

# Biographical Summaries



**Gary A. Benda\*** is President of U.S. Energy Corp.—an environmental management firm specializing in radioactive mixed waste management, health physics, decontamination and decommissioning, and technology development. Previously, he was Vice-President, General Manager of the Programs Division for NUKEM Nuclear Technologies, Inc. His responsibilities included developing and maintaining federal programs in North America that specialized in engineering and waste-processing services. Prior to NUKEM, he spent over 17 years with Chem-Nuclear Systems/WMX Technologies in various management roles. He also directed the site investigation, geophysical analysis, site screening, and license application, as well as managed the public hearings and licensing operations associated with local and national regulatory agencies for new low-level waste sites. He has over 20 years of experience in environmental restoration, technology development, and waste management, and has instructed over 20 national and international professional courses on radioactive waste management, mixed waste, and technology development. He is a member of the American Society of Mechanical Engineers (ASME), American Nuclear Society, and Health Physics Society. He has served as Chair of the ASME National Mixed Waste Committee, Environmental Remediation Committee, and Environmental Engineering Division. He has also chaired over 100 technical sessions at numerous national and international conferences on environmental management. He has authored and coauthored various scientific papers, reports, book chapters, and articles on the nuclear environment. Gary Benda is a Certified Health Physicist. He received a B.S. in Health Physics from Oklahoma State University, an M.S. in Applied Nuclear Science from Georgia Institute of Technology, and an M.B.A. from Seattle City University.

**Erich W. Bretthauer\*** is currently President of the Bryce Meadows Development Corporation. He held the position of research professor at the University of Nevada-Las Vegas from January 1993 to March 1995. In that capacity, he served as Executive Director of Nevada Industry, Science Engineering & Technology, a public-private partnership which developed programs to enhance the scientific infrastructure of the state of Nevada. He was Assistant Administrator for Research and Development at the U.S. Environmental Protection Agency (EPA) from March 1990 until January 1993. In that capacity, he managed the Research and Development activities of a large and multi-disciplinary agency. Erich Bretthauer rose through the ranks of the EPA and served in a number of capacities ranging from a bench scientist to policy manager at national and international levels. He directed the EPA's emergency and long-term monitoring program after the accident at Three Mile Island, as well as its bioremediation program in Prince William

Sound after the Valdez oil spill. He also directed the EPA's ecological research program from 1983-1986 and was Director of EPA's Environmental Monitoring Systems Laboratory in Las Vegas from 1986-1990. He is a member of Sigma Xi, the American Chemical Society, the American Association for the Advancement of Science, and the American Water Works Association, and has served on the Federal Advisory Committee to the Civil Engineering Research Foundation. Erich Bretthauer is the author and coauthor of numerous papers, reports, and other publications. He received his B.S. and M.S. in chemistry from the University of Nevada, Reno.

**Alan S. Corson** is a consultant in hazardous waste issues. He has over 25 years of experience in a number of environmental issues, notably those related to the regulations and management of hazardous waste. Subsequent to his retirement from the U.S. Environmental Protection Agency (EPA), he served in an advisory role to Jacobs Engineering Group and to the Versar Corporation for both government and private sector clients regarding hazardous waste management programs. During his employment at the EPA, he worked at the Office of Solid Waste where he was responsible for regulatory programs and establishing national standards for generators and transporters of hazardous waste; development of sampling and analytic methods for evaluating solid/hazardous waste including the quality assurance/quality control program; and development and management of programs to establish risk assessment of hazardous waste management practices. Alan Corson was instrumental in the development of the original regulatory program defining standards for solid waste and hazardous waste, and setting national standards for recycling hazardous waste. He also initiated, developed, and managed the original program for restricting hazardous wastes from land disposal management options. The framework developed under this program is currently in-place and used for all evaluations in the land-ban program. Alan Corson served as the EPA Office of Solid Waste representative on many intra- and inter-agency workgroups including PCBs, Reportable Quantities, chlorinated solvents, and transportation of hazardous materials. He developed a guide for effective management of infectious wastes—a predecessor to the current regulatory program for medical wastes; characteristics and listings of hazardous waste; and many regulatory options papers for presentation. Alan Corson managed the preparation of numerous regulatory packages for all aspects of the program implementing the Resource Conservation and Recovery Act (RCRA). He has spoken widely and has taught numerous courses on RCRA and its various regulations. He served on numerous national and international panels including review panels of the American

Society of Mechanical Engineers. He received a B.S. in Electrical Engineering and an M.S. in Engineering Management from the Drexel Institute of Technology in Philadelphia, PA.

**Ernest L. Daman\*** is Chairman Emeritus of Foster Wheeler Development Corporation where he previously served as Director of Research and Chairman of the Board. He also held the position of Senior Vice President at the parent company, FWC. He is a Past President of the American Society of Mechanical Engineers (ASME) and was elected to the National Academy of Engineering. Ernest Daman is a Fellow of the Institute of Energy (England) and the American Association for the Advancement of Science, and Past Chairman of the American Association of Engineering Societies. He served on several ASME committees as member or chairman. Ernest Daman is the author of numerous papers and holds 18 patents. He was responsible for the design and development of a combined steam gas turbine plant, fluidized bed combustion, fast breeder reactor components, supercritical steam generators, environmental control processes, and advanced high-efficiency power generation systems. Ernest Daman received his B.M.E. from the Polytechnic Institute of Brooklyn.

