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The 14th edition of the Accident Prevention Manual for Business & Industry: Administration & Programs continues a tradition begun in 1946 with the publication of the first Accident Prevention Manual. This Manual brings to the safety/health/environmental professional the broad spectrum of topics, specific hazards, best practices, control procedures, resources, and sources of help known in the field today. To accommodate the expansion of knowledge and topics, the Manuals are now printed in five volumes: Administration & Programs (14th edition), Engineering & Technology (14th edition), Environmental Management (3rd edition), Security Management (2nd edition), and Accident Prevention Manual Essentials (1st edition).

This 14th edition builds on the excellent work of previous contributors to the National Safety Council’s flagship series. Volunteer experts from many different subject areas have come together to make this book an important resource to be used in support of safety programs and related education. In addition to the expertise of National Safety Council volunteers and staff, we have received expert assistance in developing, writing, and reviewing from contributors representing various disciplines and from the editors, Philip E. Hagan, John F. Montgomery, and James T. O’Reilly. If you have different ideas and want them to be considered for the 15th edition, your suggestions are welcome and can be sent to the National Safety Council, 1121 Spring Lake Drive, Itasca, IL 60143, attn. Deborah Meyer or deborah.meyer@nsc.org.

The audience served by this textbook is widespread. Safety professionals with years of experience, individuals new to the field, managers tasked with safety responsibilities, and educators preparing students for careers in the field of safety will find that these volumes are a valuable source of information. Those who work in the fields of risk management and loss control, human resources, and engineering will also find programs and information that can be incorporated successfully into working goals and objectives that will add value to any organization’s safety program.

NEW AND REVISED MATERIAL

The Accident Prevention Manuals are intended for a wide range of users: for students using them as textbooks, for corporate or company managers searching for solutions to safety and health problems, for new safety specialists who must plan and organize a safety and health program within a company, or for experienced safety professionals seeking to improve an operating program and to learn more about advances in the field of safety and health. To increase their usefulness, the 14th editions of the Administration & Programs volume and the Engineering & Technology volume contain new chapters as well as completely revised material in all chapters.

All chapters in both volumes were reviewed, revised, and updated by safety professionals with expertise in the specific subject area. In addition to a new layout and two-column design of the textbook, major changes include:

**Administration & Programs volume:**
- Chapter 3: Safety Culture—updated and expanded
- Chapter 5: Legal and Regulatory Issues for the Safety Manager—extensively rewritten
- Chapter 11: Injury and Illness Record Keeping, Incidence Rates, and Analysis—new data and analysis added
- Chapter 14: Environmental Management—extensively rewritten
- Chapter 19: Workplace Violence—updated and expanded
- Chapter 21: Industrial Sanitation and Personnel Facilities—updated and moved from Engineering & Technology volume
- Chapter 22: Occupational Medical Surveillance—updated and moved from Engineering & Technology volume
- Chapter 23: Workers with Disabilities—updated and moved from Engineering & Technology volume
- Chapter 25: Transportation Safety—extensively rewritten
- Chapter 29: Homeland Security Compliance in the Workplace—updated and expanded
- Chapter 30: Motivation—extensively rewritten
- Chapter 31: Safety and Health Training—extensively rewritten
- Chapter 32: Media—extensively rewritten

**Engineering & Technology volume:**
- Chapter 6: Safeguarding—updated and expanded
- Chapter 11: Nanomaterials in the Workplace—updated and expanded
- Chapter 19: Welding and Cutting—extensively rewritten
- Chapter 21: Working with Hot and Cold Metals—updated and combines two metals chapters into one
- Chapter 24: Process Safety Management—updated and moved from Administration & Programs volume
DEFINITIONS OF TERMS

As the concerns and responsibilities of safety/health/environmental professionals expand, so must their ability to communicate and educate. Technical terms are defined in the text where they are used and also in Appendix 3, Glossary, in the Engineering & Technology volume. However, the terms incident and accident deserve a special note. In the years since the original publication of this manual, many theories of accident causation and definitions of the term accident have been advanced. The National Safety Council continues to work to increase awareness that an incident is a near-accident and that so-called accidents are not random events but rather preventable events. To that end, the term incident is used in its broadest sense to include incidents that may lead to property damage, work injuries, or both. The following definitions are generally used in this manual:

• **Accident**: That occurrence in a sequence of events that produces unintended injury, death, or property damage. Accident refers to the event, not the result of the event (see unintentional injury).

• **Incident**: An unintentional event that may cause personal harm or other damage. In the United States, OSHA specifies that incidents of a certain severity be recorded.

• **Near-miss incident**: For purposes of internal reporting, some employers choose to classify as “incidents” the near-miss incident; an injury requiring first aid; the newly discovered unsafe condition; fires of any size; or nontrivial incidents of damage to equipment, building, property, or product.

• **Unintentional injury**: The preferred term for accidental injury in the public health community. It refers to the result of an accident.

With proper hazard identification and evaluation, management commitment and support, preventive and corrective procedures, monitoring, evaluation, and training, unwanted events can be prevented.

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Thank you for taking the time to consider and utilize some of these ideas. Of course, none of the book’s comments take the place of legal advice, medical advice, or professional advice. Please be certain to discuss the contents of this text with the appropriate professional advisers. We do not offer this as a substitute for the timely, prudent expertise of your organization’s regular advisers.

CONTRIBUTORS

The following safety, health, and environmental professionals have contributed to the 14th editions as editors, writers, and/or reviewers of chapters or sections. The National Safety Council very much appreciates the dedication and professional expertise they have contributed to the cause of safety, health, and environmental education.

