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Jim Mehaffey, PhD

CURRICULUM VITAE

Jim Mehaffey has been active in the fire research and fire protection communities since 1980. Over the years, he has conducted numerous experimental and theoretical research projects, and has been active in Canadian and international codes and standards committees.

Dr. Mehaffey's research has entailed fire testing of building assemblies in Canada and in Asia; full-scale fire experiments in rooms, furnished houses and apartment buildings; development of mathematical models to predict the growth and severity of fires in buildings; and development of computer models to assess the fire performance of wood-based building assemblies. He has applied the results of this research to reconstruct the course of events in large-loss fires and to assess the fire safety afforded by alternative solutions under objective-based codes.

He has been involved in several initiatives related to the fire safety design of tall wood buildings. He was a co-author of *Chapter 5 Fire Safety and Protection* in *FPIInnovations Technical Guide for the Design and Construction of Tall Wood Buildings*. He was a principal investigator in a Carleton University study in which it was demonstrated how to develop alternative solutions that would ensure the risk to life due to fire in mid- and high-rise buildings of combustible construction was similar to that in code-compliant buildings of non-combustible construction. He was part of the CHM Fire Consultants team that undertook the fire safety design of the Wood Innovation and Design Centre (WIDC) in British Columbia.

Dr. Mehaffey has delivered courses and lectures on fire dynamics at numerous venues. He developed and taught courses at the University of British Columbia (1994-97) and Carleton University (1998-2011). He has spoken on the subject at several short courses directed towards practicing engineers, building officials and fire service personnel. He has also coauthored an engineering educational module entitled *Fire Protection* for the National Institute for Occupational Safety and Health in the USA.

He has supervised or co-supervised numerous fire research projects conducted by post-graduate students at the University of British Columbia and at Carleton University. These projects have covered most subject areas related to fire safety engineering.

Dr. Mehaffey has an international reputation in fire safety science and engineering. He represented Canada in ISO committees developing fire safety engineering standards and technical reports from 1994 to 2008 and was a Vice-Chairman of the International Association for Fire Safety Science from 2004 to 2008. He is also an Associate Editor of the *Journal of Fire Sciences*.

SPECIALIZED EXPERTISE

- Fire Sciences
- Alternative Solutions
- Fire Investigations
- Fire Dynamics
- Third-party Peer Reviews

PROFESSIONAL AFFILIATIONS

International Association for Fire Safety Science (Vice-Chairman 2004-2008)
Journal of Fire Sciences (Associate Editor)
Fire and Materials (Member of Advisory Board)
Member of Canadian Advisory Committee to ISO / TC92 on Fire Safety
Head of Canadian Delegation to ISO/TC92/SC4 Fire-safety Engineering (1993-2008)
Society of Fire Protection Engineers (Ottawa Chapter)

PROFESSIONAL EXPERIENCE

2011 – Present	CHM Fire Consultants Ltd. , Fire Science Research and Engineering Principal
1998 – Present	Carleton University , Fire Safety Engineering Program Adjunct Professor and Lecturer
2005 – 2011	Fire Science Applications Ltd. Principal and Senior Scientist
1988 – 2009	FPInnovations , National Forest Products Research Institute Senior Research Scientist
1993 – 1997	University of British Columbia , Fire Protection Engineering Program Director and Associate Professor (seconded by FPInnovations)
1987 – 1988	Professional Loss Control , Fire Protection Consulting Consultant
1980 – 1987	National Fire Laboratory, National Research Council Canada Senior Research Officer
1978 – 1980	University of Saskatchewan, Department of Chemistry and Chemical Engineering Saskatchewan Research Fellow
1976 – 1978	Michigan State University, Department of Chemistry Research Associate

EDUCATION

1976	Doctorate in Philosophy (PhD) (Physics) University of Toronto, Toronto, Ontario
1972	Master of Science (M.Sc.) (Physics) University of Toronto, Toronto, Ontario
1970	Bachelor of Science (B.Sc.) (Physics) York University, Toronto, Ontario