**Irwin Feller\*** is Director of the Institute for Policy Research and Evaluation (IPRE) and Professor of Economics at The Pennsylvania State University, where he has been on the faculty since 1963. His current research interests include the economics of academic research, the University's role in technology-based economic development, and the evaluation of federal and state technology programs. He is the author of *Universities and State Governments: A Study in Policy Analysis*, and over 100 refereed journal articles, final research reports, book chapters, reviews, and numerous papers presented to academic, professional, and private organizations. He is former Chair of the Committee on Science, Engineering, and Public Policy, American Association for the Advancement of Science. Irwin Feller was the American Society of Mechanical Engineers Pennsylvania State Fellow in 1996-1997. He has been appointed to the National Academy of Science's Committee on Science, Engineering, and Public Policy, International Benchmarking of U.S. International Competitiveness-Immunity; Transportation Research Board, Research and Technology Coordinating Committee, National Research Council; and National Institute of Standards and Technology-Manufacturing Extension Partnership National Advisory Board. Irwin Feller is Chair of the National Science Foundation's Advisory Committee on Social, Behavioral, and Economic Sciences.

He received a B.B.A. in Economics from the City University of New York and a Ph.D. in Economics from the University of Minnesota.

**Robert A. Fjeld\*** is Dempsey Professor of Environmental Engineering and Science at Clemson University. He coordinates the Department's nuclear environmental focus area, which is concerned with the environmental aspects of nuclear technologies including environmental health physics, radioactive waste management, and risk assessment. Previously, he served as a faculty member in the Nuclear Engineering Department at Texas A&M University. Robert Fjeld is a member of the Health Physics Society, American Nuclear Society, Society for Risk Analysis, and the American Society of Mechanical Engineers, where he serves as newsletter editor for the Mixed Waste Committee. He has served on two National Research Council Committees studying decontamination and decommissioning issues. Robert Fjeld has over 80 technical publications and presentations on topics such as radiation measurements, environmental transport of radionuclides, risk assessment, and aerosol physics. He has active research on actinide transport in soils, instrumentation for measuring radioactivity in environmental samples, and environmental risk assessment. Robert Fjeld received a B.S. from North Carolina State University, and an M.S. and Ph.D. from The Pennsylvania State University. All three degrees are in Nuclear Engineering. He is a registered Professional Engineer.

**John T. Greeves\*** is currently Director of the Division of Waste Management at the U.S. Nuclear Regulatory Commission (USNRC). His experience in the field of nuclear materials management spans 30 years, and includes work in both the private sector and the federal government. Prior to joining the USNRC, he worked for the Bechtel Power Corporation as an engineer responsible for the design and construction of nuclear and conventional power plants. John Greeves has worked for the U.S. government since 1974—with increasing responsibilities in various divisions—including Industrial and Medical Nuclear Safety, and Fuel Cycle Safety and Safeguards. John Greeves has served on a number of national and international panels regarding waste management activities. He is the USNRC's representative to the Waste Safety Standards Advisory Committee of the International Atomic Energy Agency, and has participated extensively in the development of the International Radioactive Waste Management Convention. John Greeves is the recipient of the Presidential Meritorious Rank Award and a member of the

American Society of Civil Engineers. He received a B.S. from the University of Maryland and is a registered Professional Engineer.

**William T. Gregory, III\*** is currently Principal of Vinculum Marketing Solutions. Prior to forming Vinculum, he was Director of Government Programs for Foster Wheeler Environmental Corporation, an engineering and construction firm providing environmental and waste management services to government and private sector clients world-wide. Previously, he held a number of operational and business development positions at equipment manufacturing and service provision firms supporting nuclear utilities, industrial and process industries, and government agencies. His work has involved the management, processing, and disposition of hazardous, radioactive, and mixed wastes. He has also worked on the decontamination and decommissioning of nuclear facilities and on providing a wide range of environmental services in response to regulatory drivers. Prior to entering the private sector, he served with the U.S. Navy on nuclear submarines and at the operational command center for submarine operations in the Atlantic Fleet. William Gregory is actively involved with a number of international, national, and local organizations including: the American Society of Mechanical Engineers (ASME); the American Nuclear Society; and he is a founding member of the Board of Directors for the annual international Waste Management Symposium. William Gregory has served as an elected officer of several ASME divisions. He received a B.S. in Geology from the University of New Mexico, and an M.B.A. from Lamar University. He also attended naval nuclear power, nuclear weapons, and engineering schools as a U.S. Naval officer.

**Tom A. Hendrickson** is currently an Independent Consultant in the fields of energy, engineering, and technology. His career encompassed service to both government and industry. He was a Senior Executive of Raytheon Federal Engineers & Constructors Company, developing high technology projects which included a privately-financed New Production Reactor; the Accelerator Production of Tritium; and the North Korean nuclear energy program. While working at DOE during the previous Bush Administration, he was Principal Deputy Assistant Secretary of the Office of Nuclear Energy including: Civilian Reactor Development; the Naval Nuclear Propulsion Program; Uranium Enrichment; Space and Defense Power Systems; Isotope Production; and Nuclear Safety Policy. He later became the Director of the New Production Reactors for the DOE, responsible for designing and building new tritium production capacity for nuclear weapons;

research and development; safety and environmental compliance; and construction. Concurrently, he served as acting Under Secretary of Energy responsible for all defense and nuclear energy activities of the department. Early in his career, he served on Admiral H. G. Rickover's staff of the Atomic Energy Commission in Washington, DC. He directed the headquarters staff and contractors involved in submarine nuclear propulsion engineering including: research, development, design, and construction of all new design nuclear powered submarines and land-based prototypes. During this period, he also served as Project Officer for all new submarine developments including the NR-1; the USS Los Angeles SSN-688 class of over 60 attack submarines, and the electric drive submarine. He helped with the development of port-entry safety procedures and sea trials of the United States' first nuclear powered surface ships, the USS Long Beach and the USS Enterprise; as well as the first refueling of the Shippingport Atomic Power Station. He is a member of the following professional organizations: The American Nuclear Society; The American Society of Mechanical Engineers; and The American Physical Society. Tom Hendrickson received a B.A. degree in Physics from Harvard College and an M.S. degree in Physics from Georgetown University. He is a Licensed Professional Engineer.