**Alan Barr**, co-founder of ErgoMek, LLC, has been a Development Engineer for the UCB/UCSF Ergonomics Program since 2001. He has extensive knowledge in design, CAD modeling, and fabrication of mechanical interventions designed to reduce injury in the workplace. He received a BS in Biomechanics and an MS in Biomedical Engineering from the University of California at Davis in 2000.

**Stephen Bennett**, ARM, is co-founder of a web-based membership cooperative that brings together a network of independent safety and health consultants, providing a wide range of safety, loss prevention, regulatory management,
industrial hygiene, workers’ compensation, and return-to-work solutions to public and private employers. Previously, Bennett has held regional to global consulting leadership positions at Sedgwick CMS; Marsh, Johnson & Higgins; and The Travelers. E-mail: smbennett54@sbcglobal.net.

Jairo Betancourt, has more than 25 years of experience in biomedical research and laboratory safety. His experiences include designing, implementing and managing laboratory safety programs for universities and research institutions both domestically and internationally.

He is an active member of the American Biological Safety Association (ABSA). Currently he is involved in the International Working Biosafety Group (IBWG, www.internationalbiosafety.org), the ABSA Philanthropy task force, and co-editor of the Biosafety Compendium. He frequently conducts education and training programs on biosafety and biosecurity in Spain and Latin American countries throughout Central and South America (Colombia, Mexico, Dominican Republic, Venezuela, and Argentina).

Stephen Blackwell, MS, REHS, is an environmental health consultant retired from the U.S. Public Health Service Commissioned Corps. He has extensive experience in the environmental health field with the cruise ship industry, Centers for Disease Control, the Indian Health Service, the U.S. Coast Guard, and the Agency for Toxic Substances and Disease Registry, a federal public health agency of the U.S. Department of Health and Human Services. He has a BS from East Carolina University and an MPH from Florida International University. E-mail: srb0@comcast.net.

Janice Comer Bradley, MS, CSP, is Senior Vice President, National Waste & Recycling Association, where she manages the program group addressing safety, ANSI standards, technical issues, statistics, and education for the waste and recycling industry. She is also the past Vice President of the International Safety Equipment Association, where she managed the activities of Fortune 500 companies involved in supplying safety and health equipment and services. Prior to her work at ISEA, she was the director of environmental health and safety for the Rockefeller University in New York City, the university health and safety officer for Brown University, and the safety specialist for the Department of Veterans Affairs Medical Center in Dayton, Ohio. Bradley is a member of the National Academy of Science, Institute of Medicine, and Research Programs Board on Health Sciences Policy, and she lectures at Georgetown University. She earned a BS from the University of Dayton and a master’s degree in environmental studies from Brown University. E-mail: jcbmarch@yahoo.com.

Thomas Bush is a safety professional with close to 30 years of extensive experience in the transportation, manufacturing, insurance, training, aviation, ground handling, and construction industries. He has worked as an Incident Commander on numerous emergency response projects and as a Project Manager for large environmental remediation projects in North America. Bush has been a Professional Member of the American Society of Safety Engineers for the past 28 years. Tom is an Instructor for the Texas A&M University Engineering Extension Service.

Salvatore Caccavale, CHMM, CPEA, is Corporate Senior Manager Environmental, Health and Safety at A.M. Castle & Co., 3400 North Wolf Road, Franklin Park, Illinois 60131, (847) 349-2601.

Denis Clark, MS, PE, is a consulting Welding Engineer. He holds a BS from Cornell University and an MS from The Ohio State University, has a PE license in Metallurgical and Materials Engineering from the State of Idaho, and is an AWS Certified Welding Inspector. He has worked in the welding area for 40 years—most of that time at the Idaho National Laboratory. His areas of research have included welding process sensing and control, spray forming, cupola furnace control, the weldability of new alloys, and the application of standard AWS and ASME codes to the welding of nuclear components. Clark is an adjunct professor at Montana Tech University in Butte and has also taught as an adjunct professor at the University of Idaho. He is currently Chair of the AWS Safety and Health Committee. E-mail: denis.clark.51@gmail.com or www.deklar-engineering.com.

Robert Wayne Clifton, CSP, PE, ALCM, CPCU, CIE, is presently working as the Global AVP for ESIS Inc. In his current role, he manages a staff of safety professionals in the United States, United Kingdom, Singapore, China, and Malaysia. Clifton has more than 37 years of experience as a safety consultant. He holds a master’s degree in safety and health. E-mail: wayne.clifton@esis.com.

Patrick J. Conroy, OHST, CHST, is Special Assistant to the Board of Directors Council on Certification of Health, Environmental and Safety Technologists, 208 Burwash Avenue, Savoy, IL 61874-9571, Office (239) 599-8907. E-mail: pat@cchest.org.

John DeLaHunt, MBA, ARM, has managed environmental, health, safety, and risk issues in higher education since 1989. At Colorado College, he launched a comprehensive EHS program. At the University of Texas at San Antonio,
he manages property insurance, workers’ compensation, property conservation, and fire protection while serving as the university’s Fire Marshal and Risk Manager.

DeLaHunt writes a bimonthly column for the *Journal of Chemical Health & Safety*, edited both editions of the *Environmental Compliance Assistance Guide for Colleges & Universities*, and has presented on diverse topics at dozens of conferences. He has been published in the *Journal of Chemical Health and Safety* and the Association of Higher Education Facilities Officer’s Body of Knowledge. He was the charter President of the College and University Hazardous Waste Conference. He serves on the University Risk and Insurance Management Association’s government relations and affairs committee and the editorial board for the *Journal of Chemical Health and Safety*.

