with Building Design", in *Proceedings of the 10th International Conference on Performance-based Codes and Fire Safety Design*, Society of Fire Protection Engineers, University of Queensland, Brisbane, Australia, 12-14 November (2014).

9.8.53 **You, Y.G., Yin, M., Marin, D.,** Meacham, B., Dembsey, N., Gollner, M., Marshall, A., Maisto, P., Ahrens, M., Grant, C., and Rodrigue, T., , "Quantification of Green Building Features on Firefighter Safety: Problem Definition, Data Collection, Preliminary Analysis and Experimental Plan", in *Proceedings of the 10th International Conference on Performance-based Codes and Fire Safety Design*, Society of Fire Protection Engineers, University of Queensland, Brisbane, Australia, 12-14 November (2014).

9.8.54 **Kim, M.H.**, Godfrey, T. and Dembsey, N.A., "Numerical Modeling of Vertical Flame Testing of Nylon-Cotton and Flame Resistant Fabrics Used in Army Combat Uniforms", in *Proceedings of Fire and Materials 2015, 14th International Conference*, Interscience Communications, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 2-4 February (2015).

9.8.55 Dembsey, N.A., **Gillespie, B., Long, M., McMillan, N., Walde, C.**, and Kreysler, W., "Pyrolysis Simulation of Fiber Reinforced Polymer (FRP) Composites: Challenges of Zero-Dimensional Testing of Resin and Additive Mixtures to Measure Kinetic Parameters", in *Proceedings of Fire and Materials 2015, 14th International Conference*, Interscience Communications, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 2-4 February (2015).

9.8.56 Dembsey, N.A., Kreysler, W., and **Anderson, K.**, "Simulation of Micro-scale Fiber Reinforced Polymer Resin and Additive Specimens for Kinetic Modeling", in *Proceedings of CAMX 2015, The Composites and Advanced Materials Expo*, American Composites Manufacturers Association, Dallas, TX, USA, 26-29 October (2015).

9.8.57 Dembsey, N.A., Kreysler, W., and **Anderson, K.**, "Simulation of Micro-scale Fiber Reinforced Polymer Resin and Additive Specimens for Kinetic Modeling", in *Proceedings of Fire and Materials 2017, 15th International Conference*, Interscience Communications, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 6-8 February (2017).

9.8.58 Hashempour, J., Ranellone, R., Simeoni, S., and Dembsey, N.A., "Designing a Gas Sampling System for a 3 MW Fire Calorimeter Using an Experimental Approach", in *Proceedings Spring Technical Meeting of Eastern States Section of the Combustion Institute*, Combustion Institute, State College, Pennsylvania, USA, 4-7 March (2018).

9.8.59 Hansen, R., and Dembsey, N., "The Influence of Fuel Surface Roughness on Ignition in the Mining Industry", in *Proceedings of the 5th World Congress on Mechanical, Chemical and Material Engineering (MCM'19)*, Paper No. MMME 102, Lisbon, Portugal, August (2019). [DOI: 10.11159/mmme19.102]

9.9 Conference Papers, Not Peer-Reviewed

9.9.1 None.

9.10 Other Publications, Not Peer-Reviewed

9.10.1 Dembsey, N.A., **Choi, K.R.**, and **Lyles, L.**, "Quantitative Methods for Skin Burn Simulation", draft report for *Society of Fire Protection Engineers Task Group on Engineering Practices* (1997).

9.10.2 **Haagensen, D.**, Clougherty, E.V., and Dembsey, N.A., "New Methods for Evaluating the Thermal Performance of Protective Clothing for Fire Fighters", WPI final report for K-Tech Corp. project entitled "New Methods for Evaluating the Thermal Performance of Protective Clothing for Fire Fighters", DOC-SBIR (1997).

9.10.3 Dembsey, N.A., and **LeBlanc, D.J.**, "An Assessment of Flow Patterns Over and Heat Transfer to a Thermographic Phosphor Based Heat Flux Sensor", WPI final report for K-Tech Corp. project entitled "Thermographic Phosphor Based Heat Flux Sensors", DOC-SBIR (1997).

9.10.4 **Lautenberger, C.W.**, Dembsey, N.A., and Barnett, J.R., "Hughes/USCG TO0013 Report: Evaluation of a Zone Model Flame Spread Algorithm Against Corner Test Data", submitted to Hughes Associates Inc., Baltimore, MD (1999). Issued as part of "Prediction of ISO 9705 Room/Corner Test Results", R+DC-215-99, USDOT, USCG, Marine Safety and Environmental, G-MSE-4, Washington, DC, USA, (1999).

9.10.5 **Lynch, J.A.**, and Dembsey, N.A., "Thermal Properties Evaluation for Protective Clothing Fabrics", WPI final report for U.S. Army Soldier and Biological Chemical Command, Soldier Systems Center, Natick, MA, USA, DAAD16-00-P-0596 (2001).

9.10.6 Dembsey, N.A., **Alston, J.A.** and **Ayers, S.D.**, "Using Cone Calorimeter Data and Half-Scale Corner Test Data to Assess the Fire Performance of Composite Materials", submitted to Cinnabar-Florida, Orlando, FL, USA as part of the project *Phenolics vs. Other Thermosets for Theme Parks* (2001).

9.10.7 Hansen, R., and Dembsey, N.A., "The Influence of Fuel Surface Roughness and Surface structures on Ignition – An Exploratory Analysis", (2017)

9.10.8 **Brokaw, F.**, and Dembsey, N.A., "6 Inch Pit Cube Testing Letter Report", WPI final report for Courtney Carignan, Harvard T.H. Chan School of Public Health and Silent Spring Institute, Toxic Use Reduction Institute (TURI) Community and Small Business Grant Program (2017).

9.10.9 Kim, E., and Dembsey, N.A., "Development of Fire Modeling Tools for NSRDEC Shelter Design Final Report (Year 1)", WPI final report for Natick Soldier Research Development and Engineering Center, W911NF-16-2-0154 (2017).

9.10.10 Meacham, B.J., Dembsey, N.A., Kamath, P., Gollner, M.J., Marshall, A.W., Maisto, P., "Quantification of Green Building Features on Firefighter Safety", WPI and UMd final report for Department of Homeland Security, Federal Emergency Management Agency, EMW-2012-FP-01336 (2017).

9.10.11 Dembsey, N.A., Meacham, B.J., **Wang, H.G.**, "A Literature Review of Sprinkler Trade-offs", WPI final report for National Association of State Fire Marshalls (NASFM) Fire Research and Education Foundation (2017).

9.10.12 Dembsey, N.A., Meacham, B.J., **Wang, H.G.**, and Kamath, P. "Fire Modeling Results for Sprinkler Trade-offs Related to Building Size/Egress, Unprotected Opening Areas and Fire Resistance Ratings for Selected R-2 Occupancies", WPI final report for National Association of State Fire Marshalls (NASFM) Fire Research and Education Foundation (2017).

9.10.13 Dembsey, N.A., and **Wang, H.G.**, "Improving Disaster Resilience Through Scientific Data Collection with UAV Swarms, Task 4, Summary Report and Data Compilation Report", WPI final report for UCSD (Reference 92369262) and NIST (Reference 70NANB17H211) (2019).

9.11 Other Publications, Industry Outreach

9.11.1 Dembsey, N.A., Q&A: "Two Fire Safety Standards Composites Manufacturers Should Know", Blog Posting, *Composites Manufacturing, Official Magazine of the American Composites Manufacturers Association*, 5 October (2010).

9.11.2 Rowen, J. and Dembsey, N.A., "Applications: International Building Code: Meeting Requirements for Interior Composites", *Composites Technology*, Compositesworld.com, December2010).

9.11.3 Beaulieu, P., Magnone, Z., **Adams, V.**, Han, Z., **Southard, S.**, Su, C., Dembsey, N.A., Morgan, J., Magnone, Z., and Crocker, J., "Sprinkler Spray Effects on Combustion Products Leaving a Compartment", *Fire Safety World Magazine* (2011).

9.11.4 Dembsey, N.A., Meacham, B.J., Schebel, K., Johann, M., Tubbs, J., and Alston, J., "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 Magazine*, July (2012)

9.12 Other Publications, Service to Industry Data Reports, Not Peer-Reviewed

9.12.1 Dembsey co-author as Faculty Project Coordinator

9.12.2 1998: 2 reports. 1999: 4 reports. 2001: 5 reports. 2002: 10 reports. 2003: 9 reports. 2004: 9 reports. 2005: 4 reports. 2006: 19 reports. 2007: 19 reports. 2008: 20 reports. 2009: 24 reports. 2010: 23 reports. 2011: 15 reports. 2012: 20 reports. 2013: 9 reports. 2014: 11 reports. 2015: 17 reports. 2016: 9 reports. 2017: 21 reports. 2018: 7 reports. 2019: 5 reports. 2020: 4 reports. 2021: 1.

10 Scholarship in Progress

10.1 Manuscripts for Peer Review

10.1.1 Wang, H.G., Dembsey, N.A., Meacham, B.J., Liu, S.C., and Simeoni, A., "Conceptual Design of a Building Performance Monitoring Process", submitted to *Fire Technology*.

10.1.2 Wang, H.G., Dembsey, N.A., Meacham, B.J., Liu, S.C., and Simeoni, A., "A Sensitivity Matrix Method to Understand the Building Fire Egress Performance Gap", submitted to *Fire Safety Journal*.

10.1.3 N/A

10.2 Conference submissions (peer reviewed full manuscripts)

10.2.1 N/A

10.3 Conference submissions (peer reviewed abstracts)

10.3.1 N/A

10.4 Dissertations

10.4.1 N/A

10.5 MS Theses

10.5.1 N/A

10.6 Book Chapter

10.6.1 N/A

11 Fellowships, Grants, and Service to Industry Projects Awarded

11.1 Fellowships (Dembsey PI unless noted)

11.1.1 $10,000: “Qualitative Study of the Effect of a Compartment Enclosure on Fire Plume Entrainment”, SFPE Educational and Scientific Foundation, Society of Fire Protection Engineers. 1997 - 1998.

11.1.2 $3,500: “Quantitative Methods for Skin Burn Simulation”, engineering design guide development for *Society of Fire Protection Engineers Task Group on Engineering Practices*, SFPE Educational and Scientific Foundation, Society of Fire Protection Engineers. 1997 - 1998.

11.1.3 $16,702: "Room of Origin Fire Hazards", engineering practice document development for *Society of Fire Protection Engineers Task Group on Room of Origin Fire Hazards*, SFPE Educational and Scientific Foundation, Society of Fire Protection Engineers. 2001.

11.1.4 $570,780: "Two FPAs and support for Dembsey Materials Flammability Scholarship", FM Global Research Foundation. 2003 - 2005.

11.1.5 $165,457: "Continued support for Dembsey Materials Flammability Scholarship", FM Global Research Foundation. 2005 - 2007.

11.1.6 $4,356: “Modeling of Sprinkler and Water Mist Wetting of Radiantly Heated Porous Materials”, SFPE Educational and Scientific Foundation, Society of Fire Protection Engineers. 2009.

11.2 Grants (Dembsey PI unless noted)

11.2.1 $215,900: “Acquisition of Fire Modeling Research Apparatus”, NSF. 1996 - 1999. (PI: Prof. Lucht) Dembsey responsibilities: IR imaging $92,471 and smoke chamber $39,346.

11.2.2 $316,700: Participate in University of California, San Diego project. "Internationally Competitive Fast Ferries and Composite Ship Technologies", DTMA 91-97-H-0002. 1997 - 2000.

11.2.3 $9,005: Participate in K-Tech Corp. project. "New Methods for Evaluating the Thermal Performance of Protective Clothing for Fire Fighters", DOC-SBIR. 1997.