SELECTED PUBLICATIONS

- 2015 ***Case Studies of Risk-to-Life due to Fire in Mid- and High-Rise, Combustible and Non-combustible Buildings Using CURisk***
Zhang, X., Mehaffey, J.R., and Hadjisophocleous G.
Carleton University Report. Prepared for Forest Innovation Investment, BC.
- 2014 ***Chapter 5: Fire-Safety and Protection***
Harmsworth, A., Dagenais, C., Chen, G., Heikkila, R., Lougheed. G., and Mehaffey, J.R.
Special Publication SP-55; FPInnovations: Technical Guide for the Design and Construction of Tall Wood Buildings in Canada.
- 2014 ***Fire-Safety Design of Tall Wood Buildings***
Dagenais, C., Harmsworth, A., Mehaffey, J.R., Lougheed. G. and Heikkila, R.
Proceedings of the 2014 World Conference on Timber Engineering.
- 2011 ***Predicting Fire Resistance Behaviour of Wood-Steel-Wood Timber Connections***
Peng, L., Hadjisophocleous, G.V., Mehaffey, J.R. and Mohammad M.
Fire Technology, 47, 1101-1119
- 2011 ***Investigation of the Behaviour of CLT Panels Exposed to Fire***
Craft, S.T., Desjardins, R. and Mehaffey, J.R.
Proceedings of the Twelfth International Conference Fire and Materials
- 2011 ***Fire Risk Analysis for Single-family Houses – Validation of CURisk***
Lu, L., Mehaffey, J.R., Hadjisophocleous, G.V. and Mou, X.,
Proceedings of the Twelfth International Conference Fire and Materials
- 2009 ***Fire Loads in Commercial Premises***
Zalok, E.; Hadjisophocleous; G.V. and Mehaffey, J.R.
Fire and Materials, 33, 63-78
- 2008 ***Predicting the Thermal Response of Gypsum Board Subjected to a Constant Heat Flux***
Craft, S.T.; Isgor, B.; Hadjisophocleous, G.V. and Mehaffey, J.R.
Fire and Materials 32, 333-355
- 2008 ***Fire Scenarios***
Hadjisophocleous, G.V. and Mehaffey, J.R.
SFPE Handbook of Fire Protection Engineering 4th Ed. National Fire Protection Assn. Chap 5-11
- 2008 ***Modelling Heat and Mass Transfer in Wood-frame Floor Assemblies Exposed to Fire***
Craft, S.T., Isgor, B., Mehaffey, J.R. and Hadjisophocleous, G.V.
Proceedings of the Ninth International Symposium – Fire Safety Science
- 2007 ***Fire Performance of Wood-based Room Lining Materials***
Mehaffey, J.R., Huczek, J.P. and M.L. Janssens, M.L.
Proceedings of Interflam'2011
- 2007 ***Predicting the Temperature Rise in Light-frame Wood Floor Assemblies Exposed to Fire***
Craft, S.T., Mehaffey, J.R., Hadjisophocleous, G. and Isgor, B.
Proceedings of Interflam'2011