**Nathan H. Hurt\*** is a consultant in management and engineering with Technical and Management Consulting. He provides services to industrial firms and government agencies involved in environmental clean-up and waste management—both chemical and radioactive. He has extensive experience in the areas of executive management; plant management; engineering management; project management; marketing; and sales. He specializes in the areas of: uranium enrichment/production; engineering; development and marketing; plant management of rubber chemicals; petrochemicals; and thermoplastics. He also specializes in the engineering management of synthetic rubber and lattices; vinyl monomers and copolymers; polyesters; DOE weapons plants; quality assurance management; and operational readiness review. Nathan Hurt has been involved with the decommissioning of nuclear facilities. He was the Corporate Sponsor or Program Manager for seven decommissioning contracts at the DOE Complexes in Oak Ridge, TN; and Pinellas, FL. Previously, Nathan Hurt worked for Sharp and Associates, Inc. as the Director and Project Manager at the Oak Ridge Office. He was Vice President and Director of Oak Ridge Operations for IDM Environmental Corp., where he was responsible for the marketing and sales of decontamination,

decommissioning, and waste management. He served as Project Manager for the laboratory quality assurance program at Westinghouse Hanford; DOE's Rocky Flats Plant—plant-wide identification of electrical equipment. He managed a study for a waste treatment and storage facility at the Portsmouth Area Uranium Enrichment Facility which included incineration and compaction of low-level radioactive wastes. He also worked for The Goodyear Tire and Rubber Company, including Goodyear Atomic, as Director of Research and Development, and President, where he was responsible for the operation of the Portsmouth Area Uranium Enrichment Facility. Nathan Hurt is a past President of, the American Society of Mechanical Engineers. He has been a member of: the American Association of Engineering Societies' Board of Governors; the American Institute of Chemical Engineers; and the Institute of Nuclear Materials Management. He is also a member of Tau Beta Pi Honorary Engineering Society; Pi Tau Sigma Honorary Mechanical Engineering Society; and was a member of The Nuclear Engineering Advisory Board of Worcester Polytechnic Institute. Nathan Hurt received a B.S. degree in Mechanical Engineering from the University of CO and has done Graduate, Technical, and Management course work at Pennsylvania State University. He is a registered professional Engineer in OH.

**Michael C. Kirkland** is an independent consultant who led a team that performed a Congressionally-mandated External Independent Review of the \$1.3 billion Spallation Neutron Source Project at Oak Ridge. He assisted in the planning and review of a management assessment at a U.S. Department of Energy (DOE) Site that involved the restart of a plutonium facility. He participated in planning, procurement, and review activities in the environmental remediation area that included decommissioning activities at a shut down nuclear test reactor; designed and installed a ground water cleanup technology. He also provided design oversight for a new facility related to the DOE weapons complex. During his tenure at Savannah River Site (SRS), Michael Kirkland was a Technical Advisor, Project Manager, and Director of the Project Engineering Division. He evaluated nuclear and mixed waste conditions and aspects of high level wastes and spent nuclear fuel; determined material inventories; performed pollution prevention and environmental health and safety evaluations for a proposed waste treatment facility; served as technical advisor to a study administered by the Savannah River Operations Office; and developed integrated schedules defined for this project. Michael Kirkland was director of the Project Engineering Division and managed the SRS design and construction program. He has been involved with waste management and

environmental projects; cutting edge technology programs; and worked with lasers and magnetic containment. He served as Director of the Waste and Fuel Cycle Technology Office and planned and coordinated the programs of the DOE National High Level Waste Technology Office; the SR Fuel Cycle Technology Program; and the Commercial Interim Spent Fuel Management Program. He planned the initial construction of the Consolidated Incinerator Facility which thermally destroys excess benzene created by the In Tank Precipitation process that was to prepare feed material for the Defense Waste Processing Facility. Michael Kirkland was Director of the Commercial Nuclear Spent Fuel Storage Project Office and managed a contract between DOE and the Barnwell Commercial Nuclear Fuel Reprocessing Facility constructed by Allied General Nuclear Services. Michael Kirkland holds a B.S. in Mechanical Engineering from the University of South Carolina. He is registered as a Professional Engineer in South Carolina.