11.2.4 $5,335: Participate in K-Tech Corp. project. "Thermographic Phosphor Based Heat Flux Sensors", DOC-SBIR. 1997

11.2.5 $44,208: Participate in K-Tech Corp. project. "New Methods for Evaluating the Thermal Performance of Protective Clothing for Fire Fighters, Phase II", DOC-SBIR. 1998 - 2000.

11.2.6 $11,033: Participate in XC Associates project. "Standard Enclosure Program", Navy Contract N00178-98-C-3003. "Evaluation of Cored Composite Sandwich Panels for Instrument Consoles on Navy Vessels". 1999.

11.2.7 $25,865: Participate in Hughes Associates, Inc. project. "ISO 9705 Room Corner Test Prediction Model", DTCG39-99-F-E00159 (TO 0013). 1999.

11.2.8 $24,907: "Thermal Properties Evaluation for Protective Clothing Fabrics", U.S. Army Soldier and Biological Chemical Command, Soldier Systems Center. 2000.

11.2.9 $599,640: "Development of Guidelines for Obtaining Material Parameters for Input into Fire Models", 60NANB8D8106, Building and Fire Research Laboratory, NIST. 2008 - 2011. $199,722 for FY 2008-2009. $199,940 for FY 2009-2010. $199,978 for FY 2010-2011. No cost extension for FY 2011-2012. Total $599,640.

11.2.10 $74,000: "Collaborative Applied Fire Research: Flame Spread", ARUP North America Limited. 2008 - 2010. $50,000 for FY 2008-2009. $24,000 for FY 2009-2010.

11.2.11 $199,903: "Rail Vehicle Fire Hazard Guidance", 2009-ST-108-000013, Department of Homeland Security. 2008 – 2009. (PI: Prof. Meacham)

11.2.12 $124,903: "Fire Model Curriculum Development for Engineers and Non-Engineers in the Nuclear Power Industry", NRC-38-09-906, US Nuclear Regulatory Commission. 2009-2010.

11.2.13 $11,923: "Cone Calorimeter Testing for SRNS", G-SOW-H-00052 Rev 1, AC659290, Savannah River Nuclear Solutions. 2009.

11.2.14 $87,727: "Research in Support of Performance-Based Fire Safety Design", Korean Institute of Construction Technology. 2010. (PI: Prof. Meacham)

11.2.15 $48,424: "SRNS Phase II Fire Testing", DE-AC09-08SR22470, Savannah River Nuclear Solutions. 2010. No cost extension for 2011. No cost extension of 2012.

11.2.16 $998,446: "Quantification of Green Building Features on Firefighter Safety", DHS. 2013-2017. (PI: Prof. Meacham)

11.2.17 $154,694: “FAIL-SAFE Literature Review and Fire Modeling”, National Association of State Fire Marshals Fire Research and Education Foundation. 2017.

11.2.18 $147,580: “Development of Fire Modeling Tools for NSRDEC Shelter Design”, Natick Soldier Research, Development and Engineering Center. 2017.

11.2.19 $252,307: “Improving Disaster Resilience Through Scientific Data Collection with UAV Swarms”, UCSD (NIST). 2017-2019.

11.3 Service to Industry Projects (Dembsey PI unless noted)

11.3.1 1998: $3,450. 1999: $2,700. 2000: $4,250. 2001: $9,300. 2002: $25,440. 2003: $6,800. 2004: $76,800. 2005: $5,560. 2006: $18,550. 2007: $32,600. 2008: $4,450. 2009: $37,450. 2010: $32,450. 2011: $37,420. 2012: $48,850. 2013: $25,700. 2014: $35,500. 2015: $96,700. 2016: $92,800. 2017: $97,165. 2018 (NAD): $40,500. 2019 (NAD): $22,525. 2020 (NAD): $65,900. 2021 (NAD): $850.

12 Fellowships and Grants Not Awarded

12.1 Fellowships (Dembsey PI unless noted)

12.1.1 $49,154: “SFPE Engineering Task Group Engineering Practice (Design Guidance) Document Development via Student MS”, Society of Fire Protection Engineers. 1998.

12.1.2 $25,000: “Use of Structural Health Monitoring and BIM to Predict Collapse of Timber Structures Due to Fire”, Chief Donald J. Burns Memorial Research Grant, SFPE Educational and Scientific Foundation. 2014. (PI: Prof. Kim, CEE)

12.2 Grants (Dembsey PI unless noted)

12.2.1 $7,958: Participate in Giner, Inc. project. “Fast and Inexpensive Multi-Parameter Fire Detectors”, DOC-SBIR. 1997.

12.2.2 $111,888: “Development of Engineering Algorithms of Smoke Detector Response”, Building and Fire Research Laboratory, NIST. 1998.

12.2.3 $11,052: Participate in KaZaK Composites Inc. project. "Technology for Shipbuilding Affordability", Navy SBIR. 2000.

12.2.4 $16,357: Participate in Ktech Corp. project. "Flame/Thermal Protective Fabric Test Apparatus", US Army SBIR. 2000.

12.2.5 $43,850: Participate in Hughes Associates, Inc. project: "DOT Fire Life Safety Program", Volpe Center, DOT. 2001.

12.2.6 $15,170,835: "Center for Fire Performance Evaluation of Composite Materials", MRSEC, NSF. 2001. The MRSEC program at NSF supports university / industry consortia in the Materials Science area. Significant time has been spent on the pre-proposal and following up on it. The follow up work has involved establishing closer ties with various interested industries to support research and leverage this support with the US Government for further research support.

12.2.7 $912,978: "Determination of the Peer-Review and Collection Process for the Fire Science Multimedia Resourse", NSF. 2002. (PI: Prof. Woycheese)

12.2.8 $851,889: "Fire Science Multimedia Library", NSF. 2003. (PI: Prof. Woycheese)

12.2.9 Pre-proposal (Lehigh University lead institution): "Center for Multi Hazard Protection of Critical and Essential Structures", NSF, Proposal number 0506070. (PI: Prof. Notarianni)

12.2.10 Pre-proposal (UCSD lead institution): "ERC for Multi-Hazard Civil Infrastructure Protection", NSF. (PI: Prof. Notarianni)

12.2.11 Proposal: $570,762: "Fire Model Curriculum Development for Engineers and Non-Engineers in the Nuclear Power Industry", US Nuclear Regulatory Commission. 2009.

12.2.12 $2,683,095: Pre-proposal: "Engineering Research Center for Fire-safety Innovation, Research and Education (FIRE Center)", Michigan State University (lead), University of Maryland, University of Texas, Austin, Howard University and WPI, NSF. 2008-2009. (PI: Meacham)

12.2.13 $378,179: "Investigation of Post-Earthquake Fire Performance of Buildings", NIST. 2009. (PI: Prof. Meacham)

12.2.14 $435,011: "Investigation of Fire and Structural Collapse at Faculty of Architecture Building, Technical University at Delft", University of Texas, Austin (lead), Michigan State University and WPI, NIST. 2009. (PI: Prof. Meacham)

12.2.15 $1,484,041: "Integrated Approach to Performance-Based Design for Earthquake and Post-Earthquake Fire", NIST. 2009. (PI: Prof. Meacham)

12.2.16 $648,650: "Seismic Performance of Fire Protection Systems and Post-Earthquake Fire Performance of Buildings, Department of Homeland Security. 2010. (PI: Prof. Meacham)

12.2.17 $678, 786: "Rail Vehicle Fire Hazard Assessment Tools and Procedures", Department of Homeland Security. 2010. (PI: Prof. Meacham)

12.2.18 $328,256: “Seismic Performance of Fire Protection Systems and Post-Earthquake Fire Performance of Buildings, UCSD/United States Fire Administration. 2011. (PI: Prof. Meacham)

12.2.19 Pre-proposal: “PIRE: Realizing a Sustainable Built Environment”, NSF proposal number 1203940. 2011. (PI: Prof. Meacham)

12.2.20 $394,000: “An Integrated Modeling and Control Framework of Smart Structures for High Impact Force Attentuations”, NSF. 2012. (PI: Prof. Kim, Civil Eng.)

12.2.21 $140,463: “Modeling and Control of Smart Structures for High Speed Impact Force Attenuations”, National Cooperative Highway Research Program. 2012. (PI: Prof. Kim, Civil Eng.)

12.2.22 $9,995: “Imaging Through Low-Visibility Fire Smoke for Ship-Board Navigation of Robotic Fire-Fighting Systems – IR Labs, Cameras, and Sensors Evaluation”, Infrared Laboratories (US Navy). 2012.

12.2.23 $51,761: “Imaging Through Low-Visibility Fire Smoke for Ship-Board Navigation of Robotic Fire-Fighting Systems – BCO LADAR and RADAR Sensors Evaluation, BCO Inc. (US Navy). 2012.

12.2.24 $323,819: “Next Generation of SCBA Face Piece Lenses”, Fire Protection Research Foundation (FEMA). 2012.

12.2.25 $908,695: “Thermal Analysis and Design Tool for SCBA Facepiece Lenses”, Fire Protection Research Foundation (DHS). 2013.

12.2.26 $400,000: “Automated Process for the Fabrication of Highly Customized Thermally Insulated Cladding Systems”, Department of Energy STTR. 2015. (PI: Prof. Van Dessel)

12.2.27 $395,560: “Flame-retardant and Robust Multi-nanosenors-integrated Fabrics for Enhancing Fire Safety and Occupational Health of First Responders”, DHS, Sub-Award from U. Connecticut. 2017.

12.2.28 $398,638: “Robust and Smart Multi-senor-integrated Fabrics for Enhancing Fire Safety and Occupational Health of First Responders”, DHS, Sub-Award from U. Connecticut. 2020.

13 Pending Proposals

13.1 On record with WPI (Dembsey PI unless noted)

13.1.1 N/A

13.2 In Progress for Submission (Dembsey PI unless noted)

13.2.1 N/A

13.3 Other (Dembsey PI unless noted)

13.3.1 N/A

14 Patents Awarded and Pending

14.1 Awarded

14.1.1 None.

14.2 Pending

14.2.1 None.

15 Consulting

15.1 Fire Science Consulting

15.1.1 Retained by Cinnabar-Florida, Orlando, FL, USA on the project "Phenolics vs. Other Thermosets for Theme Parks". Primary responsibility involved determining the fire characteristics (surface flame spread) of various fiber reinforced plastic (FRP) composite systems. In part this has involved designing and conducting half-scale corner tests in the WPI Fire Science Laboratory. Analysis of the corner test results as well as other testing on the systems was written up in a report for Cinnabar. Report results were presented to Clark County, Nevada Department of Building officials as part of their ongoing educational seminar series. 2000.

15.1.2 Retained by SwissRe International Business Insurance Co. Ltd. as a member of their Causation Team investigating the 11 September 2001 attacks on the World Trade Centers. Primary responsibility involved addressing the hypothetical scenario of only one airplane causing the collapse of 1 WTC and the effect on 2 WTC. Activities involve fire growth modeling and fire protection system evaluation in 2 WTC for this scenario as well as managing the Fire Team and interfacing with the Structural Team for fire load evaluation on 2 WTC. 2002.

15.1.3 Retained by William Kreysler & Associates as a member of their team developing a proposal for an unconventional FRP roof for the San Francisco Science Center. Primary responsibility involved providing materials flammability and fire resistance expertise. 2003.

15.1.4 Retained by the Law Offices of Joseph J. Cariglia, P.C. for a lawsuit involving skin burns. Primary responsibility was to provide fire dynamics expertise in relation to fire ball potential from a butane lighter. Deposed and provided trial expert testimony. United States District Court, District of Massachusetts, Docket No.: 02-40037-CBS, Stephen A. Lacroix, PPA, Roger D. LaCroix, Jr., Plaintiff vs. Bic Corporation, Defendant. 2003.

