

LOUIS (LOU) A. GRITZO

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EDUCATION

Ph. D., Mechanical Engineering, Minor: Applied Mathematics, Texas Tech University, 1992.
M. S., Mechanical Engineering, Texas Tech University, 1990.
B. S., Mechanical Engineering, Texas Tech University, 1988. Highest Ranking Graduate

PROFESSIONAL EXPERIENCE

1/06 – Pres. **Vice President, Research**, FM Global, Norwood, MA

Leads fundamental and applied research conducted by scientists, engineers and technologists for the world's largest high hazard industrial and commercial property insurance company. Provides leadership to Research Technical Directors related to engineering sciences, risk assessment, risk reduction and resilience, and advanced analytics in all risk-related areas including natural hazards (wind, flood, earthquake), fire and explosion hazards, security-related (terrorism, cyber and other) threats, response and protection of structures, equipment reliability, human element issues, and failure prevention techniques. Responsibilities also include direct reports that manage FM Global's \$250-million, 1,600 acre, Research Campus, the world's largest center focused on loss prevention research and testing (including certification testing for FM Approvals), as well as the Norwood, MA R&D office/lab that includes 14 small scale scientific laboratories and large-scale (2000+ processor 70+ teraflop) scientific computing facilities. As of 2016, also assumed responsibility for **International Codes and Standards**, a group of staff and collaborators dedicated to affecting policy to improve resilience in emerging economies including India, China, Brazil (and elsewhere in Latin America), and across the EU. As of 2019, assumed Building Administrator responsibility for the Norwood, MA, Engineering and Research office and labs as well as the FM Global **Technical Information Center**, the archives of the over 180 year old company. Currently leading the digital transformation of the organization to educate the next generation and provide more timely and portable information across global engineering and operations.

FM Global Corporate Spokesperson

Thought leadership on technical, educational, and business issues in international, national, and regional media. Recent, significant interviews include:

- CBS Morning News (https://www.cbs.com/shows/cbs_this_morning/video/9zhtxv8_aJzoWd5S87Y79U5KWPz9qJm/insurance-risk-lab-creates-disaster-environments-to-help-protect-businesses/)
- The New York Times (<https://www.nytimes.com/2017/12/11/climate/test-climate-disasters-risk.html>) and (<https://www.nytimes.com/2017/12/11/insider/disaster-lab-research.html>)
- NPR Here and Now (<https://www.wbur.org/hereandnow/2018/07/03/hurricane-storm-insurance-simulation>)
- The Economist (podcast released soon after) (<https://www.economist.com/business/2019/02/23/business-and-the-effects-of-global-warming>)

Interviews include *Wall Street Journal*, *Business Week*, *Discovery Channel*, *Reuters*, *Bloomberg*, *Fast Company*, *Business Insurance*, *Risk and Insurance*, *Human Resources Executive* and other technical and business publications. A frequent keynote speaker. Invited panelist at two sessions of the 2015 **United Nations World Conference on Disaster Risk Reduction** in Sendai, Japan.

6/01 – 12/05 Manager, Fire Science and Technology, Engineering Sciences Center, **Sandia National Laboratories**, Albuquerque, NM

Program and customer development for all fire and safety related topics related to national security and safety. Management responsibility for a department of engineers and technologists providing research, development and application solutions using computational and experimental science and technology to support DOE, DOD, DOT, NTSB, NASA, NRC, and private industry. Includes direction of a large-scale field test and research facility for open and enclosed fires, construction of 36\$ million thermal research laboratory, and completion of FUEGO version 1.0, a massively parallel CFD fire field model.

10/00 – 6/01 Special Appointment, **Advanced Concepts Group**, Sandia National Laboratories.

Direct report to Vice President and Laboratory Principle Scientist Gerold Yonas. Worked with a small team of interdisciplinary lab staff and management to develop, support, and promote strategy and new concepts and initiatives throughout Sandia. Activities focused on complex system failure and safety analysis, new approaches for surety analysis, the study of global (and space) security and safety issues, and the ability to attract new talent. Lead studies for a national emergency response architecture, and the development of advanced, wearable technologies for personal awareness, situational awareness, and advanced decision making for first responders and warfighters.