**Peter B. Lederman\*** is a consultant with over 48 years of experience in all facets of process engineering, environmental management, control, and policy development. This includes hazardous substance management; environmental remediation; environmental audit; pollution prevention; development of air pollution control devices; and reuse of waste products. He recently retired as Executive Director of the Center for Environmental Engineering & Science, Executive Director for Patents and Licensing, and Research Professor of Chemical Engineering and Environmental Policy at the New Jersey Institute of Technology. Peter Lederman managed major programs in industrial waste treatment research and development, and in oil and hazardous material spill control and remediation. Most recently, he was responsible for a study of the Economic Impact of Environmental Regulations. He has been responsible for technology transfer efforts including the maturing and licensing of innovative environmental technologies. He is a Fellow of the American Institute of Chemical Engineers (AIChE); a Diplomat of the American Academy of Environmental Engineers; and a member of the American Society of Mechanical Engineers. He has served on several committees of the National Research Council and is the chair of the NRC Committee on Review and Evaluation of the Army Chemical Stockpile Disposal Program. He chaired AIChE's Environmental Division and is currently chair of its Societal Impacts Operating Council. Peter Lederman received a B.S.E., M.S.E., and Ph.D. (All in Chemical Engineering) from the University of Michigan in Ann Arbor, MI and is a registered Professional Engineer.

**Betty R. Love** is currently Executive Vice President of the Institute for Regulatory Science (RSI). In that capacity, she is responsible for the management of day-to-day operations of RSI, and for administration of several projects with an estimated annual operating budget of \$2 million dollars. She is the administrative manager of a large-scale peer review program in collaboration with the American Society of Mechanical Engineers (ASME) for the U.S. Department of Energy (DOE). Her current research activities center around the development and implementation of a systematic approach to stakeholder participation, notably in scientific meetings. Previously, Betty Love was Director, Department of Training and Information within Office of Environmental Health and Safety of Temple University in Philadelphia, PA. During that period she was instrumental in the development of a "Handbook of Environmental Health and Safety." She also developed and implemented a large-scale training program not only for the faculty and staff of the University but also for others. Betty Love is currently Managing Editor of *Technology*. She has published several papers in peer-reviewed journals and is the primary author of *Manual for Stakeholder Participation* and *Stakeholder participation in Scientific Meetings*. Betty Love received a B.S. in Business Administration from Virginia State University in Petersburg, VA and an M.S. in Developmental Clinical Psychology from Antioch College in Yellow Springs, OH.

**Jeffrey A. Marqusee\*** is currently the Technical Director of the Strategic Environmental Research and Development Program (SERDP) and the Director of the Environmental Security Technology Certification Program (ESTCP). SERDP is a tri-agency (DoD, DOE and EPA) environmental research and development program managed by the Department of Defense. SERDP supports research and development to solve environmental issues of relevance to DoD in the areas of cleanup, compliance, conservation and pollution prevention. ESTCP is a DoD-wide program designed to demonstrate innovative environmental technologies at DoD facilities. ESTCP provides for rigorous validation of the cost and performance of new environmental technologies in cooperation with the regulatory and end-user communities. Prior to his current position, Jeffrey Marqusee served as a program manager for environmental technology in the Office of the Deputy Under Secretary of Defense for Environmental Security. He was the principal advisor to the Deputy Under Secretary on environmental technology issues. Before joining DoD, he worked at the Institute for Defense Analyses, where he advised both DoD and NASA in the areas of remote sensing, environmental matters and military

surveillance. Jeffrey Marqusee has worked at Stanford University, the University of California and the National Institute of Standards and Technology. He has a Ph.D. from the Massachusetts Institute of Technology in Physical Chemistry.

**James E. Martin** is currently Associate Professor of Radiological Health at the University of Michigan's Department of Environmental and Industrial Health where he is involved in research and teaching related to radiation protection. His interests include: radiation physics; radiological assessment; radio-analytical measurements; internal radiation dosimetry; radioactive waste management; and radiation protection standards and their regulatory aspects. After a 25-year career with the U.S. Public Health Service and the Environmental Protection Agency, he served as Chief of the Hazardous and Solid Waste Program at the Colorado State Health Department which included consultations with the legislature and EPA. James Martin is Certified in Health Physics by the American Board of Health Physics. He has been involved in numerous scholarly and policy activities including: chair of the Michigan Toxic Substance Control Commission; committee member of the National Research Council on CDC Radiation Studies; member of the EPA's National Advisory Committee on Environmental Protection for Radwaste; member of the Environmental Management Board of the U.S. Department of Energy; Chair of the Committee on Formerly Utilized Sites Remedial Action Program (FUSRAP); member of the Advisory Committee on Nuclear Facility Safety to the Secretary of Energy; and a member of EPA's Science Advisory Board-Radiation Advisory Committee. Professor Martin received the Meritorious Service Award from the U.S. Public Health Service, and has published numerous papers in peer-reviewed journals on radiation measurements, radioactive waste, and radiation protection. He received a B.A. degree in physics from Vanderbilt University in Nashville, TN; an MPH degree in radiological health; and a Ph.D. degree in radiological health from the University of Michigan in Ann Arbor, MI.

