

Laying the Foundation for New and Advanced Nuclear Reactors in the United States

Committee

Richard A. Meserve

Chair

Richard A. Meserve is Senior Of Counsel in the Washington, DC, office of Covington & Burling LLP, president emeritus of the Carnegie Institution for Science, and former chair of the US Nuclear Regulatory Commission. Early in his career, after obtaining a PhD in applied physics from Stanford and a JD from Harvard Law School, he served as law clerk to Supreme Court Justice Harry A. Blackmun and as legal counsel to the president's science advisor. He has served on and chaired numerous legal and scientific committees, including many convened by the National Academies. Among other activities, he is the former president of the board of overseers of Harvard University and chair of the International Nuclear Safety Group (chartered by the International Atomic Energy Agency). He is a member of the National Academy of Engineering and served on its council. He is also a member of the American Academy of Arts and Sciences (former member of its council and trust), the American Philosophical Society, and the Council on Foreign Relations, a fellow the American Physical Society, and a foreign member of the Russian Academy of Sciences.

Ahmed Abdulla

Member

Dr. Ahmed Abdulla is an assistant professor in the Department of Mechanical and Aerospace Engineering at Carleton University (Ottawa, ON). He develops energy system models for deep decarbonization. Modeling efforts focus on evaluating the role of disruptive energy technologies that sit at a low level of technical readiness; including energy storage systems, advanced nuclear power, and negative emissions technologies. Dr. Abdulla advances process modeling, systems engineering, engineering economics, and quantitative risk and decision analysis in his research. He integrates insights from public policy and behavioral science in his models, to deploy truly sustainable technologies—ones that are both techno-economically viable and socio-politically acceptable. Dr. Abdulla co-leads the APEX (Alternative Pathways for the Energy Transition) research group at Carleton, which consists of highly interdisciplinary engineers devoted to accelerating the transition to a deeply decarbonized energy system and averting the worst consequences of climate change. Results from his research have been published in leading journals, including Nature Climate Change, Nature Communications, the Proceedings of the National Academy of Sciences, Philosophical Transactions of the Royal Society; Environmental Science and Technology; Risk Analysis; and Environmental Research Letters. His findings have been featured in The Wall Street Journal, The Los Angeles Times, Bloomberg News, and National Public Radio. He received his B.S.E. in Chemical Engineering from Princeton University, and his Ph.D. in Engineering and Public Policy from Carnegie Mellon University.

Todd Allen

Member

Dr. Todd Allen is currently a faculty member and chair of the Nuclear Engineering & Radiological Sciences Department at the University of Michigan and a senior fellow at Third Way, a DC-based think tank, supporting their clean energy portfolio. He was the Deputy Director for Science and Technology at the Idaho National Laboratory from January 2013 through January 2016. Both the INL and Third Way positions occurred while on leave from the University of Wisconsin. Previously, he was a professor in the Engineering Physics Department at the University of Wisconsin, a position held from September 2003 through December 2018. In addition to his teaching and research responsibilities at Wisconsin, he was also the Scientific Director of the Advanced Test Reactor National Scientific User Facility, centered in Idaho Falls, Idaho, at the Idaho National Laboratory. He held that position from March 2008-December 2012. He was also the Director of the Center for Material Science of Nuclear Fuel, a Department of Energy-sponsored Energy Frontier Research Center. Prior to joining the faculty at the University of Wisconsin, he was a Nuclear Engineer at Argonne National Laboratory-West in Idaho Falls. His doctoral degree is in Nuclear Engineering from the University of Michigan (1997). Prior to graduate work, he was an officer in the United States Navy Nuclear Power Program.

Jaquelin Cochran

Member

Dr. Jaquelin Cochran is the director of the Grid Planning and Analysis Center at the National Renewable Energy Laboratory, where she has worked since 2009. Dr. Cochran's work has focused on the evolution of the power grid with high deployment of renewable energy. She recently led the Los Angeles 100% Renewable Energy Study and a portfolio of analyses about India's power system. Before joining NREL, Dr. Cochran was an Assistant Professor of Natural Resource Management with KIMEP University in Almaty, Kazakhstan. She also served as a Peace Corps Volunteer for two years with the Polish Foundation for Energy Efficiency (FEWE) in Krakow. She holds a Ph.D. and M.A. from the Energy & Resources Group at the University of California at Berkeley, and a B.A. from Pomona College.