- 9/96 – 10/01 Principal Member of Technical Staff, Reactive Processes, Engineering Sciences Center, Sandia National Laboratories.
- Research, development, and applications work in numerical and experimental heat transfer, fluid mechanics, and reacting flow technology including basic research, technology development, program development and project management. Numerical modeling and theoretical research activities included the development of radiative transfer analysis techniques compatible with gridless vortex methods, the application of CFD-based fire field models, the conceptualization and development of improved physical submodels for fire models, and the development of simplified engineering models for risk assessment, survivability analyses and design studies. Experimental research and development included large scale experiment design and coordination, the development of diagnostic techniques including advanced optical methods.
- 1/96 – 9/96 Senior Member of Technical Staff, Unsteady & Reactive Fluid Mechanics Dept. 9116, Engineering Sciences Center, Sandia National Laboratories.
- 7/92 – 01/96 Senior Member of Technical Staff, Fluid and Thermal Engineering Dept. 1513, Engineering Sciences Center, Sandia National Laboratories.
- 9/91-7/92 Instructor of Mechanical Engineering, Texas Tech University.
- 9/88-9/91 NSF Creativity Award Research Assistant, Texas Tech University.
- 6/88-9/88 Energy Management Engineer, State of Texas.
- Summers Structural Test Engineer, Los Alamos National Laboratory/Nevada Test Site.
85-88

SELECTED ACTIVITIES

Organizational Leadership

UNISDR (now UNDRR) ARISE Disaster Risk Reduction Organization, 2018-Present

ABET Industrial Advisory Council, 2020 -

Innovation Research Interchange (previously the Industrial Research Institute, re-branded under my tenure as Chairman)

- Chairman, Board of Directors, 2017-2018, Past Chairman, 2018-2019
- Board of Directors, 2014-2019.
- Chair, “Research on Research” Leadership Team, 2011-2014
- Co-Chair, R&D Leadership Skills and Styles Project, 2009-2011

Global Earthquake Model (a Private/Public/Academic Partnership) Governing Board, 2010-2017, Sustainability (Executive Leadership) Committee, 2015-2017. Passed along to Direct Report.

Western University WindEEE Research Institute Advisory Board, 2015-2016, Passed along to Direct Report.

International FORUM of Fire Research Directors, 2002-2016, Passed along to Direct Report.

American Society of Mechanical Engineering

- Heat Transfer Division Executive Committee, 2006-2012, Chair 2010-2011
- Nanotechnology Council, 2008-2013
- Chairman, K-11 Committee on Fire and Combustion Systems, 2001-2004

National Fire Protection Association,

- Property Insurance Research Group, 2010-present
- Fire Protection Research Foundation Research Advisory Board, 2006-2011

Insurance Institute for Business and Home Safety – Research Advisory Board, 2008-2012

Academic Advisory Boards

Florida International University, Extreme Events Institute Advisory Board, 2019-Present

Texas Tech University – Dean’s Council, Edward Whitacre College of Engineering (2009-present as emeritus), Mechanical Engineering Industrial Advisory Board (2004 – 2013)

Worcester Polytechnic Institute – Dean’s Engineering Advisory Council (2012 - present), Fire Protection Engineering Board of Advisors (2006 – 2012)

University of Maryland – Fire Protection Engineering Board of Visitors (2007 – 2015), Chair from 2013-2015

Northeastern University Mechanical and Industrial Engineering Advisory Board (2014 – present)

Patents

Gritzo, et al., US 9805588B2, “Wireless fire protection valve inspection and monitoring systems, and methods for automated inspection and monitoring of fire protection systems” granted 10/31/2017.

Recent Events/Keynote Speeches

5th Global Summit on Process Safety, Center for Chemical Process Safety, Singapore, October 2019

SELECTED HONORS

National Security

- Sandia Defense Programs Award for Excellence, 2005
- NASA Administrator's Award (Joint with FAA and NASA-Glenn), 2005
- Sandia President's Quality Award, 2004
- Sandia President's Award for Meritorious Achievement, 2002
- Sandia Award for Exceptional Service, 2002

Academic Achievement

- Texas Tech Distinguished Engineer, 2014
- Texas Tech Academy of Mechanical Engineers, 2001
- Outstanding Student Instructor of the Year, 1991-1992
- National Science Foundation Creativity Award, 1988-1991
- Highest Ranking Graduate College of Engineering, 1988

Community Service

- KNME (Public Television) Community Advisory Board, Past Chair.
- Volunteer for Hockomock YMCA and King Phillip Regional High School
- Massachusetts Beach Buggy Association
- Adirondack Mountain Club

PUBLICATIONS

Refereed/Journal Papers

Gritz, L.A., Fusfeld, A., and Carpenter, D., "Success Factors in R&D Leadership", *Research-Technology Management*, Vol. 60, Issue 4, pp. 43-52, 2017. (***Research-Technology Management most downloaded article in 2017/2018/2019***)

Gritz, L.A., Fusfeld, A., and Carpenter, D., "Exploring the Principles of R&D Leadership with Award-Winning R&D Winners" Research Notes, *Research-Technology Management*, Vol. 60, Issue 3, pp. 18-21, 2017.