15.1.5 Retained by Plauché, Maselli, Landry & Parkerson, L.L.P. for a lawsuit involving smoke damage from a mattress fire. Primary responsibility was to provide fire modeling (FDS) expertise in relation to smoke travel for various potential building configurations involving mattress fires. State of Louisiana v. Hill-Rom Co., Inc, et al, CDC No: 2001-17455 "N". 2004.

15.1.6 Retained by Currie & McLafferty, Attorneys at Law, for a lawsuit involving skin burns. Primary responsibility was to provide fire dynamics expertise in relation to potential clothing ignition and fire spread from a butane lighter malfunction. Gail Yakupchina v. BIC Corporation. 2005.

15.1.7 Retained by Robinson & Cole, LLP, for a lawsuit involving a fire at the Kendall Center for the Arts. Primary responsibility was to provide expert evaluation of the fire modeling and fire scenario development of opposing expert. Town of Belmont v. Toastmaster, Inc., et al, Middlesex Superior Court No. 02-00865. 2005.

15.1.8 Retained by TouchStone Systems and Services, Inc. to help evaluate and upgrade their oxygen consumption calorimeter hardware and software. 2005.

15.1.9 Retained by Ontar Corporation to be a member of their team for proposal submission: US Air Force SBIR AF06-121: Graphical User Interface for Fire Modeling Codes – FL (north); Phase I. Primary responsibility was to provide expertise in fire model formulation of relevant physics and chemistry. 2006.

15.1.10 Retained by Robinson & Cole, LLP, for a lawsuit involving a fire at Veteran's Memorial Ice Rink, 8 January 2006. The Hartford insured: City of Cranston. RI. The Hartford Claim No. CP0006188278. Primary responsibility was to provide expertise in fire growth evaluation and fire modeling of potential scenarios. 2006.

15.1.11 Retained by Bowditch & Dewey, LLP, to interpret reaction to fire test results for a client company to assess potential fire hazard and risk in end use applicatons. 2007.

15.1.12 Retained by Cozen O'Connor to evaluate the fire characteristics of FRP composites involved in a food processing facility fire. 2008.

15.1.13 Retained by Arcoplast, Inc. to evaluate the fire characteristics of select Arcoplast FRP composites for FM Global and European Union testing, approval and listing. 2008.

15.1.14 Retained by Textron Systems Corporation to provide expert advice relative to a Textron lead fire investigation related to an incident at one of Textron's facilities. 2008.

15.1.15 Retained by Sentry Safe, Rochester, NY, USA, to provide expert advice relative to the project entitled: Sentry Safe Alternative Materials System Project. 2010-2011.

15.1.16 Retained by fiber reinforced polymer manufacturers and material suppliers to provide expert advice on development of materials systems compliant with International Building Code requirements. 6 companies. 2012.

15.1.17 Retained by fiber reinforced polymer manufacturers and material suppliers to provide expert advice on development of materials systems compliant with International Building Code requirements. 4 companies. 2013.

15.1.18 Retained by NSRDEC to provide expert advice on development of a fire testing paradigm for modern rigid wall shelters. 2015.

15.1.19 Retained by NSRDEC to provide expert advice on development of a fire testing paradigm for modern rigid wall shelters. Retained by Parsons Brinckerhoff to provide expert advice on development of design fire HRR curves using fire modeling. 2016.

15.1.20 Retained by Arrowhead Plastic Engineering to provide expert advice on Cone screening data of FRP systems for various aspects of building code compliance. 2017.

15.1.21 Retained by a window manufacturing company to provide analysis of building code requirements for windows in various building types. Retained by a consulting firm to support their project with WPI FPE for manufacturing and calibration of thin skin calorimeter heat flux sensors. 2018.

15.1.22 Retained by a research company as part of an SBIR project to provide fire testing and fire modeling expertise for validation of a CFD based fire model. 2019.

15.1.23 Retained by a research company as part of an SBIR project to provide fire testing and fire modeling expertise for validation of a CFD based fire model. Retained by a consulting firm to support their work with a government agency to develop manuscripts for peer reviewed publication. Retained by a consulting firm to support their work with a government agency to adapt ISO fire test standards to local conditions. 2020.

15.1.24 Retained by a FRP fabricator to compile and detail IBC exterior wall requirements for combustible materials/assemblies. Retained by a curtain wall manufacturer to provide advice on IBC requirements for the use of FRP on exterior walls. Retained by a FRP fabricator to compile and detail IBC exterior wall projection requirements for combustible materials/assemblies.

16 Presentations at Conferences, Seminars, and Colloquia

16.1 Conferences

16.1.1 Dembsey, N.A., and Williamson, R.B., "The Effect of Ignition Source Exposure and Specimen Configuration on the Fire Growth Characteristics of a Combustible Interior Finish Material", Presented at 'Heat Release and Fire Hazard', 1st US Symposium, San Diego, CA, USA, 12-13 December (1991).

16.1.2 Dembsey, N.A., Pagni, P.J., and Williamson, R.B., "Fire Near Field Entrainment Measurements", Presented as a work-in-progress poster at the 25th Symposium (International) on Combustion, Irvine, CA, USA, 31 July - 5 August (1994).

16.1.3 Dembsey, N.A., Pagni, P.J., and Williamson, R.B., "Compartment Fire Experiments: Comparison with Models", Presented at the International Conference on Fire Research and Engineering, Orlando, FL, USA, 10-15 September (1995).

16.1.4 Dembsey, N.A., and Williamson, R.B., "Evaluation of a Fire Spread Model's Prediction of Critical Ignition Source Strength", Presented as a poster at INTERFLAM'96, St. John's College, Cambridge, UK, 26-28 March (1996).

16.1.5 Wolski, A., Dembsey, N.A., and Meacham, B.J., "The Use of Acceptable Risk Principles in the Development of Performance Based Building Fire Safety Codes", Presented as a poster at the Fifth International Symposium on Fire Safety Science, The World Congress Centre, Melbourne, Victoria, Australia, 3-7 March (1997).

16.1.6 Dembsey, N.A., and Williamson, R.B., "Coupling the Fire Behavior of Contents and Interior Finishes for Performance Fire Codes: Evaluation of a Fire Spread Model", Presented at 2nd International Conference on Fire Research and Engineering, National Institutes of Standards and Technology, Gaithersburg, MD, USA, 10-15 August (1997).

16.1.7 Laramee, S.T., and Dembsey, N.A., "Analysis of Aircraft Hanger Fire Experiments: Characterization of Fire Heat Release Rates, and Plume and Ceiling Jet Temperatures", Presented at 2nd International Conference on Fire Research and Engineering, National Institutes of Standards and Technology, Gaithersburg, MD, USA, 10-15 August (1997).

16.1.8 Anderson, S.K. and Dembsey, N.A., "Qualitative Study of the Effect of a Compartment Enclosure on Fire Plume Entrainment", Presented at 2nd International Conference on Fire Research and Engineering, National Institutes of Standards and Technology, Gaithersburg, MD, USA, 10-15 August (1997).

16.1.9 Wolski, A., Dembsey, N.A., and Meacham, B.J., "Application of Acceptable Risk Principles to the Development of Performanced Based Building Fire Safety Regulation", Presented at 2nd International Conference on Performance-Based Codes and Fire Safety Design Methods, Maui Marriott, Lahaina, Maui, Hawaii, USA, 7-9 May (1998).

16.1.10 Dembsey, N.A., "Fire Characterization of Composite Materials for High Speed Craft – Current Research and Development at WPI", Presented at Fire and Materials '99, 6th International Conference and Exhibition, St. Anthony Hotel, San Antonio, TX, USA, 22-23 February (1999).

16.1.11 Lantz, R.V., Dembsey, N.A., and Barnett, J.R., "An Argument for Information Theory as a Strategy for Model Validation", Presented at SFPE Symposium on Risk, Uncertainty, and Reliability in Fire Protection Engineering, Omni Inner Harbor Hotel, Baltimore, MD, USA, 12-14 May (1999).

16.1.12 Wolski, A., Dembsey, N.A., and Meacham, B.J., "Evaluating a Building Fire Safety Code Using Seven Guiding Principles for Risk Acceptability: An Example", Presented at SFPE Symposium on Risk, Uncertainty, and Reliability in Fire Protection Engineering, Omni Inner Harbor Hotel, Baltimore, MD, USA, 12-14 May (1999).

16.1.13 Wolski, A., Dembsey, N.A., and Meacham, B.J., "Accommodating Perceptions of Risk in Performance-based Building Fire Safety Code Development", Presented at Interflam'99, 8th International Fire Science & Engineering Conference, Edinburgh Conference Centre, Edinburgh, Scotland, UK, 29 June-1 July (1999).

16.1.14 Wieczorek, C.J., and Dembsey, N.A., "Choosing Appropriate Safety Factors for Use with Engineering Correlations for Predicting 1st and Superficial 2nd Degree Skin Burns from Thermal Radiation", Presented at 3rd International Conference on Fire Research and Engineering, Ramada Congress Hotel, Chicago, IL, USA, 4-8 October (1999).

16.1.15 Wright, M., Barnett, J.R., and Dembsey, N.A., "Flame Spread on Cored Composite Panels for Use in High Speed Craft", Presented at 3rd International Conference on Fire Research and Engineering, Ramada Congress Hotel, Chicago, IL, USA, 4-8 October (1999).

16.1.16 Dembsey, N.A., “Engineering Guide: Predicting 1st and 2nd Degree Skin Burns From Thermal Radiation”, as part of The SFPE Thermal Hazards Guide, NFPA Education Session T09, Presented at NFPA World Fire Safety Congress and Exposition, Colorado Convention Center, Denver, CO, USA, 14-17 May (2000).

16.1.17 Lantz, R.V., Dembsey, N.A., and Barnett, J.R., "Model Validity Defined and Applied to the Problem of Making Legitimate Predictions for Fire Protection Engineering Models", Presented at 3rd International Conference on Performance-Based Codes and Fire Safety Design Methods, Lund University, Lund, Sweden, 15-17 June (2000).

16.1.18 Gagnon, B., Dembsey, N.A., and Keltner, N., "Preliminary Results from New Methods for Evaluation of Fire Fighting Clothing", Presented at Fire and Materials 2001, 7th International Conference and Exhibition, Sheraton Fisherman's Wharf Hotel, San Francisco, CA, USA, 22-24 January (2001).

16.1.19 Hurley, M. and Dembsey, N.A., “Room of Origin Fire Hazard Task Group Update", as part of Engineering Guides to Support Performance-Based Design, Part 1, NFPA Education Session T06, Presented at NFPA World Fire Safety Congress and Exposition, Anaheim Convention Center, Anaheim, CA, USA, 13-17 May (2001).

16.1.20 Lautenberger, C.W., Dembsey, N.A., and Barnett, J.R., "Development of an Upward Flame Spread Forward Heating Algorithm for Use in CFD Models", Presented at The International Conference on Engineered Fire Protection Design, Sir Francis Drake Hotel, San Francisco, CA, USA, 11-15 June (2001).

16.1.21 Alston, J.J., Dembsey, N.A., and Barnett, J.R., "Compartment Fire Dynamics Model Calibration Data: Marine Composite Screening Specimens", Presented at Interflam2001, 9th International Fire Science and Engineering Conference, Edinburgh Conference Centre, Edinburgh, Scotland, 17-19 September 2001.

16.1.22 Dore, C.H., Qureshi, S.P., Schofield, R.A., and Dembsey, N.A., "Cinnabar's Quest for the Finest Fire Retardant Composite", Presented at Composites 2001, Tampa Convention Center, Tampa, FL, USA, 3-6 October 2001.