**A. Alan Moghissi\*** is currently President of the Institute for Regulatory Science (RSI), a non-profit organization dedicated to the idea that societal decisions must be based on best available scientific information. The activities of the Institute include research, scientific assessment, and science education at all levels—particularly the education of minorities. Previously, Alan Moghissi was Associate Vice President for Environmental Health and Safety at Temple University in Philadelphia, PA and Assistant Vice President for Environmental Health and

Safety the University of Maryland at Baltimore. In both positions, he established an environmental health and safety program and resolved a number of relevant existing problems in those institutions. As a charter member of the U.S. Environmental Protection Agency (EPA), he served in a number of capacities, including Director of the Bioenvironmental/Radiological Research Division; Principal Science Advisor for Radiation and Hazardous Materials; and Manager of the Health and Environmental Risk Analysis Program. Alan Moghissi has been affiliated with a number of universities. He was a visiting professor at Georgia Tech and the University of Virginia, and was also affiliated with the University of Nevada and the Catholic University of America. Alan Moghissi's research has dealt with diverse subjects ranging from measurement of pollutants to biological effects of environmental agents. A major segment of his research has been on scientific information upon which laws, regulations, and judicial decisions are based—notably risk assessment. He has published nearly 400 papers, including several books. He is the Editor-in-Chief of *Technology: A Journal of Science Serving Legislative, Regulatory, and Judicial Systems*, which traces its roots to the *Journal of the Franklin Institute*—one of America's oldest continuously published journals of science and technology. Alan Moghissi is a member of the editorial board of several other scientific journals and is active in a number of civic, academic, and scientific organizations. He has served on a number of national and international committees and panels. He is a member of a number of professional societies including the American Society of Mechanical Engineers and is past chair of its Environmental Engineering Division. He is also an academic councilor of the Russian Academy of Engineering. Alan Moghissi received his education at the University of Zurich, Switzerland, and Technical University of Karlsruhe in Germany, where he received a doctorate degree in physical chemistry.

**Lawrence C. Mohr, Jr.\*** is currently Professor of Medicine, Biometry, and Epidemiology; and Director of the Environmental Biosciences Program at the Medical University of South Carolina. His areas of research and special interest include internal medicine and pulmonary disease—specifically diseases of the chest and respiratory system. An area of particular interest to Lawrence Mohr is environmental medicine, including molecular epidemiology and biomarker applications. He has been involved in studies related to environmental lung disease; pathophysiology; prevention and treatment of high altitude illness; high altitude physiology; risk assessment of environmental hazards and clinical epidemiology.

Other areas of considerable interest to Lawrence Mohr are assessment of clinical outcomes; health policy analysis; and international health. This latter area includes: global epidemiology; medical relief operations; and health care in Central and Eastern Europe, as well as medical history—the impact of illness on world leaders. Previously, he held academic appointments as a Teaching Fellow in Medicine at the Uniformed Services University of the Health Sciences in Bethesda, MD. He was Associate Clinical Professor of Medicine and Emergency Medicine at George Washington University, Washington, DC. While in these institutions, he was a staff member of the Medical Support Group for the President of the United States. Lawrence Mohr was on the Medical Staff of Walter Reed Army Medical Center—where he completed his Internship and Residency in Internal Medicine—as well as George Washington University Hospital, both in Washington, DC. He has held Visiting Professorships at various universities. He served as Visiting Chief Resident at Presbyterian Hospital and Visiting Professor at the School of Nursing, both at Columbia University. Additionally, Lawrence Mohr was Visiting Professor of: William Beaumont Army Medical Center, Tulane University, University of Cincinnati, New York University, Brown University, East Carolina University, and the Mayo Clinic. Lawrence Mohr is a Fellow of the American College of Physicians and the American College of Chest Physicians. He is a member of several professional societies including: the American Federation for Medical Research; the Society for Risk Analysis; and the Wilderness Medical Society. Previously, he was on the Scientific Advisory Board for the Consortium in Environmental Risk Evaluation and the Savannah River Health Information System. He has authored or coauthored more than 60 articles, books, or technical publications. He received an A.B. degree in Chemistry as well as an M.D. degree, both from the University of North Carolina, Chapel Hill. Lawrence Mohr, Jr., is certified by the American Board of Internal Medicine.

**Goetz K. Oertel\*** is President Emeritus and former CEO of the Association of Universities for Research in Astronomy, Inc. (AURA). AURA is a \$150 Million per year non-profit corporation that operates the Hubble Space Telescope Science Institute and ground-based astronomical observatories around the world and is building international Gemini 8-meter telescopes in Hawaii and in Chile. Previously, he was a Senior Executive in the U.S. Department of Energy. Assignments included Deputy Assistant Secretary for Safety, Health, and Quality Assurance; Deputy Manager of the Albuquerque Operations Office; Deputy and

Acting Manager of the Savannah River Operations Office; and Director of the Office of Byproducts and Waste Management in Defense Programs in Washington. Previously, he was Chief of Solar Physics and manager of several space science programs in NASA Headquarters—and before that—aerospace engineer and group leader at NASA's Langley Research Center. He held career development positions with the President's Science Advisor and in the Office of Management and Budget in the Executive Office of the President. He authored numerous publications in science and engineering and holds patents. He has served on and chaired professional committees in engineering and other sciences—including a committee of the National Research Council. He is the U.S. representative to the Commission on DATA (CODATA) at the International Council of Scientific Unions and serves on several non-profit Boards in Education and science. He is a fellow of the American Association for the Advancement of Science and member of numerous national and international professional organizations. He graduated from the University of Kiel, Germany with major in physics and minors in chemistry and mathematics. As a Fulbright grantee, he earned a Ph.D. in physics from the University of Maryland in College Park.