Michael L. Corradini

Member

Dr. Michael L. Corradini (NAE) is Emeritus Wisconsin Distinguished Professor of Nuclear Engineering and Engineering Physics at the University of Wisconsin-Madison. He served from 1995 to 2001 as Associate Dean for the College of Engineering and as Chair of Engineering Physics from 2001-2011. He has published widely in areas related to vapor explosion phenomena, jet spray dynamics, and transport phenomena in multiphase systems. From 1978-1981 he served as a member of technical staff of Sandia National Laboratories. In 1998, he was elected to the National Academy of Engineering. He has also served as a presidential appointee in 2002 and 2003 as the chairman of the Nuclear Waste Technical Review Board (a separate government agency). From 2004-2008, he served as a board member of the INPO National Accreditation Board for Nuclear Training. In 2006, he was appointed to the NRC Advisory Committee on Reactor Safeguards and was elected to the National Council on Radiation Protection. In 2010, he was appointed Chair of the Scientific Advisory Committee to the French Atomic Energy Agency. He began and served as the Director of the Wisconsin Energy Institute. He was elected as the President of the American Nuclear Society for 2012 - 2013. Michael received his B.S. in Mechanical Engineering from Marquette University, Milwaukee WI; M.S. in Nuclear Engineering from Massachusetts Institute of Technology, and Ph.D. in Nuclear Engineering from Massachusetts Institute of Technology.

Richard Cupitt

Member

Dr. Richard Cupitt is a senior fellow and director of the Partnerships in Proliferation Prevention program at Stimson. His areas of expertise include WMD nonproliferation, export controls, and foreign policy. Prior to joining Stimson, he served as the Special Coordinator for U.N. Security Council resolution 1540 in the Office of Counterproliferation Initiatives at the U.S. State Department from 2012 through 2016. As such, he led U.S. government efforts to further implementation of the more than two hundred legally binding obligations and recommendations of the resolution, which aims to combat proliferation of WMD and their means of delivery, especially to non-state actors such as terrorists and criminal organizations. From 2005 to 2012, he worked as an expert for the committee established pursuant to U.N. Security Council resolution 1540 (2004), a subsidiary body of the U.N. Security Council, monitoring and facilitating implementation of the resolution in all U.N. Member States, along with building relationships with more than forty international organizations, coordinating assistance activities, and conducting outreach with industry and academia. Elected coordinator of the experts from 2010-2012, he also led the work in several specialized areas including combating the financing of proliferation and export controls. From 2004 to 2008, Cupitt also held a position as Scholar-in-Residence at American University and worked as Special Adviser for International Cooperation for the U.S. Undersecretary of Commerce in the Bureau of Industry and Security from 2002-2004. From 1988 to 2002, Cupitt had various posts for the Center International Trade and Security (CITS) of the University of Georgia, including Associate Director, as well as acting as a visiting scholar at the Center for Strategic and International Studies (CSIS) in 2000-2002. Cupitt also has held academic positions at Emory University and the University of North Texas. He has produced four books and more than 20 peer-reviewed articles on nonproliferation export controls, along with dozens of other security or trade-oriented publications. In addition, he has served as a consultant on projects for the U.S. State Department, several U.S. national commissions, U.S. national nuclear laboratories, and various international organizations.

Leslie Dewan

Member

Dr. Leslie Dewan is the CEO of RadiantNano, a nuclear startup developing next-generation radiation detectors with applications in national security, clean energy production, and medical diagnostics. Previously, she was the CEO of Transatomic Power, a company that designed safer nuclear reactors that leave behind less waste than conventional designs. Leslie received her Ph.D. in nuclear engineering from MIT, with a research focus on computational nuclear materials. She also holds S.B. degrees from MIT in mechanical engineering and nuclear engineering. Before starting her Ph.D., she worked for a robotics company in Cambridge, MA, where she designed search-and-rescue robots and equipment for in-field identification of chemical and nuclear weapons.