DeLaHunt holds a bachelor’s degree in Chemistry from Colorado College and an MBA in Finance and Management from the University of Colorado–Colorado Springs. E-mail: john_delahunt@msn.com.

Jane Dolezal is the Safety and Compliance Manager for Homewood Disposal Service. She has more than 20 years of combined experience in both the regulatory and waste and the recycling sectors involving the implementation and management of DOT, EPA, and OSHA compliance programs. She is a member of several ANSI committees and has a BS in Environmental and Natural Resources Policy and Studies from Michigan State University.

J. Nigel Ellis, PhD, PE, CSP, CPE, can be contacted at Ellis Fall Safety Solutions, 306 Country Club Drive, Wilmington, DE 19803. E-mail: www.Fall-Safety.com or efss@fallsafety.com.

Michael J. Fagel, PhD, CEM, has more than three decades of public service. He has been in fire service, emergency medical service, public health, law enforcement, and emergency management, as well as corporate safety, security, and threat risk management. Fagel is currently an instructor at the University of Chicago in its new Masters of Threat Risk Management program. He is also an instructor for Benedictine University’s Masters in Public Health Program, as well as an instructor at Eastern Kentucky University in its Loss Prevention Masters Program. He was a team leader at the Louisiana State University’s National Center for Bio Medical Research and training in its Response to Agricultural Terrorism Training program, as well as its Public Health Programs in Response to High Consequence Events. Fagel has delivered more than 350 lectures and has written more than 100 articles on safety and disaster planning. He has published two textbooks on safety and disaster management and was on the National Domestic Preparedness Office SLAG team at the FBI.

Fagel spent 10 years with the Federal Emergency Management Association in its Occupational Safety & Health Cadre, responding to incidents and disasters such as the Oklahoma City bombing, where he worked as a safety officer and CISD Debriefer. He has also consulted on terrorism-related issues at home and abroad. Fagel can be reached at PO Box 211, Sugar Grove, IL 60554, (630) 907-2020. E-mail: mjfagel@aol.com.

Cristine Z. Fargo has held the position of Manager, Standards Programs for the International Safety Equipment Association for close to 20 years. She manages the voluntary standards setting activities of 13 product groups representing manufacturers and suppliers of safety and health equipment. She represents the ISEA on numerous industry standards committees and works with federal regulatory agencies and outside standards bodies to influence activities that affect the manufacture, use, and distribution of safety equipment. In addition, Fargo speaks at various industry functions about ISEA and its role in the safety equipment business. She holds a degree in Political Science from West Virginia University and can be reached at the ISEA, (703) 525-1695. E-mail: cfargo@safetyequipment.org.

Dave Felinski, Safety Director, Association of Manufacturing Technology, 7901 Westpark Drive, McLean, VA 22102, (703) 893-2900. E-mail: www.amtonline.org.

Anne M. Germain, PE, BCEE, has been the Director of Waste & Recycling Technology for the National Waste & Recycling Association since September 2013. Prior to that, she was the Chief of Engineering and Technology for the Delaware Solid Waste Authority. In addition, she is a Past President of the Solid Waste Association of North America. She has written more than 20 papers and has presented nationally and internationally on solid waste matters. Germain is a Professional Engineer and a Board Certified Environmental Engineer. She has been active in ABET, evaluating environmental engineering programs for accreditation. She graduated from Virginia Tech with a BS in Civil Engineering and received her master’s, also in Civil Engineering, from the University of Delaware. E-mail: amgermain@wasterecycling.org.

Teddy Gil, BME, MBA, ASNT Level III ET, FAA A&P License, has held varying positions throughout his career. Most recently, he has served as Process Improvement & Engineering Consultant for Delta Air Lines, implementing executive leadership for short fuse interior configura-
tion upgrades and fabrication; Vice President of Business Development & Quality for Global Integrated Security Services, providing risk assessment consulting and training; and Vice President of People Development and Training for Air Serv Corporation. He also led the Delta Air Lines Technical Operations Employee Council responsible for implementing positive improvement and positive cultural changes throughout the organization for the more than 12,000 Technical Operations employees. Gil was also the presiding officer of the Conflict Resolution Program from 2002 to 2004 for Delta Air Lines Technical Operations. In addition, Gil has published extensively, including several book chapters for the National Safety Council.

Allen Gilley, CIH, CSP, ARM, ALCM, is a Managing Consultant in the Marsh Insurance Company’s Atlanta, Georgia, office. He is responsible for the coordination and delivery of professional loss-control services to his clients, which include a wide variety of manufacturers, broadcast and print media, public entities, health care providers, contractors, restaurants, distributors, property management firms, and service organizations. Gilley is manager of the Atlanta Workforce Strategies Group, practice leader of the Southern Regional Workforce Strategies Group, and national Safety and Health practice leader. He also serves as the chairman of the Marsh Atlanta Restaurant Roundtable and chairman of the Marsh Newspaper/Media Risk Control Roundtable. He is also the MRC Practice Leader for Hospitality/Restaurants. E-mail: allen.m.gilley@marsh.com.