**Sorin R. Straja** is currently Vice President for Science and Technology of the Institute for Regulatory Science. He has over 20 years of expertise in mathematical modeling and software development as applied in chemical engineering and risk assessment. Previously he served as Assistant Professor of Biostatistics with Temple University, Philadelphia; as Director of the Department of Occupational Health and Safety of Temple University, Philadelphia; and as a chemist with University of Maryland at Baltimore. Sorin Straja has extensive experience in the chemical industry where he worked as a senior R&D consultant with the Chemical and Biochemical Energetics Institute, and as a plant manager with Chemicals Enterprise Duesti and Plastics Processing Bucharest from Romania. He was an Assistant/Adjunct Professor of Chemical Engineering with the Polytechnic Institute Bucharest. Sorin Straja is the author of two books and 44 scientific papers published in internationally recognized and peer reviewed journals. He was an editor of *Environment International*, and currently is a contributing editor of *Technology*. Sorin Straja received a Certificate of Appreciation for Teaching from Temple University, the "Nicolae Teclu" Prize of the Romanian Academy, and a Certificate of Appreciation from U.S. Department of Agriculture for significant volunteer contributions. He is a Fellow of the Global Association of Risk Professionals, and a member of the American Chemical Society, American Institute

of Chemical Engineers, Society for Risk Analysis, and New York Academy of Sciences. Sorin Straja holds a M.S. in Industrial Chemistry and a Ph.D. in Chemical Engineering both from Polytechnic Institute Bucharest.

**Glenn W. Suter\*** is currently Science Advisor at the National Center for Environmental Assessment of the U.S. Environmental Protection Agency (EPA) in Cincinnati, OH. Previous to his current position, he was at Oak Ridge National Laboratory, initially as Research Associate and gradually rising to Science Leader at the Environment Science Division of the Laboratory. His interest has focused on Ecotoxicology in general and Ecological Risk Assessment in particular. He is one of the developers of the most widely-used methodology for Ecological Risk Assessment. This method has been applied to the impact of pollutants on fish, contaminated soils, production of synthetic fuels, and various other ecosystems. Glenn Suter has lectured widely, both nationally and internationally on Ecological Risk Assessment. He is currently a member of the U.S. EPA's Risk Assessment Forum. He has been a member of numerous panels and has consulted with various governmental agencies and private organizations, including the Council of Environmental Quality. He was a member of the Scientific Review Panel for Savannah River Ecology Laboratory; the National Science Foundation Panel on Decision Making and Valuation for Environmental Policy; and the U.S. EPA Science Advisory Board and Conservation Foundation, Ecosystem Valuation Forum. In addition, he was a member of the International Institute of Applied Systems Analysis Task Force on Risk and Policy Analysis and the Council on Environmental Quality. He was a member of the Board of Directors, for the Society for Environmental Toxicology and Chemistry. Glenn Suter is presently on the Editorial Board of *Environmental Health Perspectives* and *Human and Ecological Risk Assessment*. Previously, he was on the Editorial Board of *Handbook of Environmental Risk Assessment and Management* and *Environmental Toxicology and Chemistry*. Glenn Suter is the author of three books and is author and coauthor of over 200 publications. He received a B.S. degree in Biology from Virginia Polytechnic Institute and a Ph.D. in Ecology from the University of California, Davis.

**Wade O. Troxell** is President/Chief Operating Officer and Founder of Sixth Dimension, Inc., a development stage company offering Internet-based products to the electric power industry. He is currently on a leave-of-absence as Associate Professor of Mechanical Engineering at Colorado State University (CSU); and Director of Robotics and Autonomous Machines Laboratory at CSU. His research

interests consist of product realization processes; design support systems; and behavior-based robots (task-structured approach to building robust and reliable autonomous intelligent systems). His research interests also include robot programming and control (high-level formalisms, complexity measures, and verification). His professional experience is extensive and includes his positions as: Executive Director of the U.S. National Institute of Standards and Technology (NIST)/Mid-America Manufacturing Technology Center, Colorado Regional Office; Director of the Manufacturing Excellence Center at CSU; and Assistant Professor of Mechanical Engineering at CSU. He was also a Director of the Manufacturing and Robotic Systems Laboratory, Mechanical Engineering at CSU; Robotic Consultant to the Public Service Company of Colorado, Nuclear Engineering Division (Fort St. Vrain Station on the controller retrofit of the fuel handling robot); and NATO Postdoctoral Fellow at the University of Edinburgh in the Department of Artificial Intelligence. He was a Consultant, specializing in product design and process automation; a Mechanical Engineer for the Eastman Kodak Company; and a Consulting Bioengineer with Staodynamics, Inc. He has provided services as an expert witness related to legal cases involving trade secrets, patent infringements, and product liability. Wade Troxell is currently Advisor to the Senior Vice President of the ASME Council of Member Affairs. He serves on the ASME Inter-Council Committee for Federal R&D; the ASME/NIST Interaction Committee; and is the Chair of the ASME Distinguished Lecturers' Program. In addition, he served as the ASME Vice President for Region XII (Rocky Mountains), and serves as Chair of the Mechanical Engineering MS Program for the National Technological University. He serves on the Board of Directors for Sixth Dimension, Inc, and is Advisor to the Board of Directors for the Boulder Technology Incubator. He is the recipient of the ASME Dedicated Service Award. Wade Troxell is a member of Tau Beta Pi. He is the author or coauthor of over 50 refereed publications, technical reports, and conference proceedings. Wade Troxell received a B.S. degree in Engineering Science, an M.S. degree, and a Ph.D. degree in Mechanical Engineering, all from CSU.