16.1.23 Dore, C.H., Dembsey, N.A., Lee, C.M. and Qureshi, S.P., "Fire Growth Evaluation and Mechanical Properties of Seven Thermoset Composites", Presented at 23rd SAMPE Europe International Conference, Paris Expo, Porte de Versailles, Paris, France, 9-11 April 2002.

16.1.24 Alston, J.J., and Dembsey, N.A., "Marine Composite Material Fire Properties: Implications of Uncertainty", Presented at SAMPE 2002, Long Beach Convention Center, Long Beach, CA, USA, 12-16 May 2002.

16.1.25 Dembsey, N.A., Lee, C.M. and Qureshi, S.P., "Fire Growth Evaluation and Mechanical Properties of Seven Thermoset Composites", Presented at SAMPE 2002, Long Beach Convention Center, Long Beach, CA, USA, 12-16 May 2002. Outstanding Paper Award at SAMPE 2002 - 2nd Place.

16.1.26 Alston, J.J. and Dembsey, N.A., "Evaluation of Dimensionless Flame Height Parameters to Account for Fuel Source Effects", Presented at the 7th International Symposium on Fire Safety Science, WPI, Worcester, MA, USA, 16-21 June 2002.

16.1.27 Dembsey, N.A., Lee, C.M. and Qureshi, S.P., "Fire Growth Evaluation and Mechanical Properties of Seven Thermoset Composites", Presented at TAPPI 2002 Decorative & Industrial Laminates Symposium, Omni Hotel at CNN Center, Atlanta, GA, USA, 19-21 August 2002.

16.1.28 Dembsey, N.A., "Evaluating Fire Characteristics of FRP", Presented at Composites 2002, Georgia World Congress Center, Atlanta, GA, USA, 25-27 September 2002.

16.1.29 Alston, J.J., and Dembsey, N.A., "Marine Composite Material Fire Properties: Implications of Uncertainty", Presented at Fire and Materials 2003, 8th International Conference, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 27-28 January 2003.

16.1.30 Alston, J.J., and Dembsey, N.A., "Marine Composite Material Fire Properties: Implications of Uncertainty", Presented at Fire and Materials 2003, 8th International Conference, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 27-28 January 2003.

16.1.31 Beaulieu. P.A., Dembsey, N.A. and Alpert, R.L., "A New Material Flammability Apparatus and Measurement Techniques", Presented at Composites 2003, Anaheim Convention Center, Anaheim, CA, USA, 1-3 October (2003).

16.1.32 Beaulieu. P.A., Dembsey, N.A. and Alpert, R.L., “Flammability Characteristics at Applied Heat Flux Levels up to 220 kW/m^2: Time to Ignition, Mass Loss Flux and Thermal Properties”, Presented at Interflam2004, 10th International Fire Science and Engineering Conference, Edinburgh Conference Centre, Edinburgh, Scotland, 5-7 July (2004).

16.1.33 Zhao, L. and Dembsey, N.A., “Uncertainty Effects on Measurement of Fire Characteristics of Material Systems”, Presented at Composites 2004, Tampa Convention Center, Tampa, FL, USA, 6-8 October (2004).

16.1.34 Beaulieu. P.A., Dembsey, N.A. and Bill, R.G., “Flammability Characteristics at Applied Heat Flux Levels up to 220 kW/m^2: Time to Ignition, Mass Loss Flux and Thermal Properties”, Presented at Composites 2004, Tampa Convention Center, Tampa, FL, USA, 6-8 October (2004).

16.1.35 Zhao, L. and Dembsey, N.A., "Uncertainty Effects on Measurement of Fire Characteristics of Material Systems", Presented at Fire and Materials 2005, 9th International Conference, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 31 January – 1 February (2005).

16.1.36 Beaulieu. P.A. and Dembsey, N.A., "Enhanced Equations for Oxygen and Carbon Dioxide Calorimetry", Presented at Fire and Materials 2005, 9th International Conference, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 31 January – 1 February (2005).

16.1.37 Ierardi, J., Dembsey, N.A. and Barnett, J.R., "Towards the Development of a Mass Transport Model for Smoke Detector Response", Presented at 9th Fire Suppression & Detection Research Symposium, Fire Protection Research Foundation, NFPA, Holiday Inn, Orlando, FL, USA, 26-28 January (2005).

16.1.38 Patra, P.K., Shanmuganathan, K., Razdan, S., Fan, Q., Kim, Y.K., Warner, S.B., Calvet, P.D., and Dembsey, N.A., "Fire Retardancy and Morphology of Nylon 6-Clay Nanocomposite Compositions", Presented at Degradation Processes in Nanostructured Materials, MRS Proceedings Volume 887, Materials Research Society, Fall Meeting 2005, Boston, MA.

16.1.39 Beaulieu. P.A., Dembsey, N.A. and Bill, R.G., "Use of Enhanced Oxygen in Small Scale Vertical Flame Spread", Presented at Composites 2005, Greater Columbus Convention Center, Columbus, OH, USA, 28-30 September (2005).

16.1.40 Zhao, L. and Dembsey, N.A., "Measurement Uncertainty Analysis for Fire Calorimetry Apparatuses", Presented at Composites 2005, Greater Columbus Convention Center, Columbus, OH, USA, 28-30 September (2005).

16.1.41 Kwon, J.W. and Dembsey, N.A., "Evaluation of FDS v.4's Capability to Evaluate Vertical Flame Spread", Presented at NFPA World Safety Conference and Exposition, Orange County Convention Center, Orlando, FL, USA, 4-8 June (2006).

16.1.42 Beaulieu. P.A., Dembsey, N.A. and Bill, R.G., "Ignition and Burning Behavior at High Heating Rates (Applied Heat Flux Levels), Presented at 2006 NATAS Conference, North American Thermal Analysis Society 34th Annual Conference, Holiday Inn University Plaza Hotel, Bowling Green, KY, USA, 6-9 August (2006).

16.1.43 Beaulieu. P.A., Dembsey, N.A. and Bill, R.G., "Burning Behavior at High Applied Heat Flux Levels: Implications for Determination of Material Properties", Presented at Composites 2006, America's Center, St Louis, MO, USA, 18-20 October (2006).

16.1.44 Avila, M., Dembsey, N.A. and Dore, C.H., "Effect of Resin Type and Glass Content on Fire Engineering Properties of FRP Composites", Presented at Composites 2006, America's Center, St Louis, MO, USA, 18-20 October (2006).

16.1.45 Coles, A., Wolski, A., Lautenberger, C.W., and Dembsey, N.A., "Building Code Requirements for Performance Based Designs and Fire Modeling", Presented at Composites 2006, America's Center, St Louis, MO, USA, 18-20 October (2006).

16.1.46 Beaulieu, P.A., and Dembsey, N.A., "Burning Behavior at High Applied Heat Flux Levels and Flame Heat Flux in Enhanced Ambient Oxygen", Presented at Fire and Materials 2007, 10th International Conference, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 29-31 January (2007).

16.1.47 Avila, M.B., Dembsey, N.A., and Dore C.H., "Effect of Resin Type and Glass Content on the Fire Engineering Properties of Typical FRP Composites", Presented at Fire and Materials 2007, 10th International Conference, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 29-31 January (2007).

16.1.48 Rangwala, A.S., Buckley, S.G., Dembsey, N.A., and Torero, J.L., "Modeling Solid-phase Pyrolysis using Emmons' Burning Rate Solution – Application of FDS", Presented at 5th International Seminar on Fire and Explosion Hazards, University of Edinburgh, Scotland, UK, April (2007).

16.1.49 Huo, Yue, Fan, Qinguo, Dembsey, N.A., and Patra, P.K., "Influence of Polyborosiloxane on the Flame Retardancy of Polyethylene Terephthalate-clay Nanocomposite", Presented at Division of Polymeric Materials: Science and Engineering, 233rd ACS National Meeting, Chicago, IL, USA, 25-29 March (2007).

16.1.50 Kim, M.H., Woycheese, J.P., and Dembsey, N.A., "Sensitivity Analysis of Fire Dynamics Simulator Version 4.0 for Tunnel Fire Scenarios with Forced Longitudinal Ventilation", Presented at Interflam2007, 11th International Fire Science and Engineering Conference, University of London, Royal Holloway College, London, UK, 3-5 September (2007).

16.1.51 Huo, Yue, Fan, Qinguo, Dembsey, N.A., and Patra, P.K., "Influence of Polyborosiloxane on the Flame Retardancy of Polyethylene Terephthalate-clay Nanocomposite", Presented at 2007 MRS Spring Meeting, Moscone West, San Francisco, CA, USA, 9-13 April (2007).

16.1.52 Avila, M.B., Dembsey, N.A., Kim, M.H., Lautenberger, C.W., and Dore, C.H., "Fire Characteristics of Polyester FRP Composites with Different Glass Contents", Presented at Composites & Polycon 2007, Tampa Convention Center, Tampa, FL, USA, 17-19 October (2007). Best Overall Technical Paper Award at *Composites & Polycon 2007*.

16.1.53 Patra, P.K., Shanmuganathan, K., Deodhar, S., Dembsey, N.A., Warner, S.B., Calvert, P., Fan, Q., "Fire Retardation in Nylon 6-layered Silicate Nanocomposites: Films, Fibers and Fabrics", Presented at Division of Polymeric Materials: Science and Engineering, 235th ACS National Meeting, New Orleans, LA, USA, 6-10 April (2008).

16.1.54 Patra, P.K., Shanmuganathan, K., Fan, Q., Calvert, P., Warner, S., Kim, Y.K., and Dembsey, N.A., " Flame Retardancy of Polyamide 6-layered Silicate Nanocomposite Films and Fabrics", Presented at the BCC Research 19th Annual Recent Advances in Flame Retardancy of Polymeric Materials", Holiday Inn Select, Stamford, CT, USA, 9-11 June (2008).

16.1.55 Dembsey, N.A., "Development of Guidelines for Obtaining Material Parameters for Input into Fire Models", Presented at the Annual Fire Conference, National Institute of Standards and Technology, Gaithersburg, MD, USA, 31 March – 2 April (2008).

16.1.56 Dembsey, N.A., "Pyrolysis Modeling of FRP Composites", Presented at Cluster F: Fire-Safe Polymers & Polymer Composites, Polymer Event, CUMIRP, Center for Research on Polymers, University of Massachusetts, Amherst, MA, USA, 13 May (2008).

16.1.57 Dembsey, N.A., "Fire Characteristics of Materials: Comments Relevant to Simulation of Fire Growth Scenarios", Presented at To Build a Better Business, The RJA Group 2008 Leadership Conference, Eaglewood Resort & Spa, Chicago, IL, USA, 11-12 September (2008). Invited Guest Keynote Speaker.

16.1.58 Lautenberger, C.W., Kim, M.H., Dembsey, N.A., Fernandez-Pello, C., "The Role of Decomposition Kinetics in Pyrolysis Modeling: Application to a Fire Retardant Polyester Composite", Presented at the 9th International Symposium on Fire Safety Science, Karlsruhe, Germany, 21-26 September (2008).

16.1.59 Park, H.J., Joshi, K., Rangwala, A.S., Dembsey, N.A., Granite, E.J., "Estimation of Thermal and Kinetic Parameters to Model Coal Dust Ignition", Presented at Pittsburgh Coal Conference, University of Pittsburgh, 29 September – 2 October (2008).

16.1.60 Park, H.J., Rangwala, A.S., Dembsey, N.A., and Granite, E.J., "Estimation of Thermal and Kinetic Parameters to Model Coal Dust Ignition", Presented at Mary K. O'Connor Process Safety Conference, Texas A&M University, 28-29 October (2008).