Gritz, L.A. "What Every New Ph.D. Should Know" Point of View, *Research-Technology Management*, July-August 2014.

Krause, U., Grosshandler, W.L., and Gritz, L. "The International FORUM of Fire Research Directors: A Position Paper on Sustainability and Fire Safety" *Fire Safety Journal*, Vol. 49, April, 2012.

Carpenter, D.J., Fusfeld, A., and Gritz, L. "Leadership Skills and Styles" *Research-Technology*

Management, Vol. 53, Issue 6, pp. 58-60, 2010.

Gritzso, L.A., Bill, R.G., Wieczorek, C., and Ditch, B “Environmental Impact of Automatic Fire Sprinklers: part 1. Residential Sprinklers Revisited in the Age of Sustainability” *Fire Technology*, Vol. 47, no. 3, pp 751-763, 2010

Suo-Anttila, J. and Gritzso, L. “The Effects of Wind on Fire Environments Containing Large Cylinders” *Combustion Science and Technology*, Vol. 181, No. 1, pp. 68-77, 2009.

Tieszen, S.R. and Gritzso, L.A. “Transport Phenomena that Affect Heat Transfer in Fully Turbulent Fires” *Transport Phenomena in Large Fires*”, Sunden and Faghri Eds, pp. 25-68, WT Press, 2008.

Croce, P.A., Grosshandler, W.L., Bukowski, R.W., Gritzso, L.A. “The International FORUM of Fire Research Directors: A Position Paper on Performance-Based Design for Fire Code Applications, Journal” *Fire Safety Journal*, Vol. 43, No. 3, 2008.

Hightower, M., Gritzso, L.A., Luketa-Hanlin, A. “Safety Implications of a Large LNG Tanker Spill Over Water” *Process Safety Progress*, pp. 168-174, 2005.

Gritzso, L.A., Senseny, P.E., Xin, Y., and Thomas, J.R. “The International FORUM of Fire Research Directors: A Position Paper on Verification and Validation of Numerical Fire Models” *Fire Safety Journal*, Vol. 40, No. 5, pp. 485-490, 2005

Suo-Antilla, J., Gill, W., Gritzso, L. and Blake, D. “An Evaluation of Actual and Simulated Smoke Properties” *Fire and Materials*, Vol. 29, pp. 91-107, 2005.

Zhu, J, Irrera, A., Choi, M.Y., Mulholland, G.W., Suo-Anttila, J., and Gritzso, L. A. “Measurement of Light Extinction Constant of JP-8 Soot in the Visible and Near-Infrared Spectrum” *International Journal of Heat and Mass Transfer*, Vol. 47, No. 17-19, pp. 3643-3648, 2004.

Editor, ASTM Special Publication 1427, *Thermal Measurements: The Foundation of Fire Standards*, 2003. ASTM, West Conshohocken, PA.

Zhu, J., Choi, M.Y., Mulholland, G., and Gritzso, L. A. “Measurement of Soot Optical Properties in the Near-Infrared Spectrum” *International Journal of Heat and Mass Transfer*, Vol. 43, No. 18, pp. 3299-3303, 2000.

Zhu, J., Choi, M.Y., Mulholland, G.W., and Gritzso, L.A. “Soot Scattering Measurements in the Visible and Near-Infrared Spectrum” *Twenty Eighth Symposium (International) on Combustion*, The Combustion Institute, 2000.

Gritzso, L.A. and Strickland, J. “A Gridless Solution of the Radiative Transfer Equation for Fire and Combustion Calculations” *Combustion Theory and Modeling* Vol. 3, No. 1, pages 159-175, March 1999.

Tashtoush, G., Saito, K., Cremers, C., and Gritzo, L.A. "Study of Flame Spread Over JP8 Using 2-D Holographic Interferometry" *Journal of Fire Sciences*, Vol. 16, 437-457, 1998.