**Charles O. Velzy\*** is a consultant in the field of waste treatment and disposal. Previously, he held increasingly responsible positions with the environmental consulting engineering firm, Charles R. Velzy Associates, Inc., becoming president in 1976. In 1987, when Velzy Associates merged with Roy F. Weston, Inc., Charles Velzy became Vice President of Weston, a position which he held until retiring in 1992. He has over 35 years of experience as an environmental engineering consultant specializing in: the analysis of waste management problems; design of

wastewater treatment and waste disposal systems; and design of new, retrofit of existing, testing, and permitting of waste combustion facilities. He has authored or co-authored over 80 publications—primarily in the field of solid waste management. He has served on the Science Advisory Board of the U.S. Environmental Protection Agency; as President of the American Society of Mechanical Engineers (ASME); and as Treasurer of the American Academy of Environmental Engineers (AAEE). He has served on numerous committees of the ASME, the AAEE, the American National Standards Institute, and the American Society for Testing and Materials. He is a registered professional engineer in New York and eleven other states. Charles Velzy received B.S. degrees in Mechanical and Civil Engineering, and an M.S. in Sanitary Engineering from the University of Illinois at Urbana-Champaign.

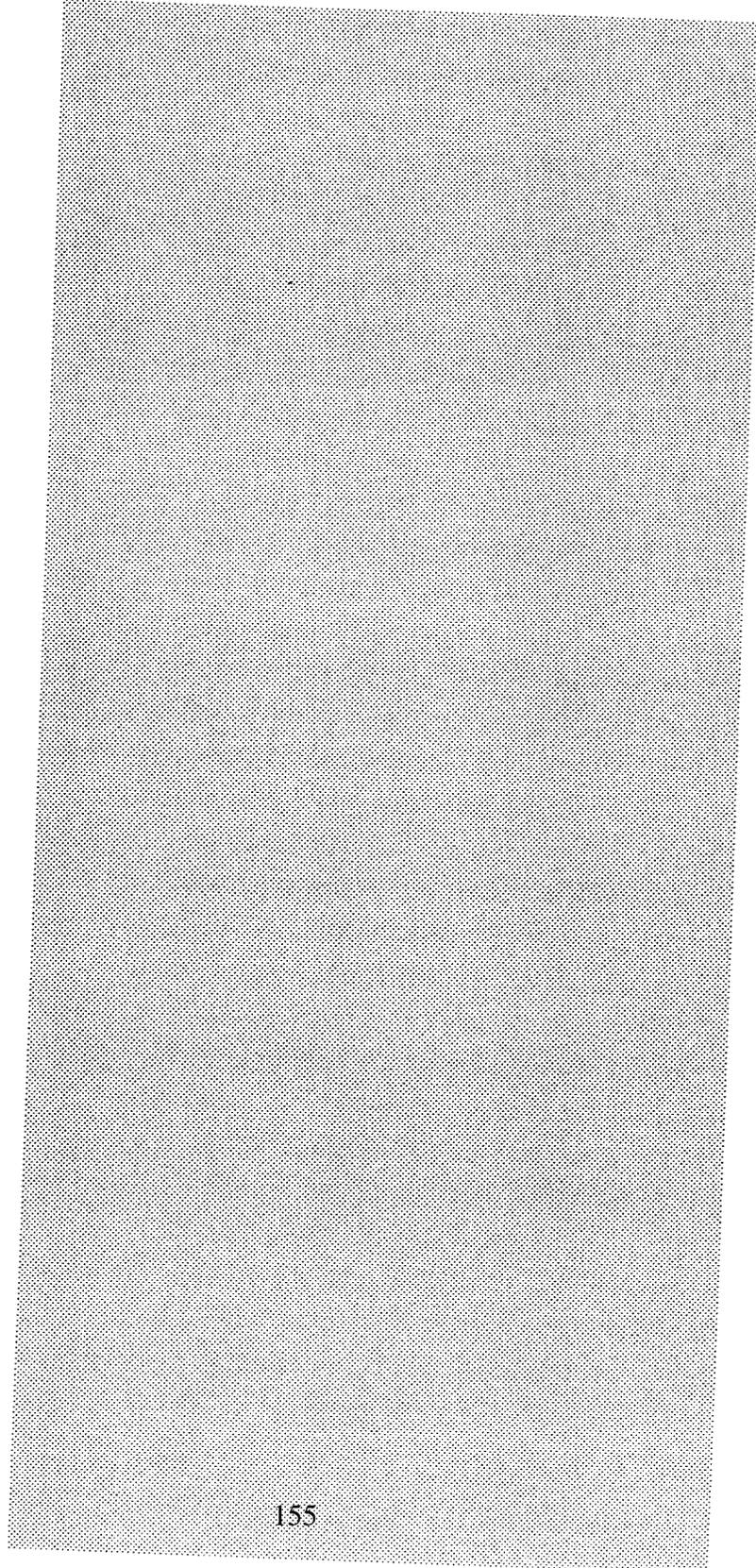
**Richard Wilson** is currently emeritus Mallinckrodt Research Professor of Physics at Harvard University in Cambridge, MA. He is also an affiliate of the Center for Middle Eastern Studies; the Harvard Center for Risk Analysis; and of the Program on Science and International affairs at the Kennedy School of Government. He used the principle of detailed balance to measure the spin of the pi-zero meson and studied nucleon-nucleon scattering at the Harvard Cyclotron Laboratory. He was involved in converting the Harvard University Cyclotron from nuclear physics use to medical treatment. He was the first to analyze elastic scattering data in terms of the electric and magnetic form factors. He studied nucleon structure by electron-proton scattering and muon proton scattering. He was a participant in the Cambridge Electron Accelerator “by-pass” program, which demonstrated an unusually large cross-section for producing hadrons. Richard Wilson closely followed the Russian and Ukrainian radiation accidents at Chernobyl in the Ukraine, and the accidents at the Techa River and the Mayak production complex in the Ural Mountains. He performed research on the risk assessment of chemical carcinogens. Richard Wilson is Chairman of the visiting committee of the radiation medicine department at Massachusetts General Hospital. He is Chairman of an International Advisory Committee to the newly formed Sakharov College of Radioecology in Minsk, Belarus, and serves as a member of the Board of Directors of the Andrey Sakhorov Foundation of New York and Moscow. He was the first Chairman of the Harvard Cyclotron Operating Committee and is still a member. He is a Fellow of the American Physical Society, Chaired its committee to study the radiological consequences of severe nuclear power accidents, and received its