16.1.61 Brown, J., Jervis, F., Rockwell, S., Rangwala, A.S., and Dembsey, N.A., "Characterizing Material Flammability Using a Critical B-number", Presented at SFPE Professional Development Conference and Exposition, Renaissance Charlotte Suites Hotel, Charlotte, NC,USA, 12-17 October (2008).

16.1.62 Kim, M.H., Lautenberger, C.W., and Dembsey, N.A., "Property Estimation for Pyrolysis Modeling Applied to Polyester FRP Composites with Different Glass Contents", Presented at Composites & Polycon 2009, American Composites Manufacturers Association, Tampa Convention Center, Tampa, FL, USA, 15-17 January (2009).

16.1.63 Beaulieu, P.A., Dembsey, N.A., Dore, C., Park, H.J., "Experimental Results on The Intermediate Scale Fire Spread Characteristics of Typical FRP Composites", Presented at Composites & Polycon 2009, American Composites Manufacturers Association, Tampa Convention Center, Tampa, FL, USA, 15-17 January (2009).

16.1.64 Dembsey, N.A., "Ensuring Success in the Building Code with Product Listing and Labeling", Presented at Composites & Polycon 2009, American Composites Manufacturers Association, Tampa Convention Center, Tampa, FL, USA, 15-17 January (2009).

16.1.65 Coles, A., Wolski, A., Lautenberger, C., and Dembsey, N.A., "Using Computer Fire Modeling to Reproduce and Predict FRP Composite Fire Performance", Presented at Composites & Polycon 2009, American Composites Manufacturers Association, Tampa Convention Center, Tampa, FL, USA, 15-17 January (2009).

16.1.66 Kim, M.H., Lautenberger, C.W., and Dembsey, N.A., "Property Estimation for Pyrolysis Modeling Applied to Polyester FRP Composites with Different Glass Contents", Presented at Fire and Materials 2009, 11th International Conference, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 26-28 January (2009).

16.1.67 Lautenberger, C.W., Wong, W.C., Coles, A., Dembsey, N.A., Fernandez-Pello, C., "Large-Scale Turbulent Flame Spread Modeling with FDS5 on Charring and Noncharring Materials", Presented at Fire and Materials 2009, 11th International Conference, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 26-28 January (2009).

16.1.68 Dembsey, N.A., Janssens, M., and Hurley, M., "The Materials Bible", Presented at the Annual Fire Conference, National Institute of Standards and Technology, Gaithersburg, MD, USA, 28 – 30 April (2009).

16.1.69 Wong, W.C., Lautenberger, C.W., Coles, A., Dembsey, N.A., and Fernandez-Pello, C., "Vertical Wall Flame Spread Experiments and Modeling with FDS5", Presented at 2009 The Annual Meeting – SFPE Professional Development Conference and Exposition", Doubletree Paradise Valley Resort , Scottsdale, AZ, USA, 17-23 October (2009).

16.1.70 Accosta, R.F., Meacham, B.J., Dembsey, N.A., and Crocker, J., "The Effects of Sprinkler Sprays on the Transport of Toxic Products", Presented at 2009 The Annual Meeting – SFPE Professional Development Conference and Exposition", Doubletree Paradise Valley Resort , Scottsdale, AZ, USA, 17-23 October (2009).

16.1.71 Kim, M.H., Dembsey, N.A., and Dore, C.H., "Property Estimation for Pyrolysis Modeling Applied to Flame Retarded Modified Acrylic FRP Composites", Presented at Composites & Polycon 2010, American Composites Manufacturers Association, Mandalay Bay, Las Vegas, NV, USA, 9-11 February (2010).

16.1.72 **Sipe, J.E.**, and Dembsey, N.A., "A Porous Media Model for Fire Sprinkler Wetting", Presented at Interflam 2010, 12th International Conference on Fire Science and Engineering, Interscience Communications, East Midlands Conference Centre, University of Nottingham, UK, 5-7 July (2010).

16.1.73 **Kim, M.H.**, Shivkumar, S., and Dembsey, N.A., "Thermal Degradation Kinetics Modeling for Pyrolysis Modeling Using Fire Retarded Thermoset Ploymer Resins", Presented at Interflam 2010, 12th International Conference on Fire Science and Engineering, Interscience Communications, East Midlands Conference Centre, University of Nottingham, UK, 5-7 July (2010).

16.1.74 **Accosta, R.**, Magnone, Z., Crocker, J., Xiao, B., Dembsey, N.A., and Meacham, B.J., "Transport of Toxic Products – Comparison of Experimental and Numerical Results Part One: Non-Sprinklered Scenarios", Presented at Interflam 2010, 12th International Conference on Fire Science and Engineering, Interscience Communications, East Midlands Conference Centre, University of Nottingham, UK, 5-7 July (2010).

16.1.75 Lautenberger, C.W., **Wong, W.C.**, Coles, A., Dembsey, N.A., and Fernandez-Pello, C., "Comprehensive Data Set for Validation of Fire Growth Models: Experiments and Modeling", Presented at Interflam 2010, 12th International Conference on Fire Science and Engineering, Interscience Communications, East Midlands Conference Centre, University of Nottingham, UK, 5-7 July (2010).

16.1.76 Lautenberger, C.W., **Wong, W.C.**, Coles, A., Dembsey, N.A., and Fernandez-Pello, C., "Comprehensive Data Set for Validation of Fire Growth Models: Experiments and Modeling", Presented at International Congress on Combustion and Fire Dynamimcs, University of Cantabria, Santander, Spain, 20-23 October (2010).

16.1.77 Meacham, B.J., Dembsey, N.A., Johann, M.A., Tubbs, J.S., and **Schebel, K.**, "A Simplified Approach for Assessing Initial Fire Development and Spread in Passenger Rail Vehicles", Presented at Transportation Research Board 90th Annual Meeting, TRB 2011, Transportation Research Board of the National Academies, Marriott Wardman Park, Omni Shoreham and Washington Hilton Hotels, Washington, DC, USA, 23-27 January (2011). Paper 11-1513.

16.1.78 **Kim, M.H.**, and Dembsey, N.A., "Evaluation of Different Approaches for Property Estimation for Pyrolysis Modeling Applied to FRP Composites", Presented at Composites 2011, The Composites Exhibition and Convention, American Composites Manufacturers Association, Broward County Convention Center, Ft. Lauderdale, FL, USA, 2-4 February (2011).

16.1.79 **Kim, M.H.**, and Dembsey, N.A., "Evaluation of Different Approaches for Property Estimation for Pyrolysis Modeling Applied to FRP Composites", Presented at Fire and Materials 2011, 12th International Conference, Interscience Communications, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 31 January – 2 February (2011).

16.1.80 **Sipe, J.E.**, and Dembsey, N.A., "A Porous Media Model for Fire Sprinkler Wetting", Presented at Fire and Materials 2011, 12th International Conference, Interscience Communications, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 31 January – 2 February (2011).

16.1.81 Magnone, Z., **Adams, V.**, Han, Z., **Southard, S.**, Su, C., Dembsey, N.A., Morgan, J., and Beaulieu, P., "Sprinkler Spray Effects on Combustion Products Leaving a Compartment", Presented at Suppression, Detection and Signaling Research and Applications, a Technical Working Conference, SUPDET 2011, NFPA, International Plaza Resort and Spa, Orlando, FL, 22-25 March (2011).

16.1.82 Dembsey, N.A., "FRP in the International Building Code (IBC)", Presented at Construction, Corrosion and Infrastructure Conference, American Composites Manufacturers Association, Caesars Palace, Las Vegas, NV, USA, 9-11 May (2011) **Invited presentation**.

16.1.83 **Schebel, K.**, Meacham, B.J., Dembsey, N.A., Johann, M.A., and Tubbs, J.S., "A Simplified Approach for Assessing Initial Fire Development and Spread", Presented at NFPA Conference and Expo, Boston, MA, USA, 12-15 June (2011).

16.1.84 Dembsey, N.A., and **Kim, M.H.**, "Fire Pyrolysis Parameter Guidance and Lessons Learned for Future Work, Presented at Workshop 3, FIRE: Approaches for and challenges in parameter estimation for pyrolysis models, 10th International Symposium on Fire Safety Science, College Park, Maryland, USA, 19-24 June (2011). **Invited presentation**.

16.1.85 Janssens, M., Dembsey, N.A., and Hurley, M., "SFPE Pyrolysis Model Parameter Guide", Presented at Fire and Evacuation Modeling Conference, Thunderhead Engineering, Waterfront Marriott, Baltimore, MD, USA, 15-16 August (2011). **Invited presentation**.

16.1.86 Dembsey, N.A., Janssens, M., and Hurley, M., "Overview of Guidelines for Obtaining Material Parameters for Input into Fire Models, Presented at SFPE Professional Development Conference and Exposition, SFPE, Portland Marriott Downtown Waterfront, Portland, OR, USA, 23-28 October (2011).

16.1.87 Dembsey, N.A., Janssens, M., and Hurley, M., "SFPE Engineering Guide for Estimating Material Pyrolysis Properties for Fire Models, Presented at Workshop, SFPE Professional Development Conference and Exposition, SFPE, Portland Marriott Downtown Waterfront, Portland, OR, USA, 23-28 October (2011).

16.1.88 Schebel, K., Meacham, B.J., Dembsey, N.A., Tubbs, J., Johann, M., and Alston, J.J., "Fire Growth Simulation in Passenger Rail Vehicles Using a Simplified Flame Spread Model Coupled with a CFD Fire Model", Presented at SFPE Professional Development Conference and Exposition, SFPE, Portland Marriott Downtown Waterfront, Portland, OR, USA, 23-28 October (2011). **The 2011 SFPE Educational and Scientific Foundation Student Scholar Award Lecture**.

16.1.89 Magnone, Z., **Adams, V.,** Han, Z., **Southard, S.,** Su, C., Dembsey, N.A., Morgan, J., and Beaulieu, P.A., "Sprinkler Spray Effects on Combustion Products Leaving a Compartment", Presented at SFPE Professional Development Conference and Exposition, SFPE, Portland Marriott Downtown Waterfront, Portland, OR, USA, 23-28 October (2011).

16.1.90 Dembsey, N.A., "FRP in the International Building Code (IBC)", Presented at Thermoset TOPCON 2012, Society of Plastics Engineers, Thermoset Division, Westin Riverwalk, San Antonio, TX, USA, 24-25 January (2012) **Invited presentation**.

16.1.91 Avila, M., Hao, B., **Fast, N.,** Magnone, Z., **Winsten, R.,** Chu, Y., and Dembsey, N.A., "Droplet Characterization Using Direct Imaging Techniques", Presented at Suppression, Detection and Signaling Research and Applications, a Technical Working Conference, SUPDET 2012, NFPA, Sheraton Crescent Hotel, Phoenix, AZ, 5-8 March (2012).

16.1.92 Dembsey, N.A., "FRP in the International Building Code (IBC)", Presented at Composites 2012, American Composites Manufacturers Association, Mandalay Bay Convention Center, Las Vegas, NV, USA, 21-23 February (2012) **Invited presentation**.

16.1.93 **Park, H.J.,** Meacham, B.J., and Dembsey, N.A., "Increasing Building Fire Safety by Bridging the Gap between Architects and Fire Safety Engineers", Presented at 9th International Conference on Performance-Based Codes and Fire Safety Design Methods, SFPE, The Excelsior Hong Kong, Causeway Bay, Hong Kong, 20-22 June (2012).