Von M. Griggs-Laws has 28 years of experience as a safety professional with practical, hands-on occupational safety and health experience in such areas as aircraft maintenance, medical facilities, transportation, civil engineering, communications, supply/warehousing, petroleum distribution, food services, retail, and other industrial and administrative functions. Griggs-Laws is certified as an OSHA Instructor—General Industry & Construction Safety, Oil & Gas, and is a Certified Safety & Health Official/CSHO Texas A&M; a Certified Government Environmental Specialist/World Safety Organization; a Safety Trained Supervisor/SCHEST; a Drug & Alcohol Defensive Driving Instructor/National Safety Council; a Construction Engineering Concepts/Turner Construction Instructor; and a Work Zone Trainer/MUTCD and TxDOT. She is an Adjunct Instructor in Health & Safety for Texas A&M University, Texas Engineer Extension Service (TEEX).

William Grimes, CSP, is currently the Vice President of Safety and Security for CitationShares, a division of Cessna Aircraft Company that provides fractional jet service. Grimes is a CSP with more than 25 years of safety and health experience and also holds an FAA Airline Transport Pilot rating and type ratings in the Citation 550 and Citation 560 Excel aircraft. Prior to CitationShares, Grimes worked for TAG Aviation and Marsh Risk Consulting as a managing director. He was recognized by the Flight Safety Foundation with the President’s Safety Citation award in 2007. E-mail: wgrimes@citationshares.com.

Richard J. Hackman, CIH, QEP, is Associate Director at The Procter & Gamble Co. Hackman has been with P&G for 28 years. He directs the P&G North America Regulatory and Technical Relations organization, which is responsible for regulatory compliance, regulatory/legislative influence, and technical external relations activities across all products and operations in the region. Hackman has a BS in Biology from the University of Cincinnati, an MS in Environmental Sciences from the University of Cincinnati, and an MBA in Finance from Xavier University. He is certified by the American Board of Industrial Hygiene in Comprehensive Practice, as well as by the Institute of Professional Environmental Practice as a Qualified Environmental Professional. E-mail: hackman.rj@pg.com.

Philip E. Hagan, JD, MBA, MPH, ARM, CIH, CHMM, CHCM, CET, CHSP, CEM, is Assistant Professor in the Department of Human Sciences at Georgetown University, Washington DC, and National Practice Leader for Partner Engineering and Science. In addition, he is a practicing attorney specializing in tort, safety, environmental, and business-
related law issues. He is the former Director of Safety & Environmental Management at Georgetown University. He has consulted internationally on risk, safety, environmental, and emergency management issues in Italy, Qatar, India, Turkey, and China. Hagan has co-authored texts on environmental and workplace safety, legal liability, training, and indoor environmental quality; and he has been a general editor for the Accident Prevention Manual for Business & Industry for three editions. He was also the lead editor on the new Accident Prevention Manual Essentials (2014). In addition, he has presented to a diverse group of audiences on subjects ranging from hazardous waste disposal to business continuity and emergency management. He is a member of several American Bar Association committees dealing with environmental issues in business transactions, toxic torts, workers’ compensation, and international environmental law. He has been a peer reviewer for various safety-related ANSI consensus standards and guidelines. He holds a BS from East Carolina University in Environmental Health, an MPH from George Washington University, an MBA from Georgetown University, and a JD from the George Mason University School of Law. E-mail: haganp@georgetown.edu.

Valenti Antonio Henry, MBA, is board certified in safety and a Certified Lean-Six Sigma Black Belt. Currently, he is a senior manager of Loss Prevention and Reduction at the University of Miami. In addition, Henry also maintains a consulting practice in both the private and public sectors, which includes the development of loss control and risk management programs using specialized Lean-Six Sigma methodologies to maximize efficiency and decrease costs for diverse clients in the health care and financial sectors. He has an MBA in International Business and Finance from the University of Miami. E-mail: vhenry@miami.edu.

David Hibbard, MPH, CIH, is the Director of Environmental Health & Safety at the University of Kentucky. He has more than 25 years of combined experience in the military, regulatory, chemical manufacturing, and higher-education sectors involving the implementation and management of health and safety and industrial hygiene programs. He holds a BS from East Carolina University and a master’s in Public Health from Eastern Kentucky University. E-mail: dwhibb0@uky.edu.

Gary A. Higbee, EMBA, CSP, is President/CEO of Higbee & Associates Inc., a full-service international consulting firm. Higbee has more than 40 years of experience in the safety field and is an international expert in industrial and construction safety. He can be reached at (515) 270-6623. E-mail: g.higbee@mchsi.com.

Richard Hislop, PE, CSP, is a Chicago resident and Management Consultant focusing on safety program development and implementation of work planning and control processes for construction projects and operating facilities. E-mail: richard.hislop@gmail.com.

Dwight Hyche, Vice President Senior Boiler, Machinery & Equipment, of the Marsh Risk Consulting Practice Group, serves as a Boiler, Machinery & Equipment Risk Consultant for the Southeast Region of Marsh USA. In this capacity, Hyche specializes in servicing pulp and paper clients, electric utilities, food processors, and other clients with large investments in machinery and equipment assets. He also reviews and coordinates insurance carrier inspection services, provides guidance on recommended risk improvements and plant ratings, and assists in determining marketing strategies. In addition, Hyche performs boiler and machinery risk assessments, loss control inspections, and marketing reports where these services are needed. E-mail: dwight.hyche@marsh.com.