“Forum Award”. Richard Wilson chaired an advisory committee for the Minister of Economic Affairs of the Republic of China. He is a founder/member of the Society of Risk Analysis, as well as the recipient of its Distinguished Service Award. He is a member of the American Nuclear Society and the Society of Toxicology. He served as the Director of the NE Regional Center of the National Institute of Global Environmental Change. He has held various positions as a Visiting Professor, Scholar, and Scientist and served on numerous government advisory committees in many different agencies and countries. Richard Wilson is the author or coauthor of more than 800 published papers. He is the editor of the English translation of the Russian Journal, *Radiation and Risk*, which is published by the Russian Medical Research Laboratory in Obninsk and is mainly about the effects of Chernobyl. Richard Wilson holds a B.A. degree; an M.A. degree and a Ph.D. degree; all in Physics and all from Christ Church, Oxford University, Oxford, England.

\* Members of ASME Peer Review Committee



# List of Acronyms





<b>AK</b>	Acceptable Knowledge
<b>ALARA</b>	As Low As Reasonably Achievable
<b>ASME</b>	American Society of Mechanical Engineers
<b>CAG</b>	Compliance Application Guidelines
<b>CBFO</b>	Carlsbad Field Office
<b>CCA</b>	Compliance Certification Application
<b>CERCLA</b>	Comprehensive Environmental Response Compensation and Recovery Act
<b>CFR</b>	Code of Federal Regulations
<b>CH</b>	Contact-Handled
<b>CPR</b>	Cellulosic, Plastic, and Rubber
<b>DOE</b>	U. S. Department of Energy
<b>DOT</b>	U. S. Department of Transportation
<b>DQA</b>	Data Quality Objective
<b>EIS</b>	Environmental Impact Statement
<b>EP</b>	Executive Panel
<b>EPA</b>	U. S. Environmental Protection Agency
<b>FEIS</b>	Final Environmental Impact Statement
<b>FTIRS</b>	Fourier Transform Infrared System
<b>GC</b>	Gas Chromathography
<b>HPLC</b>	High Pressure Liquid Chromatography
<b>HWFP</b>	Hazardous Waste Facility Permit
<b>LWA</b>	Land Withdrawal Act
<b>MS</b>	Mass Spectrometry
<b>NDA</b>	Non-Destructive Assay
<b>NDE</b>	Nondestructive Evaluation
<b>NEPA</b>	National Environmental Policy Act
<b>NMAC</b>	New Mexico Administrative Code
<b>NMED</b>	New Mexico Environmental Department
<b>NQA</b>	Nuclear Quality Assurance
<b>NRC</b>	National Research Council
<b>NUREG</b>	Nuclear Regulatory Guidelines
<b>OST</b>	Office of Science and Technology
<b>PA</b>	Performance Assessment
<b>PAN</b>	Passive/Active Neutron
<b>PBMS</b>	Performance-Based Measurement System
<b>PCB</b>	Polychlorinated Biphenyl
<b>PRC</b>	Peer Review Committee (of ASME)
<b>PREPP</b>	Process Experimental Pilot Plant

<b>QA</b>	Quality Assurance
<b>QAO</b>	Quality Assurance Objective
<b>QC</b>	Quality Control
<b>RCRA</b>	Resource Conservation and Recovery Act
<b>RH</b>	Remote-Handled
<b>RP</b>	Review Panel
<b>RSI</b>	Institute for Regulatory Science
<b>SEIS</b>	Supplemental Environmental Impact Statement
<b>SGS</b>	Segmented Gamma Scans
<b>SPC</b>	Statistical Process Control
<b>SWB</b>	Standard Waste Box
<b>TDOP</b>	Ten-Drum Overpack
<b>TIC</b>	Tentatively Identified Compound
<b>TRU</b>	Transuranic
<b>TRUDOCK</b>	Waste handling area of WIPP
<b>TRUPACT-II</b>	Transuranic Package Transporter, Model 2
<b>TSDF</b>	Permit Treatment, Storage and Disposal Facility
<b>TSDF-WAC</b>	Permit Treatment, Storage and Disposal Facility Waste Acceptance Criteria
<b>UCL</b>	Upper Confidence Limit
<b>USNRC</b>	U. S. Nuclear Regulatory Commission
<b>VE</b>	Visual Examination
<b>VOC</b>	Volatile Organic Compound
<b>WAC</b>	Waste Acceptance Criteria
<b>WAP</b>	Waste Analysis Plan
<b>WHB</b>	Waste Handling Building
<b>WIPP</b>	Waste Isolation Pilot Plant
<b>WSPF</b>	Waste Stream Profile Form
<b>WWIS</b>	WIPP Waste Information System