Williams, J. and Gritzo, L.A. "In-Situ Sampling and Transmission Electron Microscope Analysis of Soot in the Flame Zone of Large Pool Fires" *Twenty Seventh Symposium (International) on Combustion*, The Combustion Institute, pp. 2707-2714, 1998.

Gritzo, L.A., Sivathanu, Y. R., and Gill, W. "Transient Measurements of Radiative Properties, Soot Volume Fraction and Soot Temperature in a Large Pool Fire" *Combust. Sci. and Tech.* Vol. 139, 1-6, p. 113, 1998.

Gritzo, L.A., Gill, W., and Nicolette, V.F. "Estimates of the Extent and Character of the Oxygen-Starved Interior in Large Pool Fires" *Very Large Scale Fires, ASTM STP 1336*, N.R. Keltner, N.J. Alvares and S.J. Grayson, Eds., American Society for Testing and Materials, 1998.

Gritzo, L.A., and Nicolette, V.F. "Coupling of Large Fire Phenomenon with Object Geometry and Object Thermal Response" *Journal of Fire Sciences*, Vol. 15, 427-442, 1997.

Sorathia, U., Lyon, R., Gann, R.G., and Gritzo, L. "Materials and Fire Threat" *Fire Technology*, 33:3, 260-276, 1997.

Koski, J.A., Gritzo, L.A., Kent, L.A., and Wix, S.D. "Actively Cooled Calorimeter Measurements and Environment Characterization in a Large Pool Fire" *Fire and Materials*, Vol 20, 69-78, 1996.

Gritzo, L.A., and Nicolette, V.F. "Coupled Thermal Response of Objects and Participating Media in Fires and Large Combustion Systems" *Numerical Heat Transfer, Part A*, 28:531-545, 1995.

Li, W., Tong, T., Dobranich, D. and Gritzo, L.A. "A Combined Narrow- and Wide-Band Model for Computing the Spectral Absorption Coefficient of CO₂, CO, H₂O, CH₄, C₂H₂, and NO" *J. Quant. Spectrosc. Radiat. Transfer*, 54:6, 961-970, 1995.

Gritzo, L.A., Nicolette, V.F., Tieszen, S.R., and Moya, J.L. "Heat Transfer to the Fuel Surface in Large Pool Fires" *Transport Phenomenon in Combustion*, S.H. Chan, ed., Taylor and Francis, 1995.

Gritzo, L.A., and Anderson, E.E. "Laser Heating of an Absorbing and Conducting Media Applied to Laser Flash Property Measurements" *Thermal Conductivity 22*, T.W. Tong, ed., Technomic, 1994.

Gritzo, L. A., Fernandez, M.L. and Anderson, E.E. "Force Analysis of a Laser Beam Incident on a Fluid Jet" *Applied Optics*, Vol. 29, No. 18, 1990.

Other Articles, White Papers, and Unlimited Release Reports and Theses

Book Reviews (Research-Technology Management):

- *The Mind of the Leader: How to Lead Yourself, Your People, and Your Organization for Extraordinary Results*, Rasmus Hougaard and Jacqueline Carter, Volume 61. Issue 6, November-December 2018.
- *Thank You for Being Late: An Optimist's Guide to Thriving in the Age of Accelerations*, Thomas L. Friedman, Volume 61. Issue 4, July-August 2018
- *Radical Candor: Be a Kick-Ass Boss Without Losing Your Humanity*, Kim Scott, Volume 60. Issue 5, September-October 2017.

Innovation C-Scape. Innovating for Risk Management: Lou Gritzto *Research-Technology Management*, Vol. 60, Issue 4, p. 64, 2017.

Coping with Extremes: The Impact of Climate Change on Extreme Precipitation and Flooding”, FM Global Report, 2016.

www.fmglobal.com/riskessentials/2016/business-impact-of-climate-change

Bosman, R., Gritzto, L.A., Kunreuther, H., Pretty, D., Timmons, S., and Topf, M “Flirting with Natural Disasters: Why Companies Risk it All”, FM Global Report, 2010.

www.fmglobal.com/disaster

Gritzto, L.A., Doerr, W., Bill, R., Ali, H, Nong, S., and Krasner, L. “The Influence of Risk Factors on Sustainable Development” FM Global Research Technical Report, 2010.

www.fmglobal.com/researchreports

Hightower, M., Luketa-Hanlin, A, Gritzto, L, and Covan, J. “Review of the Independent Risk Assessment of the Proposed Cabrillo Liquefied Natural Gas Deepwater Port Project,” Sandia National Laboratories, Sand Report SAND2005-7739, 2006.