Wendy R. Keys, BS, MS, CS, is certified by the Board of Certification in Professional Ergonomics. Fifteen years ago, she established Ergonomics Engineering Consultants, providing ergonomic and safety services to the chemical, food processing, and manufacturing industries. Keys has been an Instructor for the Texas A&M University Engineering Extension Service since 2007, specializing in Ergonomics and Process Safety Management. Prior to EEC, Keys was employed by Neutral Posture Ergonomics, providing ergonomic consultation to NPE customers nationwide. She also spent 5 years at the corporate headquarters of El Paso Energy as a Senior Safety Engineer. Her primary responsibility with El Paso Energy included office and field ergonomics, process safety management, hearing conservation, asbestos and lead management, OSHA injury reporting, case management, incident statistics, and corporate safety auditing for construction and operational sites. She earned a BS in Industrial Engineering in 1992 and an MS in Industrial Engineering in 1994 at Texas A&M University.

Ken Kolosh directs the National Safety Council statistical reporting and statistical estimating systems. Kolosh leads the development of Injury Facts, an annual NSC statistical report on unintentional injuries, their characteristics, and costs. Prior to joining NSC, Kolosh worked in the corporate e-learning industry. He served as advanced strategy and systems consultant with Element K and managing consultant with NETg’s strategic services team. He was also senior researcher for NETg’s research and development group.
Kolosh holds a BA from DePauw University and an MA from Western Kentucky University. He is on the editorial board of the NSC’s *Journal of Safety Research*. E-mail: ken.kolosh@nsc.org.

**John Kurtz**, International Staple, Nail and Tool Association, 512 West Burlington Avenue, Suite 203, La Grange, IL 60525-2245. E-mail: isanta@ameritech.net.

**Jim E. Lapping**, MS, PE, has more than 30 years of construction industry experience with 20 years as an administrator of the National Safety and Health Education and Training Program. His responsibilities included representation before congressional committees and regulatory agencies on safety, health, and environmental issues. Other accomplishments include development, implementation, and evaluation of more than 40 cooperative safety programs for major construction projects. Lapping has also held positions as Senior Advisor to Assistant Secretary of OSHA, Washington DC, and vice president and safety director of a major construction company.

**James Larson**, JD, MBA, PE, has a long history of providing consulting services to both internal and external customers. As a student of the Theory of Constraints, Larson has used root cause problem solving to tackle many substantial and pressing issues in the business, construction, manufacturing, educational, and energy industries. He has worked for such notable names as Booz Allen Hamilton, Intel Corporation, Georgetown University, and the U.S. Department of Veterans Affairs. Larson is a licensed professional engineer and attorney, and holds an MBA from Georgetown University.

**Curt L. Lewis**, PE, CSP, is the President/Owner of Curt Lewis & Associates LLC, a consulting firm specializing in aviation/airline safety, accident investigation and reconstruction, industrial safety, forensic investigation, product safety, system safety, automotive crash worthiness, railroad crossing collision investigations and reconstruction, and airport and aircraft security. He worked for American Airlines/AMR Corporation for 17 years as the Corporate Manager System Safety and previously as the Corporate Manager of Flight Safety and Flight Operational Quality Assurance for American Airlines. Currently, he is an Adjunct Assistant Professor of Occupational Safety & Health at Southeastern Oklahoma State University and an Adjunct Assistant Professor with Embry-Riddle Aeronautical University, teaching aviation, system, human factors, and industrial safety courses (Outstanding Faculty Award—2003). E-mail: curt@curt-lewis.com.

**Bob LoMastro** is a former Army Green Beret, Navy Hospital Corpsman, and Supervisor of the National Safety Council’s Safety Training Institute. He holds a master’s degree in Safety Management & Engineering and several bachelor’s degrees. LoMastro developed his unique, interactive teaching style as an instructor at the Naval School of Health Sciences. As President of LoMastro & Associates Inc., he draws on a career spanning more than 30 years of teaching health- and safety-related topics worldwide for the military, general industry, and construction companies.

**Patrick Lorimer**, BS, MPH, has more than 20 years of experience in the Health and Safety industry and is currently the Director of Operations for the EH&S practice Partner Engineering & Science, a large, national environmental engineering firm. Lorimer has worked as a Corporate Risk Manager for a large regional health system and has presented many professional seminars in the field of health safety and environmental hygiene on topics ranging from indoor air quality and risk management to environmental management systems. He holds a BS from East Carolina University and an MPH from George Washington University. E-mail: plorimer@partneresi.com.

**Steven L. Lubetkin**, APR, Fellow, PRSA, is managing partner of Lubetkin Communications LLC, a strategic communications consulting firm in Cherry Hill, New Jersey. His background includes nearly 30 years in senior corporate communications positions with Fortune 100 companies in transportation, technology, and financial services. E-mail: steve@lubetkin.net.

**Brian Maitland**, CSP, CET, is a Technical Director in Partner Engineering and Science Inc.’s Health, Safety & Environmental Hygiene discipline. He currently performs regulatory compliance services for public and private entities. His areas of expertise include loss prevention safety audits, accident investigations, job safety observations, and education and training on regulatory compliance issues standards. He has a BS in Environmental Science and Public Health from East Carolina University.

**David E. Marquette**, CSP, is the owner of SafeMarq Risk Advisors LLC. He has 40 years of consulting experience in a broad spectrum of risk control topics, including occupational safety, ergonomics, product safety and liability prevention, business continuity plans, and property loss prevention. He has consulted with industrial manufacturers of all types, major airlines, railroads, wholesalers and retailers, and heavy-highway and commercial building contractors. He specializes in aviation ground safety, behavior-
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based safety, ergonomics, and safety management systems. Marquette is a respected lecturer and regularly presents papers at national and international safety conferences. He was co-editor and contributor to the *Aviation Ground Operations Safety Handbook, 6th edition*, published by the National Safety Council in 2007.