16.1.94 Dembsey, N.A., "FRP Design for the 2012 International Building Code (IBC)", Presented at JEC Americas Composites Show and Conferences, Innovative Composites Summit, JEC Composites, Boston Convention and Exhibition Center, Boston, MA, USA, 7-9 November (2012) **Invited Presentation. Invited Chair for the Construction and Building Forum.**

16.1.95 Dembsey, N.A., Stevens, M., Kreysler, W., and **You, Y.G.**, "Exterior Wall Assembly Material Screening Process for NFPA 285", Presented at Composites 2013, The Premier Exhibition and Convention, American Composites Manufacturers Association, Orange County Convention Center, Orlando, FL, USA, 29-31 January February (2013).

16.1.96 **Kim, E.**, Dembsey, N.A., and Shivkumar, S., "Thermo-Physical and Optical Parameter Estimation for Pyrolysis Modeling of Fiberglass Reinforced Polymer Composites", Presented at ANTEC 2013, Society of Plastics Engineers, Duke Energy Convention Center, Cincinnati, Ohio, USA, 22-24 April (2013).

16.1.97 **Kim, E.**, Dembsey, N.A., and Shivkumar, S., "Kinetic Modeling Effects on Pyrolysis Modeling of Fiberglass Reinforced Polymer Composites", Presented at Seventh International Seminar on Fire & Explosion Hazards, ISFEH7, Renaissance Hotel, Providence, RI, USA, 5-10 May (2013).

16.1.98 Dembsey, N.A., "Reaction to Fire Characteristics of Building Materials", ACMA AIA Continuing Education, Course Number ACMA-13-02-04, Presented at ACMA's Corrosion, Mining, and Infrastructure: Digging Down and Building Up with Composites, , Marriott Tech Center, Denver, CO, USA, 15-16 May (2013). **Invited Presentation**.

16.1.99 Dembsey, N.A., Kreysler, W., **Anaya, J., Herrera, R.C., and Morgan, D.**, "FRP Resin and Additive Effects on Fire Performance for Quality Control Planning", Presented at CAMX 2014, the Composites and Advanced Materials Expo, American Composites Manufacturers Association, Orange County Convention Center, Orlando, FL, USA, 13-16 October (2014).

16.1.100 **Park, H.J.**, Meacham, B.J., Dembsey, N.A., and Goulthorpe, M., "Conceptual Model Development to Integrate Fire Safety Performance with Building Design", Presented at the 10th International Conference on Performance-based Codes and Fire Safety Design, University of Queensland, Brisbane, Australia, 12-14 November (2014).

16.1.101 **You, Y.G., Yin, M., Marin, D.,** Meacham, B., Dembsey, N., Gollner, M., Marshall, A., Maisto, P., Ahrens, M., Grant, C., and Rodrigue, T., , "Quantification of Green Building Features on Firefighter Safety: Problem Definition, Data Collection, Preliminary Analysis and Experimental Plan", Presented at the 10th International Conference on Performance-based Codes and Fire Safety Design, University of Queensland, Brisbane, Australia, 12-14 November (2014).

16.1.102 **Kim, M.H.**, Godfrey, T. and Dembsey, N.A., "Numerical Modeling of Vertical Flame Testing of Nylon-Cotton and Flame Resistant Fabrics Used in Army Combat Uniforms", Presented at Fire and Materials 2015, 14th International Conference, Interscience Communications, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 2-4 February (2015).

16.1.103 Dembsey, N.A., **Gillespie, B., Long, M., McMillan, N., Walde, C.**, and Kreysler, W., "Pyrolysis Simulation of Fiber Reinforced Polymer (FRP) Composites: Challenges of Zero-Dimensional Testing of Resin and Additive Mixtures to Measure Kinetic Parameters", Presented at Fire and Materials 2015, 14th International Conference, Interscience Communications, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 2-4 February (2015).

16.1.104 Dembsey, N.A., "(FR313) Composites: Fiber Reinforced Polymers and the IBC", Presented at AIA Convention 2015, Georgia World Congress Center, Atlanta, GA, USA, 14-16 May (2015).

16.1.105 **Martin, D., Yin, M., Figueroa, M.**, Meacham, B.J., Dembsey, N.A., Kim, Y., and Gollner, M., "Fire Performance of Select 'Green' Building Features and Technologies", Presented at SFPE Europe Conference on Fire Safety Engineering, Copenhagen, Denmark, 4-5 June (2015).

16.1.106 Dembsey, N.A., Kreysler, W., and **Anderson, K.**, "Simulation of Micro-scale Fiber Reinforced Polymer Resin and Additive Specimens for Kinetic Modeling", Presented at CAMX 2015, The Composites and Advanced Materials Expo, American Composites Manufacturers Association, Dallas, TX, USA, 26-29 October (2015).

16.1.107 **You, Y.G.**, and Dembsey, N.A., "Discussion of the Potential to Integrate Fire Performance into Multi-objective Optimization routines for Holistic Building Design", Presented at 2015 SFPE North America Conference and Expo: Freedom to Design, Philadelphia, PA, USA, 8-13 November (2015)

16.1.108 Kim, E., Dembsey, N.A., and Godfrey, T., "Parametric Study of Fabric Characteristics' Effect on Vertical Flame Test Performance Using Numerical Modeling", Presented at the Tenth Symposium on Performance of Protective Clothing and Equipment: Risk Reduction Through Research and Testing, San Antonio, TX, USA, 28-29 January (2016).

16.1.109 Dembsey, N.A., "Key International Building Code Requirements for FRP", Presented at Composites Pavilion Educational Sessions, AIA Convention 2016, Philadelphia Convention Center, Philadelphia, PA, USA, 19-21 May (2016).

16.1.110 Dembsey, N.A., Kreysler, W., and **Anderson, K.**, "Simulation of Micro-scale Fiber Reinforced Polymer Resin and Additive Specimens for Kinetic Modeling", Presented at Fire and Materials 2017, 15th International Conference, Interscience Communications, Hyatt Hotel Fisherman's Wharf, San Francisco, CA, USA, 6-8 February (2017).

16.1.111 Carignan, C., Brokaw, F.M., Onash, J., Dodson, R., and Dembsey, N.A., "Gymnastics Training Facilities: Foam Pit Cube Flame Retardant Toxicity and Fire Safety", Presented at NEC SFPE, Four Points Sheraton, Norwood, MA, USA, 6 March (2017).

16.1.112 Carignan, C., Brokaw, F.M., Onash, J., Dodson, R., and Dembsey, N.A., "Gymnastics Training Facilities: Foam Pit Cube Flame Retardant Toxicity and Fire Safety", Presented at Fire Prevention Association of Massachusetts (FPAM) Annual Conference, Southbridge Hotel and Conference Center, Southbridge, MA, USA, 10-11 April (2017).

16.1.113 Dembsey, N.A., and Murphy, C., "Addressing Performance Criteria in Polymeric Composites: Fire Retardancy as a Case Study", Presented at Carbon to Building Symposium, MIT EI, Cambridge, MA, USA, 23 May (2017). **Invited Presentation.**

16.1.114 Carignan, C., Brokaw, F.M., Onash, J., Dodson, R., and Dembsey, N.A., "Gymnastics Training Facilities: Foam Pit Cube Flame Retardant Toxicity and Fire Safety", Presented at SFPE Innovation Series Member Only Webinar, 1 June (2017).

16.1.115 Grant, C., and Dembsey, N.A., "The Unsolved Mystery of the Cocoanut Grove Fire", Presented at NFPA Conference and Expo, Boston Convention and Exhibition Center, Boston, MA, USA, 4-7 June (2017).

16.1.116 Carignan, C.C., Brokaw, F.M., Onasch, J., Stapleton, H.M., Dodson, R., Jazan, E. and Dembsey, N.A., "Reducing Reliance on Flame Retardants in Gymnastics Training Facilities", Presented at 23rd Annual Meeting of the Society of Environmental Toxicology and Chemistry North Atlantic Chapter, University of Massachusetts Conference Center, Amherst, MA, USA, 14-16 June (2017).

16.1.117 Dembsey, N.A., "Small Scale Screening of FRP Systems for Exterior Cladding", Presented at The Future of Composites in Construction, JEC Group, Chicago, IL, USA, 20-22 June (2017).

16.1.118 Dembsey, N.A., "Developing Building Codes and Guidelines: Is Standardization an Attainable Goal?", Panel discussion at The Future of Composites in Construction, JEC Group, Chicago, IL, USA, 20-22 June (2017). **Invited Presentation.**

16.1.119 Dembsey, N.A., Meacham, B.J., Wang, H.G., and Kamath, P., "Sprinkler Trade-offs: Literature Review and Computer Modeling", Project FAIL-SAFE, Presented at NASFM Annual Conference, Francis Marion Hotel, Charleston, SC, USA, 31 July – 3 August (2017).

16.1.120 Dembsey, N.A., "Polymeric Composites: Building Fire Performance Requirements", Presented at Composite Infrastructure and Building Initiative (CIBI), MIT, Cambridge, MA, USA, 8 December (2017).

16.1.121 Hashempour, J., Ranellone, R., Simeoni, S., and Dembsey, N.A., "Designing a Gas Sampling System for a 3 MW Fire Calorimeter Using an Experimental Approach", Presented at Spring Technical Meeting of Eastern States Section of the Combustion Institute, Combustion Institute, State College, Pennsylvania, USA, 4-7 March (2018).

16.1.122 Hansen, R., and Dembsey, N., "The Influence of Fuel Surface Roughness on Ignition in the Mining Industry", Presented at 5th World Congress on Mechanical, Chemical and Material Engineering (MCM'19), Paper No. MMME 102, Lisbon, Portugal, August (2019). [DOI: 10.11159/mmme19.102]

16.1.123 **Wang, H.G.**, and Dembsey, N.A., "Recognition of the Building Performance Gap: Fire", Presented at SFPE 19 Annual Conference and Exposition, Phoenix, AZ, USA, 13-15 October (2019).

16.2 Conference Posters

16.2.1 **Park, H.J.**, Dembsey, N.A., and Meacham, B.J., "Increasing Building Fire Safety by Bridging the Gap between Architects and Fire Safety Engineers", Presented at NFPA Conference and Expo, Boston, MA, USA, 12-15 June (2011).

16.2.2 Magnone, Z., **Accosta, R.**, Dembsey, N.A., and Meacham, B.J., "The Effect of Sprinkler Sprays on the Transport of Toxic Products", Presented at the 10th International Symposium on Fire Safety Science, College Park, Maryland, USA, 19-24 June (2011).

16.2.3 **You, Y.G.**, and Dembsey, N.A., "Characteristics of Nuclear Facility Waste Bag Fires", Presented at Seventh International Seminar on Fire & Explosion Hazards, ISFEH7, Renaissance Hotel, Providence, RI, USA, 5-10 May (2013).

16.2.4 **Wang, H.G.**, and Dembsey, N.A., "Closing the Building Fire Performance Gap", Presented at NFPA 2019 Conference and Exposition, Student Research Poster Board Session, San Antonio, TX, USA, 16 June (2019).

16.3 Other Presentations

16.3.1 Dembsey, N.A., "Using Cone Calorimeter Data and Half-Scale Corner Test Data to Assess the Fire Performance of Composite Materials", Presented at Clark County, Nevada, Department of Building, Educational Seminar Series, Las Vegas, NV, USA, 12 June (2001).

16.3.2 Dembsey, N.A., "Fire Growth Evaluation and Mechanical Properties of Seven Thermoset Composites", and "Marine Composite Material Fire Properties: Implications of Uncertainty", Presented at Akzo Nobel Functional Chemicals LLC, Dobbs Ferry, NY, USA, 6 June 2002.

16.3.3 Dembsey, N.A., "Flammability Characteristics of Materials Under Thermal Insult from Fire", Presented at ASM International Worcester Chapter Meeting, Uxbridge, MA, USA, 17 November 2004.