Hightower, M., Gritzto, L. Luketa-Hanlin, A., Covan, J., Tieszen, S., Wellman, G., Irwin, M., Kanashige, M., Melof, B., Morrow, C., and Ragland, D. “Guidance on Risk Analysis and Safety Implications of a Large Liquefied Natural Gas (LNG) Spill over Water” SAND Report 2004-6258, Sandia National Laboratories, Albuquerque, NM., 2004.

Burkle, F.M., Gritzto, L.A., Hinds, R. M., Hirano, H.H., Leiner, F., Merkle, P. Murch, R., Raybourn, E.M., and Sandin, T. “Recommendations for a Notional National Emergency Response Architecture” Sandia National Laboratories, Albuquerque, NM., 2002.

Desjardin, P.E. and Gritzto, L.A. “A Dilute Spray Model for Fire Simulations: Formulations, Usage and Benchmark Problems” SAND 2002-3419, Sandia National Laboratories, Albuquerque, NM., 2002.

Ottesen, D., Gritzto, L.A., Allendorf, S.W., Shaddix, C.R. and Hubbard, G. “Diode Laser Diagnostics for Gas Species and Soot in large Pool Fires: LDRD Project Final Report” SAND 2001-8383, Sandia National Laboratories, Albuquerque, NM., 2001.

Suo-Antilla, J.M., and Gritzo, L.A. "Thermal Measurements from a Series of Tests with a Large Cylindrical Calorimeter on the Leeward Edge of a JP-8 Pool Fire in Cross-Flow" SAND 2001-1986, Sandia National Laboratories, Albuquerque, NM., 2001.

Suo-Antilla, J.M., and Gritzo, L.A., "Thermal Measurements for a JP-8 Pool Fire in Cross Flow with a C141 Fuselage Located on the Leeward Edge" SAND 2001-0313, Sandia National Laboratories, Albuquerque, NM., 2001.

Lopez, A.R., Gritzo, L.A., Gutierrez, W.T., and Budd, L., "Characterization of Damage Hole Effects on the Flow Field in Aircraft Dry Bays and Nacelles" JTCG/AS 00-V-001, SAND 2000-1926, Sandia National Laboratories, Albuquerque, NM., 2000.

Gritzo, L. A., Strickland, J. H., and DesJardin, P. E., "Radiation in an Emitting and Absorbing Medium: A Gridless Approach" SAND2000-0960, Sandia National Laboratories, Albuquerque, NM., 2000.

Tanaka, T., Baynes, E.E., Nowlen, S.P. Brockmann, J.E., Gritzo, L.A., and Shaddix, C.R. "LDRD Report: Smoke Effects on Electrical Equipment" SAND2000-0599, Sandia National Laboratories, Albuquerque, NM., 2000.

Lopez, A.R., Gritzo, L.A., and Sherman, M.P. "Risk Assessment Compatible Fire Models (RACFM)" SAND 97-1562, Sandia National Laboratories, Albuquerque, NM., 1997.

Gritzo, L.A. and Moya, J.L. "Fire Characterization and Object Thermal Response for a Series of Tests with a Large Flat Plate Adjacent to Large JP-4 Fuel Fire" SAND 97-0047, Sandia National Laboratories, Albuquerque, NM., 1997.

Tieszen, S.R., Nicolette, V.F. Gritzo, L.A., Holen, J.K., Murray, D., and Moya, J.L. "Vortical Structures in Pool Fires: Observation, Speculation, and Simulation" SAND 96-2607, Sandia National Laboratories, Albuquerque, NM., 1996.

Gritzo, L.A., Skocypec, R.D. and Tong, T.W. "The Use of High-Performance Computing to Solve Participating Media Radiative Heat Transfer Problems - Results of an NSF Workshop" SAND Report 95-0225, Sandia National Laboratories, Albuquerque, NM., 1995.

Gritzo, L.A. "Liquid Jet Instability" Ph. D. Thesis, Texas Tech University, 1992.

Gritzo, L.A. "Laser-Induced Break-Up of a Liquid Jet" M.S. Thesis, Texas Tech University, 1990.

Conference Paper References Available Upon Request