James D. Mayers II, JD, is a Georgia- and DC-barred attorney who earned his JD from Mercer University. His undergraduate concentration was in biology while at Harvard. He has worked as a legal editor as well as clerked for the Macon Circuit Public Defenders’ Office.


Bradley A. McPherson, MS, CSP, is a Certified Safety Professional and has worked for Allegheny Energy as a Safety and Health Consultant for 9 years. He has a master’s degree in Occupational Hygiene and Safety from West Virginia University and a bachelor’s degree in Safety Engineering Technology from Fairmont State University. He can be reached at Route 4 Box 695C, Fairmont, WV 26554.

Bill Montante, CSP, is Vice President and Senior Consultant in casualty hazard control, serving Marsh US and global clients. He has more than 25 years of manufacturing, safety management, ergonomics, and consulting experience. He has written numerous articles and received awards for technical writing excellence. He served as Ergonomics Practice Leader and continues active involvement with this practice group as well as other specialty technical task groups within and external to Marsh Risk Consulting. He has a BSE in Industrial Engineering and Human Factors from the State University of New York and holds several certifications.

John F. Montgomery, PhD, CSP, CHMM, is the Senior Vice President of ES&H for Air Serv Corp, with responsibility for 54 domestic and international stations, and is an Instructor for the Texas A&M University Engineering Extension Program. Prior to joining Air Serv, he was with American Airlines for 18 years, where he served as the Corporate Manager of Ground Safety, Corporate Manager/Acting Managing Director of the Environmental Department, and the Manager of the Noise and Emissions Regulatory Program. Prior to joining American, he was the Corporate Manager of Safety and Lost Time at Sky Chefs, spent time in the industrial sector, and was an Assistant Professor/Lecturer at several universities, including Texas A&M, University of Central Missouri, Central Oklahoma University, and Lamar University.

Montgomery holds three advanced degrees, including a PhD in Philosophy from Texas A&M University, and has two Professional Certifications: Certified Safety Professional (Safety) and Certified Hazardous Material Manager (Environmental). He is a frequent speaker at industry meetings and seminars, was an editorial advisor to *Safety and Health Magazine*, and was the General Editor for the 1997, 2001, and 2009 two-volume *Accident Prevention Manual for Business & Industry*, published by the National Safety Council. He was also a contributor to the *Accident Prevention Manual for Environmental Management* (1995 and 2000) and the first edition of *Accident Prevention Manual Essentials* (2014). He was named Rapporteur of the International Air Transportation Association Emissions Sub Group and served as a delegate to the United Nations’ International Civil Aviation Organization. He was a contributor/reviewer for the United Nations’ Intergovernmental Panel on Climate Change’s review of the effect of aircraft emissions on the environment. E-mail: drjfmonty@sbcglobal.net.

Patrick Moylan, MBA, CSP, is the Senior Director of Safety and Security at BBA Aviation’s flight support businesses, Signature Flight Support and Aircraft Service International Group—two leading ground service providers to the global commercial airline and business aviation sectors. In this capacity, he is responsible for the design and implementation of the company’s Safety Management System and for nurturing a positive safety culture in its 200+ airport locations around the world.

Prior to his current position, Moylan served as a safety management consultant at the Federal Aviation Administration’s Office of System Safety and the Global Aviation Information Network, an international aviation safety program promoting the collection, analysis, and sharing of aviation safety information. His professional experience also includes positions in airline flight operations, in general aviation operations management, and as an air traffic controller in the U.S. Marine Corps. He has served as an adjunct faculty member at the University of Maryland Eastern Shore and the Community College of Baltimore County, teaching courses in aviation safety, airport management, and air traffic control. Moylan earned his BA and MBA from Michigan State. E-mail: patrick.moylan@bbaaviation.com.

Michael O’Berry, MEd, has 35 years of industrial, fire, and oil field safety experience and is currently the Program Chair of Occupational Safety Engineering and Environmental Management at Eastern New Mexico University. He also is a Senior Training Specialist at the OSHA Training Institute Southwest Education Center.
and is on staff at the Texas Engineering Extension Service within the Texas A&M University System and is an Adjunct Instructor in the New Mexico Junior College System. His expertise includes oil field and natural gas training and emerging alternative energy field sources.

O’Berry hold several degrees, including an AAS from Trinidad State Junior College, Colorado; a BS in Safety and Occupational Education from Wayland Baptist University, Plainview, Texas; and an MEd, in Curriculum Development and Instruction: Technology Integration, from Grand Canyon University, Phoenix, Arizona.

James T. O’Reilly, JD, College of Law and College of Medicine, University of Cincinnati, Cincinnati, Ohio, has authored 45 texts and 200 articles. His scholarly work was acknowledged in a March 2000 decision of the U.S. Supreme Court, quoting one of his textbooks as the “expert” in its field. He was formerly Associate General Counsel of The Procter & Gamble Company and Chair of the Local Emergency Planning Committee for Cincinnati and has served as chair of the American Bar Association’s Section of Administrative Law, 1996–1997. He also served as vice mayor of an Ohio city and as a member of the regional council of governments. He has acted as a general editor for both volumes of the Accident Prevention Manual for Business & Industry for three editions in addition to the new Essentials text produced in 2014. E-mail: joreilly@fuse.net.