16.3.4 WPI Grad 2006 Poster: Barter, M., "Effect of Resin Type and Glass Content on Fire Engineering Properties of Typical FRP Composites".

16.3.5 WPI Grad 2006 Poster: Kwon, J.W., "Evaluation of a CFD Fire Model's Capability to Evaluate Flame Spread".

16.3.6 WPI Grad 2006 Poster: Mihyun (Ester) Kim, "A Computational Study on Pulsating in Tunnels with Forced Ventilation". (Major Advisor John Woycheese)

16.3.7 WPI Grad 2007 Poster: Avila, M.B., and Kim, M.H., "Effect of Resin Type and Glass Content on the Reaction to Fire Characteristics of Typical FRP Composites".

16.3.8 WPI Grad 2007 Poster: Brown, J.W., and Jervis, F.X., "Estimating a Critical B-number for Flame Propagation using Experimentally Determined Standoff Distance". (Major Advisor Ali Rangwala).

16.3.9 WPI Grad 2008 Poster: Sipe, J.E., "Heat and Mass Transfer in Porous Media Subjected to Water Spray Cooling".

16.3.10 WPI Grad 2008 Poster: Park, H.J., “Estimation of Thermal and Kinetic Parameters of Pittsburgh Coat Dust Layer from Hot Plate Test”. (Major Advisor Ali Rangwala).

16.3.11 WPI Grad 2009 Poster: Park, H.J., “A Means to Estimate Thermal and Kinetic Parameters of Coal Dust Layer From Hot Surface Ignition Tests”. (Major Advisor Ali Rangwala).

16.3.12 WPI Grad 2009 Poster: Sipe, J.E., “A Model for Heat and Mass Transfer During Sprinkler Wetting of Porous Media”.

16.3.13 WPI Grad 2009 Poster: Kim, M.H., and Lautenberger, C.W., “Property Estimation for Pyrolysis Modeling Applied to PE FRP Composites with Different Glass Contents”.

16.3.14 WPI Grad 2010 Poster: Park, H.J., “Influence of Design Features on Fire Development in a Building”. (Major Advisor Brian Meacham).

16.3.15 WPI Grad 2010 Poster: Schebel, K., “Rail Vehicle Fire Hazard Guidance”. (Major Advisor Brian Meacham).

16.3.16 WPI Grad 2013 Poster: You, Y.G., “Characteristics of Nuclear Facility Waste Bag Fires”.

16.3.17 CEE and FPE Graduate Research Showcase and Competition 2015 Poster: You, Y.G., “Characteristics of Nuclear Facility Waste Bag Fires”.

16.3.18 WPI GRIE 2019 Poster: Wang, H.G., “Closing the Building Fire Performance Gap”.

16.3.19 **Wang, H.G.**, and Dembsey, N.A., “UAV Heat Flux gauge Based on an Infrared Thermometer”, Presented at 1st Asia-Pacific Combustion Institute Summer School, APC1SS, Universidad Técnica Federico Santa María, Chile, November (2019).

17 Other Items

17.1.1 None.

18 Honors, Awards and Recognitions

18.1 Honors and Awards

18.1.1 University of California at Berkeley. Outstanding Graduate Student Instructor, 1988 - 1989.

18.1.2 Society of Fire Protection Engineers. 2000 Hat's Off Award. In recognition of volunteer efforts in support of the development of the SFPE Engineering Guide on skin burns. The award is given to SFPE members who, in the course of their assignments, put forth that extra effort … walk that extra mile … to ensure that the effort expended was the absolute best.

18.1.3 Outstanding Paper Award at *SAMPE 2002* - 2nd Place.

18.1.4 Best Overall Technical Paper Award at *Composites & Polycon 2007*.

18.1.5 Honorable Mention Best Paper 9th International Symposium on Fire Safety Science, Karlsruhe, Germany, 21-26 September (2008).

18.1.6 Best Fire Technical Paper Award at *Composites and Polycon 2009.*

18.1.7 Best Fire Technical Paper Award at *Composites and Polycon 2010.*

18.1.8 Elected to the membership grade of Fellow of the Society of Fire Protection Engineers (2010).

18.1.9 Best Materials Technical Paper Award at *Composites 2013.*

18.1.10 SFPE's 2014 Jack Bono Award. Best JFPE paper for 2013.

19 Memberships and Offices held in Professional Societies

19.1 Memberships

19.1.1 Combustion Institute

19.1.2 International Association for Fire Safety Science

19.1.3 National Fire Protection Association

19.1.4 Society of Fire Protection Engineers

19.2 Society of Fire Protection Engineers

19.2.1 1996 - 2004. Member: Society of Fire Protection Engineers, Engineering Practices Task Group.

19.2.2 1999 - 2007. Chair: Society of Fire Protection Engineers, Room of Origin Fire Hazards Task Group.

19.2.3 2001 - 2002. Member. 2002 - 2006. Chair. Society of Fire Protection Engineers, Publications Committee.

19.2.4 2008 - 2010. Member: Membership Committee.

19.2.5 2010. Elected Fellow.

19.3 American Composites Manufacturers Association

19.3.1 2003 - 2005. Chair: Fire Performance Task Force.

19.3.2 2005 – 2017. Chair: Fire Committee. The Committee explores and evaluates the current fire safety of FRPs and develops supporting information for expanding the use of FRPs in modern building construction.

19.3.3 2007—2011. Chair: International Building Code Working Group. The Group worked on developing , proposing and advocating for changes to the International Building Code that increases the fire safety of FRPs.

19.3.4 2012 – 2017. Vice-Chair and Treasurer: Architecture Division.

19.4 International Association for Fire Safety Science

19.4.1 2008 – 2011. Elected to Governing Committee. 3 year term.

19.4.2 2011 – 2014. Elected to Governing Committee. 3 year term.

20 Editorial, Conference Organization, and Referee Services

20.1 Editorial

20.1.1 2007 – Present. Member: *Fire and Materials* Editorial Board. *Fire and Materials* is the leading refereed journal for publication of literature related to materials and their fire behavior.

20.1.2 1999 – 2020. Member: *Fire Technology* Editorial Board. *Fire Technology* is the refereed journal of the National Fire Protection Association.

20.1.3 2007 – 2009. Member: *Composites Research Journal* Editorial Board. *Composites Research Journal* is the new refereed journal of the American Composites Manufacturers Association.

20.1.4 2011 – 2015. Associate Editor: *Fire Technology* Editorial Board. *Fire Technology* is the refereed journal of the National Fire Protection Association and the Society of Fire Protection Engineers.

20.2 Conference Organization

20.2.1 Member: Program Committee for 2nd International Conference on Fire Research and Engineering, National Institutes of Standards and Technology, Gaithersburg, MD, 10-15 August 1997. (SFPE)

20.2.2 2002 – 2003. Member: Technical Papers Committee. Committee reviews and approves papers for presentation at the annual ACMA *Composites* Conference. (ACMA)

20.2.3 2004 – 2005. Member: Topics and Program Committee for 8th International Symposium on Fire Safety Science, September 2005. Responsible for the Ignition and Flame Spread Section. Managed reviews of approximately 30 papers during December 2004 – February 2005. (IAFSS)

20.2.4 2007 – 2008. Member: Topics and Program Committee for 9th International Symposium on Fire Safety Science, September 2008. Responsible for the Ignition and Flame Spread Section. Managed reviews of 12 papers. (IAFSS)

20.2.5 2008. Co-chaired pre-symposium 9th International Symposium on Fire Safety Science workshop entitled: "Fire Spread Modeling in the CFD Era: the needed fundamentals and engineering concerns". The workshop was attended by 60 plus international fire scientists. (IAFSS)

20.2.6 2008 – 2009. Member: Technical Papers Committee. Committee reviews and approves papers for presentation at the annual ACMA *Composites and Polycon* Conference. (ACMA)

20.2.7 2008 – 2011. Appointed Chair of the Topics and Program Committee for 10th International Symposium on Fire Safety Science, 2011. (IAFSS)

20.2.8 2011 – 2012. Appointed to the Scientific Committee of the International Congress on Fire Computer Modeling, Santander, Spain, 18-19 October 2012.

20.3 Referee Services

20.3.1 1995 - 1996. One paper for *Fire Safety Journal*. One paper for *Journal of Fire Protection Engineering*.

20.3.2 1996 - 1997. Two papers for *Fire Safety Journal*. One paper for *ASTM STP*.

20.3.3 1997 - 1998. Two papers for *Fire Safety Journal*. One paper for *ASTM STP*. One paper for *Fire Technology*.

20.3.4 1998 - 1999. One paper for *ASTM STP*. One paper for *Fire and Materials*.

20.3.5 1999 - 2000. Two papers for 28th International Symposium on Combustion. One paper for *Fire Safety Journal*.

20.3.6 2000 - 2001. One paper for *Fire Technology*. One paper for *Fire Safety Journal.*

20.3.7 2001 - 2002. Three papers for 7th International Symposium on Fire Safety Science. Three papers for 29th International Symposium on Combustion. One paper for *Journal of Fire Protection Engineering*. One paper for *Fire Technology*.

20.3.8 2002 - 2003. One paper for *Fire Safety Journal*. One paper for ASME-JSME Thermal Engineering Joint Conference.

20.3.9 2003 - 2004. Three papers for 30th International Symposium on Combustion. Two papers for *Fire Safety Journal.* Two papers for *Fire and Materials*. Two papers for *Journal of Composites for Construction*.

20.3.10 2004 - 2005. Two papers for *Fire Safety Journal*.

20.3.11 2005 - 2006. Two papers for Fire Technology. One paper for Journal of Composites for Construction. One paper for Fire Safety Journal. Two book Chapters for Transport Phenomena in Fire.

20.3.12 2006. One textbook for Fire Technology. Three papers for *Fire and Materials*. One paper for *Journal of Composites for Construction*.

20.3.13 2007. One paper for 5th International Seminar on Fire and Explosion Hazards. Two papers for *Fire Safety Journal*. One paper for *Journal of Fire Science*. One paper for *Fire Science and Technology*. One chapter for *SFPE Handbook of Fire Protection Engineering*, 4th ed. One paper for *Textile Research Journal*. Twenty-two papers for *Composites Research Journal*.

20.3.14 2008. One paper for *Textile Research Journal*. Three papers for *Fire and Materials*. Two papers for *Building and Environment*. One paper for *Fire Safety Journal*. One paper for *Combustion and Flame*. One paper for *Journal of ASTM International*. Six papers for ACMA Technical Papers Committee for *Composites and Polycon 2009*.

20.3.15 2009. One paper for *Fire and Materials*. One paper for *Journal of ASTM International*. One paper for *Journal of Fire Science*. Three papers for *Fire Technology*. One paper for *Fire Safety Journal*. One paper for *Journal of Fire Protection Engineering*. Two papers for *Journal of Composites in Construction*. One paper for *Building and Environment*.

20.3.16 2010. One paper for *Textile Research Journal*. Two papers for *Fire and Materials*. One paper for *Numerical Heat Transfer*. One paper for *Fire Technology*. One paper for *Journal of Composites for Construction*.

20.3.17 2011. One paper for *Textile Research Journal*. Two papers for *Combustion Science and Technology*. One proposal for Natural Sciences and Engineering Research Council of Canada: CREATE program. One proposal for Natural Sciences and Engineering Research Council of Canada: Research Partnerships Program, Industrial Research Chair Renewal. One proposal for The New Researchers Start-up Program of Fonds de recherché du Quebec – Nature et technologies. Tenure package review for one candidate from Virginia Tech, Mechanical Engineering.