- 2006 ***Predicting the Fire Resistance of Light-Frame Wood Floor Assemblies***
Craft, S., Hadjisophocleous, G., Isgor, B. and Mehaffey, J.
Proceedings of the Fourth International Workshop, Structures in Fire
- 2005 ***Fire Response of Gypsum Board and Wood Framing***
Craft, S., Mehaffey, J., Hadjisophocleous, G., and Isgor, B.
Proceedings of the Eighth International Symposium – Fire Safety Science
- 2005 ***Compressive Strength of Lumber at High Temperatures***
Van Zeeland, I.M., Mehaffey, J.R, and Salinas, J.J
Fire and Materials 29, 71-90
- 2004 ***National and International Fire Protection Regulations and Test Procedures: Canada***
Mehaffey, J.R.
In 3rd Edition of *Plastics Flammability Handbook: Principles, Regulations, Testing, and Approval*
- 2004 ***Analysis of Fire Experiments Conducted in Wood-frame Housing***
Craft, S., Mehaffey, J., Richardson, L.
Proceedings of Wood and Fire Safety Conference, Slovakia.
- 2003 ***Fire Experiments in Furnished Houses***
Mehaffey, J.R., Craft, S.T., Richardson, L.R. and Batista, M.
Proceedings of 4th International Seminar on Fire and Explosion Hazards
- 2000 ***Self-heating and Spontaneous Ignition of Fibreboard Insulating Panels***
Mehaffey, J.R., Richardson, L.R., Batista, M. and Gueorguiev, S.
Fire Technology 36, 226-235
- 1999 ***Performance-based Design for Fire Resistance in Wood-frame Buildings***
Mehaffey, J.R.
Proceedings of *Interflam'99*
- 1999 ***An Assessment of the Impact of Seismic Effects on Fire Safety of Buildings***
Robertson, J.N. and Mehaffey, J.R.
Proceedings of *Interflam'99*
- 1999 ***A Forensic Analysis of a Montreal Building Fire***
Senez, P.L and Mehaffey, J.R.
3rd International Conference on Fire Research and Engineering
- 1998 ***WALL2D: A Model for Predicting Heat Transfer through Wood-stud Walls Exposed to Fire***
Takeda, H. and Mehaffey, J.R
Fire and Materials 22, 133-140
- 1998 ***Fire Protection***
Mehaffey, J.R. and Bert, J.L.
An Engineering Educational Module, National Institute for Occupational Safety and Health, USA, 65p.
- 1997 ***Modelling the Fire Resistance of Wood-Frame Buildings***
Lin, E.C.Y and Mehaffey, J.R.
Journal of Fire Sciences 15, 308-338

- 1994 ***Risk of Conflagration Involving Wood Buildings after an Earthquake***
Mehaffey, J.R. and Richardson, L.R.
Proceedings of *Firesafety Frontier '94*
- 1994 ***A Model for Predicting Heat Transfer through Gypsum-Board / Wood-Stud Walls Exposed to Fire***
Mehaffey, J.R.; Cuerrier, P. and Carisse, G.
Fire and Materials 18, 297-305
- 1992 ***Full-Scale Fire Tests for Ship Accommodation Quarters***
Steward, F.R.; Morrison, L. and Mehaffey, J.R.
Fire Technology, 28, 31-47
- 1991 ***Fire Resistance Requirements for Rubber-Tire Warehouses***
Yung, D. and Mehaffey, J.R.
Fire Technology 27, 100-112
- 1987 ***Fire Performance of Combustible Insulation in Buildings***
Mehaffey, J.R.
Journal of Thermal Insulation 10, 256-269
- 1987 ***The Normalized Heat Load Concept and its Use***
Harmathy, T.Z. and Mehaffey, J.R.
Fire Safety Journal 12, 75-81
- 1986 ***Heat Transmission in Fire Test Furnaces***
Sultan, M.A.; Harmathy, T.Z. and Mehaffey, J.R.
Fire and Materials 10, 47-55
- 1985 ***Thermal Response of Compartment Boundaries to Fire***
Mehaffey, J.R. and Harmathy, T.Z. 1985
Fire Safety Science - Proceedings of First International Symposium
- 1985 ***Design of Buildings for Prescribed Levels of Structural Fire Safety***
Harmathy, T.Z. and Mehaffey, J.R.
Fire Safety: Science and Engineering, ASTM STP 882, ASTM, Philadelphia, pp. 160-175
- 1984 ***Failure Probabilities of Constructions Designed for Fire Resistance***
Mehaffey, J.R. and Harmathy, T.Z.
Fire and Materials 8, 96-104
- 1983 ***Post-Flashover Compartment Fires***
Harmathy, T.Z. and Mehaffey, J.R.
Fire and Materials 7, 49-61
- 1982 ***Normalized Heat Load: A Key Parameter in Fire Safety Design***
Harmathy, T.Z. and Mehaffey, J.R.
Fire and Materials 6, 27-31
- 1981 ***Assessment of Fire Resistance Requirements***
Mehaffey, J.R. and Harmathy, T.Z.
Fire Technology 17, 221-37