Richard Payant, BS, MA, CFM, CPE, CHS, has more than 20 years of experience as Director of Facilities Management at Georgetown University and more than 23 years of experience with the Army Corps of Engineers. He is a Certified Facility Manager and Plant Engineer and holds a certification in Homeland Security. Payant is also an Adjunct Professor teaching Facilities Management at George Mason University. He is the author of several professional publications and co-authored the Facility Inspection Field Manual, the Facility Manager’s Emergency Preparedness Handbook, and the Facility Manager’s Maintenance Handbook, 3rd and 4th editions. He holds a BS from Norwich University, an MA from Central Michigan University, and a PhD in Business Administration from Northcentral University. E-mail: rich.payant@gmail.com.

Richard Pifer, BS, MS, is currently a consultant in facilities management. He is the past Associate Vice President for Facilities and Services at the University of Rochester and was in that position from 1999 to 2014. Prior to assuming his role at the University of Rochester, he worked for more than 9 years in the Georgetown University Facilities Department, holding a variety of positions in Facilities Management Administration. He was a career military officer, has a graduate degree in management, and is active on a variety of university and community boards and committees.

Antonello Pileggi, MD, PhD, is a Research Professor at the Division of Cellular Transplantation of the DeWitt-Daughtry Family Department of Surgery and at the Departments of Microbiology and Immunology and Biomedical Engineering at the University of Miami. Since 2003, he directs the Preclinical Cell Processing and Translational Models Program at the Cell Transplant Center of the Diabetes Research Institute. His research has been funded through the National Institutes of Health, Juvenile Diabetes Research Foundation, the Diabetes Research Institute Foundation, and the University of Miami, as well as by other industries. He has lectured at national and international institutions and professional meetings.

Pileggi has served as ad hoc Reviewer and/or Study Section Member for the National Institutes of Health; the Italian Republic’s Ministry of Health; American Diabetes Association; Czech Science Foundation; Regenerative Medicine Research Committee, Medical Research Council, United Kingdom Diabetes UK; and the Biomedical Research Council & National Medical Research Council, Singapore; among other national and international agencies. Pileggi has authored 20 scientific book chapters and more than 150 peer-reviewed publications in the fields of organ and cellular transplantation, immunobiology, and regenerative medicine.

Joy Prescott, MS, is Manager of Training at Texas A&M Engineering Extension Service, Infrastructure Training and Safety Institute and OSHA Training Institute Education Center. She has more than 30 years of experience in the Safety and Health profession. Prescott has served several large corporations directing both national and global safety, health, environmental, and medical programs over her tenure as well as actively participating in many professional organizations. For the past 2 years, her efforts have centered on giving back her industry knowledge through her work at the OSHA Training Institute Education Center.

Cynthia Roth, RN, has been a professional in the ergonomics, safety, and health industry since 1987. In 1993, she co-founded Ergonomic Technologies Corp. Prior to ETC, Roth was Executive Vice President of Biomechanics Corporation of America and the Senior Vice President and Business Manager for the Langer Biomechanics Group. She has lectured on Ergonomics/Biomechanics/Safety and Health to Fortune 500 companies, to Fortune 200
international companies, and at universities and colleges around the world. She is a Trustee and past Chairperson of the American Society of Safety Engineers Foundation Board. With extensive international experience, she has also been appointed a permanent member of New York State’s Commission on International Trade and is on the Advisory Boards of the NYC Department of Mental Health and Hygiene, the Ergonomics Exposition, and the publications of Occupational Hazards and CTDNews. Roth serves on many national committees and is very well published, with articles appearing worldwide. She received a degree from the University of Pittsburgh as a professional registered nurse with specialties in Occupational Nursing and Biomechanics. E-mail: Gcroth@ergoworld.com.

Steven G. Schoolcraft, PE, CSP, MBA, is the Examination Director for the Board of Certified Safety Professionals and has served in this role since 2002. Prior to joining the board staff, he worked for the American Bureau of Shipping, where he worked closely with the Coast Guard and other components of the U.S. government and government contractors in areas such as risk management and safety engineering. His undergraduate degree is in chemical engineering from Texas A&M University, and he joined NASA’s Goddard Space Flight Center after college. Schoolcraft left NASA in 1997 and joined the American Bureau of Shipping. He is a Certified Safety Professional and a licensed professional engineer in several states. He has also earned an MBA and has been in a management role in the safety profession for more than 15 years.

Bonnie Martin Steward is the founder and owner of Martin Safety Consulting, a 10-year-old ES&H consultant company. She has been an Environmental Health and Safety Professional for 30 years and has worked in a number of companies: Adjunct Instructor in Health & Safety faculty for Texas A&M University, Texas Engineer Extension Service; External Reviewer for ISNetworld; Environmental Health & Safety Engineer, Reckitt Benckiser Pharmaceutical Manufacturer, Fort Worth, Texas; Campus Safety Trainer and Training Coordinator, The University of Texas at Arlington; Safety/Environmental Manager, Paragon Trade Brands; Instructor—Occupational Safety & Health Program, Texas State Technical College; Safety Engineer, LTV Aerospace and Defense; Safety Technician, United Technologies; and Safety Technician, M&M Mars Candy. She holds certifications as an OSHA 500 Trainer; Medic First Aid Certified—Train the Trainer; and First Aid/AED/CPR for Adult, Youth, and Infants; and is a Certified NIOSH Defensive Driving Instructor.