20.3.18 2012. Five papers for *Fire Technology*. One paper for *Fire and Materials*. One paper for *Fire Safety Journal*. One paper Journal of *Fire Protection Engineering*. One book for *Fire Protection Engineering Magazine*. One paper for *Building Research and Information*. Two papers for *9th Asia-Oceania Symposium on Fire Science and Technology*. Two papers for *International Congress on Fire Computer Modeling*. One proposal for Ontario Centres of Excellence.

20.3.19 2013. One paper for *Fire Safety Journal*. One paper for *Combustion and Flame*. One paper for *Journal of Fire Protection Engineering*. Four papers for *11th International Symposium on Fire Safety Science (IAFSS11)*. Three papers for *Fire and Materials*. One paper for *Journal of Architectural Engineering*. Book review of *Fire Safety Engineering Design of Structures*. One paper for *Fire Technology*. One paper for SAE 2014 World Congress – Vehicle Fire Safety Session.

20.3.20 2014. Two papers for *Fire Safety Journal*. Two papers for *Fire and Materials*. Two papers for *Textile Research Journal*. One paper for *Journal of Composites for Construction*. One paper for *Journal of Hazardous Materials*. One paper for *International Journal of Heat and Mass Transfer*. Five papers for *Fire Technology*. One paper for *Journal of Energy Technology and Policy*.

20.3.21 2015. Three papers for *Textile Research Journal*. Four papers for *Fire Technology*. One paper for *Fire Safety Journal*. One paper for *Journal of Engineering*. One paper for *Journal of Composites for Construction*. Three papers for *Journal of Fire Sciences*.

20.3.22 2016. One paper for *Journal of Building Engineering*. Two papers for *Journal of Loss Prevention in the Process Industries*. Three papers for *Fire and Materials*. One paper for *Building Research and Information*. Two papers for *Fire Technology*. One paper for *IAFSS 2017* conference. One paper for *Journal of Fire Sciences*.

20.3.23 2017. One paper for *Fire and Materials*. Two papers for *Fire Technology*. External reviewer for Prof. Zhou promotion application at UNC Charlotte. External reviewer for Prof. Hoskins tenure evaluation at OSU.

20.3.24 2018. Six papers for *Fire Technology*. One paper for the online journal *Polymers*. One paper for *Fuel*.

20.3.25 2019. Four papers for *Fire Technology*. Three papers for *IAFSS 2020* conference. One paper for *Fuel*. One paper for *Fire and Materials*. One paper for *Journal of Fire Sciences*.

20.3.26 2020. Three papers for *Fire Technology*. Two papers for *Fire and Materials*. One paper for *Fire Safety Journal*.

20.3.27 2021. Five papers for *Fire and Materials*.

21 WPI Committee and Administrative Assignment, Department and Campus-wide

21.1 Campus-wide

21.1.1 Served on selection committee for the Board of Trustees' Award for Outstanding Creative Scholarship for 1996.

21.1.2 Served on the Educational Technologies Task Force: sub-committee of the Strategic Planning Steering Committee, Spring 1997.

21.1.3 Served on the Course Management Tools Committee, Summer 1999. Committee charge was to select a software package for course web page creation that would be supported by WPI for campus wide use. The package selected was CourseInfo's Blackboard.

21.1.4 Served on the search committee for an Instructional Designer and Manager, Faculty Support Services, Summer 2000.

21.1.5 Served on the Academic Computer Policy and Working Group subcommittee on Distance Course Delivery, Chaired by Ms. Pamela Shelley, 2009 – 2010.

21.1.6 Solar Decathlon China, 2012. Support project by providing contact information for FRP supplier, FRP materials fire safety expertise (building codes) and fire testing of FRP materials for code compliance.

21.1.7 Solar Decathlon China, 2013. Support project by providing contact information for FRP supplier, FRP materials fire safety expertise (building codes) and fire testing of FRP materials for code compliance. Co-author for a paper on the fire testing submitted to *Fire Technology*.

21.2 Department, Fire Science Laboratory Coordinator

21.2.1 1995 - 2015. Fire Science Laboratory Faculty Coordinator.

21.2.2 Activity on a weekly basis throughout the *entire* year. Staff: Permanent full-time manager and one student employed throughout the year. Responsibilities involve: planning laboratory tours for internal and external groups; planning and conducting demonstration experiments for students and external organizations including the news media; ongoing review/upgrade of safety procedures; maintenance of apparatuses; purchasing of supplies and equipment to maintain laboratory operations; upgrading/redesign of apparatuses; general laboratory clean up, maintenance and upgrading of equipment and facilities; investigating, designing and bring on line new equipment; discussion with potential sponsors regarding service-to-industry contracts; provide technical advice for service-to-industry contracts; provide technical advice to WPI faculty on fire related projects (MQP, MS, PhD) conducted in the laboratory.

21.2.3 2010 – 2015: FPE Fundamentals Lab and Performance Engineering Lab, Gateway II – 50 Prescott Street. Create design. Active participation in design and construction planning process. Oversight of construction. Oversight of commissioning. Oversight of laboratory move from Higgins Labs to GII. Oversight of Engineering Lab LODS G2 system design and construction. **Management of Lufkin Grant $250,000 for LODS G2**.

21.3 Department, Graduate Coordinator

21.3.1 2000 – 2004: FPE Graduate Coordinator. Activity on a weekly basis throughout the *entire* year.

21.4 Department, Other

21.4.1 1999 - 2000: Served on Faculty Search Committee.

21.4.2 2000 - 2001: Interviewed for The History Channel's world television premiere of "Fire at Sea". Shown Fall 2001.

21.4.3 2003 – 2004: Served on Head of Department Search Committee.

21.4.4 2004 – 2005: Provided advice (at the request of Department Head) to adjunct faculty teaching FP 571 Spring 2005 to address concerns of students taking the course and faculty teaching the course.

21.4.5 2005-2006: Served on Faculty Search Committee, Tenure Committee, Doctoral Qualifying Exam Committee (Wrote fire dynamics exam), Doctoral Student Recruiting Committee, and as Faculty Advisor Salamander (Fire Protection Engineering Honor Society).

21.4.6 2006: Served on Faculty Search Committee, Tenure Committee, and as Faculty Advisor Salamander (Fire Protection Engineering Honor Society).

21.4.7 2007: Served on Faculty Search Committee, Tenure Committee, Doctoral Qualifying Exam Committee (Wrote fire dynamics exam), and as Faculty Advisor Salamander (Fire Protection Engineering Honor Society).

21.4.8 2007: Asked by Head of Department to mentor adjunct faculty (5 persons covering 4 courses).

21.4.9 2007: Asked by new faculty (Rangwala and Meacham) to be mentor.

21.4.10 2008: Served on Faculty Search Committee, Tenure Committee (Chair for Rangwala review), Doctoral Qualifying Exam Committee (Wrote fire dynamics exam), and as Faculty Advisor Salamander (Fire Protection Engineering Honor Society).

21.4.11 2008-2008: Served on Strategic Planning Committee. Discussion Leader for degree program and curriculum update.

21.4.12 2008-2008: Asked by new faculty (Rangwala and Meacham) to be mentor.

21.4.13 2009: Served on Faculty Search Committee, Tenure Committee (Rangwala and Meacham review) and Doctoral Qualifying Exam Committee (Wrote fire dynamics exam) as well as chairing committee.

21.4.14 2009: Served on Department of Fire Protection Engineering Strategic Planning Committee. Discussion Leader for degree program and curriculum update.

21.4.15 2009: Informal mentoring of TT faculty (Rangwala and Meacham).

21.4.16 2010: Served on Faculty Search Committee, and Chaired Tenure Committee (Rangwala and Meacham review).

21.4.17 2011: Served on Tenure Committee (Rangwala, Meacham and Simeoni review). Chaired Tenure Committee (Rangwala 6th year review by Joint Tenure Committee). Thermal Fluids Judge for ME/FPE MQPs on Project Presentation Day.

21.4.18 2012: Served on Tenure Committee (Meacham and Simeoni review). Chaired Tenure Committee.

21.4.19 2013: Served on Tenure Committee (Meacham and Simeoni review).

21.4.20 2013: Served on Department Head Search Committee.

21.4.21 2014: Served on Department Head Search Committee and Doctoral Qualifying Exam Committee (Wrote fire dynamics exam) as well as chairing committee.

21.4.22 2014: Nominator for Meacham promotion application to Full Professor

21.4.23 2016: Served as Fire Science Laboratory advisor to Interim FPE Head El-Korchi. Provided extensive advice on completion of fire lab construction and on fire lab operation.

21.4.24 2016: Served on the Search Committee for the new Fire Science Laboratory Post-Doc.

21.4.25 2016: Served as Chair of the Search Committee for the new Fire Science Laboratory Director.

21.4.26 2017: Served on the Search Committee for the new Interim FPE Head Simeoni.

21.4.27 2017: Served as Fire Science Laboratory advisor to Interim FPE Head Simeoni. Provided extensive advice on LODS G2 work.

21.4.28 2018: Served as Fire Science Laboratory advisor to Interim FPE Head Simeoni. Provided extensive advice on LODS G2 work.

21.4.29 2018: Served on the Search Committee for a new Assistant Professor in FPE.

21.4.30 2019: Served on the Search Committee for a new Assistant Professor in FPE.

21.4.31 2019: Served on Doctoral Qualifying Exam Committee (Wrote fire dynamics exam).

21.4.32 2021: Served on FPE Department Scholarship Committee.

22 Non-academic Contributions to Student Welfare

22.1 Student Growth

22.1.1 Take an active interest in individual students' *overall* development by taking time to discuss student needs, concerns and questions. Be proactive regarding student wellbeing by observation and awareness of factors affecting them.

22.1.2 Team member under the direction of Emily Perlow which produced and executed a Student Dorm Room Burn Demonstration on the WPI Quad on 26 September 2007. The event was attended by well in excess of 500 persons and received coverage in the local media.

23 Significant Civic, Cultural, Religious, and Similar Contributions

23.1 Star Island Corporation (non profit)

23.1.1 2007. Appointed to Island Open Late Committee to investigate delayed opening of island conference facility due to fire and building code violations.

23.1.2 2007. Appointed to Safety Committee. 3 year term.

23.1.3 2008. Became a Member of the Corporation.

23.1.4 2008. Appointed to International Affairs Conference Executive Committee. 5 year term.

23.1.5 2008 - 2011. Appointed to Strategic Facilities Planning Committee. 3 year term.

23.1.6 2010 - 2011. Chair of International Affairs Conference for Summer 2011.

23.1.7 2011. Appointed to Strategic Facilities Planning Committee. 3 year term.

23.1.8 2011 - 2012. Chair Emeritus of International Affairs Conference for Summer 2012.

23.1.9 2012. Appointed to the Star Island Corporation Governing Board. 3 year term.

23.1.10 2014. Appointed to the Star Island Corporation Permanent Trust. 3 year term.

23.1.11 2015. Appointed to the Star Island Corporation Governing Board. 3 year term.

23.1.12 2017. Appointed to the Star Island Corporation Permanent Trust. 5 year term.

23.1.13 2018. Appointed to the Star Island Corporation Governing Board. 3 year term.

23.1.14 2018. Appointed to the Star Island Corporation Nominating Committee. 3 year term.

23.1.15 2019. Appointed Star Island Corporation Governing Board President. 1 year term.

23.1.16 2020. Appointed Star Island Corporation Governing Board President. 1 year term.

23.1.17 2021. Appointed to the Star Island Corporation Strategic Facilities Planning Committee. 3 year term. Appointed committee Chair.

23.1.18 2021. Appointed to the Star Island Corporation Nominating Committee. 3 year term.

24 Other Jobs and Experiences

24.1 None.