Ralph Stuart, MS, CIH, CCHO, is Chemical Hygiene Officer at Keene State College in Keene, NH. He has an MS from the University of Vermont in Environmental Engineering and has been active at the national level in laboratory safety innovations since 1989. These innovations include development of professional health and safety Internet information resources, as well as the EPA Project XL regulatory reinvention project for laboratory chemical waste management. He is currently secretary of the Division of Chemical Health and Safety of the American Chemical Society and chair of the ACS Safety Advisory Panel. E-mail: rstuartcih@me.com.

Patricia L. Thomas, CSP, CHMM, CET, is a Certified Safety Professional, Certified Hazmat Manager, Certified Environmental Safety and Health Trainer, and the founder and CEO of a small specialty consulting firm which provides safety, industrial hygiene, fire protection, and emergency response services, training, and consulting to a variety of industrial, municipal and construction clients. Thomas has responded as the Site Safety Officer to large hazardous material spills on the waterways including the BP Gulf Oil Spill. She has developed and presented a number of specialty courses on loss control including regulatory industrial training classes and safety and health manuals for clients.

Thomas has served at the corporate level as a consultant to five refining facilities in addition to working in several refineries and chemical plants, has provided technical expertise and consultation on refinery/chemical plant safety issues, writing safety procedures, conducting training, and emergency response. She has provided liaison services to OSHA and insurance inspectors/auditors, conducted design reviews, and has consulted on new construction projects. She also has experience directing activities for implementation of the Process Safety Management Standard.

Thomas has dual Bachelor of Science degrees from Oklahoma State University in Fire Protection and Safety Engineering Technology and Business Administration. She has spent 30 years as a master instructor at Texas A&M Industrial Fire School and has been a part-time instructor for the Southwest OSHA Education Training Center for 14 years. She is a member of NFPA, a Professional Member of ASSE, and an Associate Member of the Ft. Worth and Dallas County IEC chapters. She is also an advisory board member to the Environmental Safety and Health Program at Tarrant County Community College, and a member of the National Safety Committee for Independent Electrical Contractors.

Treasa Turnbeaugh, PhD, MBA, CSP, CET, is the Chief Executive Officer for the Board of Certified Safety Professionals. She is responsible for the overall operations
of the BCSP as well as its contribution to the safety, health, and environmental profession. Turnbeaugh is experienced in the safety, health, and environmental field and in the field of professional certification. Additionally, she brings experience and leadership in the business arena of both for-profit and not-for-profit organizations.

Turnbeaugh has more than 25 years of experience in the safety profession, with experience in workers’ compensation cost reduction, ergonomics, industrial hygiene, indoor air quality, behavior-based safety, cultural assessments, diagnostics and metrics, injury management, and safety process improvement. She is experienced in servicing a variety of industries, including manufacturing, health care, gaming, higher education, agribusiness, and municipalities.

Turnbeaugh holds a PhD in Health Services Research, with a minor in Epidemiology, and an MPH from Saint Louis University; an MBA from Lindenwood University; and both an MS and BS in Occupational Safety and Health, with a specialization in Industrial Hygiene, from Murray State University. She is a member of the American Society of Safety Engineers, the American Industrial Hygiene Association, and the American Society of Association Executives. She has held her CSP certification more than 20 years and is a Certified Environmental, Safety & Health Trainer.

Nicholas Valter, JD, MBA, has more than 20 years of international experience in monitoring safety in work environments. He is currently a practicing attorney and an in-flight safety coordinator for a major airline. He has experience as a union negotiator for airline safety. He has worked internationally with his own companies in both the retail and materials distribution/warehouse export sectors. His undergraduate degree is from Chaminade University, his MBA is from Georgetown University, and he holds a JD from the University of Hawaii. E-mail: nvalter@gmail.com.

Sherrie Wilson was the first female fire fighter–paramedic with the Dallas Fire Rescue Department. She currently serves as the Founder, President, and CEO of Emergency Management Resources LLC and FireHouseCommunications.com. She served on editorial and advisory boards for Industrial Fire World Magazine, Emergency Medical Services Magazine, and Texas EMS Magazine and as a reviewer of EMS text for both Mosby Lifeline and Brady Publishing. She has more than 50 published fire-, EMS-, and emergency-incident-related articles, publications, and conference presentations. She has authored two manuals, Rescue Team Training and Medical Terminology.

Wilson received a BS in Public Administration from Hawthorne University and completed Paramedic training at the University of Texas Health Science Center, Dallas, Texas. She serves as adjunct Health & Safety faculty for Texas A&M University, Texas Engineer Extension Service.

James A. Wolf, CFPS, CXLT, CMGT, retired in 2007 after serving the last 20 years of his career as a risk control consultant with ESIS Global Risk Control Services. He dedicated many years of service to risk management and safety engineering, most particularly in the manufacturing and aerospace industries. E-mail: wolfhamm@comcast.net.

Lynne Zarate, MSE, CIH, CHMM, is Director of the Division of Maintenance and formerly an Environmental Safety Coordinator with the state of Maryland, Montgomery County Public Schools System, which is the 17th largest public school system in the United States. She has been with the school system since 2003, managing a variety of systemwide facilities-related programs. Prior to joining the school system, she worked as the Safety Manager at Georgetown University. Other experience includes biomechanics research in automobile safety, research and operations in the paper manufacturing industry, and space shuttle development and testing at Kennedy Space Center. Zarate holds a master’s degree in Environmental Engineering and a bachelor’s in Chemical Engineering. E-mail: zaratelm@hotmail.com.