Leslie has been awarded an MIT Presidential Fellowship and a Department of Energy Computational Science Graduate Fellowship. She has served on the MIT Corporation, MIT's board of trustees. Leslie has been named a TIME Magazine "30 People Under 30 Changing the World," an MIT Technology Review "Innovator Under 35," a Forbes "30 Under 30," a National Geographic Explorer, and a World Economic Forum Young Global Leader.

Michael Ford

Member

Dr. Michael Ford is the Associate Laboratory Director for Engineering at the Princeton Plasma Physics Laboratory. In this role, Dr. Ford leads the pursuit of PPPL's mission to develop advanced fusion engineering knowledge and techniques and is responsible for all engineering support throughout the Laboratory. Prior to assuming his position at PPPL, Dr. Ford served as the Strategy Development Director for the Energy and Global Security (EGS) Directorate at the Argonne National Laboratory. At Argonne, he helped develop strategies designed to build increased sponsor support for energy and national security-related research. Dr. Ford remains active in energy, engineering risk, and environmental policy research, and led Phase I of the National Demonstration Reactor Siting Study supporting the National Reactor Innovation Center. Prior to his work in the National Laboratories system, Dr. Ford held research positions at the Harvard University Center for the Environment and at the Belfer Center for Science and International Affairs, Harvard Kennedy School. He earned his PhD in engineering and public policy at Carnegie Mellon University (CMU), where he conducted research in energy and the environment, with a focus on advanced reactor technology development and proliferation risk. Dr. Ford also served a full career as an officer in the United States Navy and held Navy subspecialties in nuclear engineering, resource management, and operations analysis. During his time on active duty, CAPT (Ret) Ford commanded the guided-missile cruiser USS BUNKER HILL (CG 52) and the guided-missile destroyer USS MUSTIN (DDG 89) and served as lead nuclear engineer (Reactor Officer) aboard USS NIMITZ (CVN 68). Ashore, he held senior finance and resource management positions on the U.S. Navy and U.S. Joint Staffs at the Pentagon. In these positions, he developed standards for new warfare systems development and helped lead the Navy Quadrennial Defense Review process.

Kirsty Gogan

Member

Kirsty Gogan is an internationally sought-after advisor to governments, industry, academic networks and NGOs. Kirsty is regularly invited as an expert speaker on science communication, climate change, competitiveness and innovation to high profile events around the world. She has more than 15 years of experience as a senior advisor to Government on climate and energy policy, including 10 Downing Street, and the Office of the Deputy Prime Minister. As Deputy Head of Civil Nuclear Security, Kirsty reviewed the UK national communications response to Fukushima, and implemented a number of recommendations supported by industry and Government. She subsequently provided editorial oversight for the revision of the Civil Nuclear Emergency Planning and Response Guidance. Leading the Government's public consultation into the UK's nuclear new build program, Kirsty addressed public concerns about nuclear power and engaged antinuclear campaigners in a constructive dialogue process with Government that continues to this day. Kirsty is now managing partner of LucidCatalyst, a highly specialized international consultancy offering thought leadership, strategy development and techno-economic expertise focused on multiplying and accelerating zero carbon technology options available for large-scale, affordable, market-based decarbonization of the global economy over a wide range of future scenarios. Kirsty is also co-founder of Energy for Humanity (EFH), an environmental NGO focused on large scale deep decarbonization and energy access. Under Kirsty's leadership, EFH was shortlisted for the Business Green Leaders "Green NGO of the Year" Award in 2016 and received the U.S. Nuclear Industry Council Trailblazer Award in 2019. At COP21 in Paris, EFH organized a press conference that led to media coverage reaching an estimated audience of 800 million people globally. EFH jointly launched the Clean Energy Ministerial Flexible Nuclear Campaign in May 2019, supported by the Canadian, U.S., and UK governments, and in partnership with ClearPath Foundation. Kirsty is also co-founder, with Eric Ingersoll, of TerraPraxis, a new non-profit focused on energy innovation for a prosperous planet.

Ning Kang

Member

Dr. Ning Kang is the Department Manager of the Idaho National Laboratory's Power & Energy Systems Department, specializing in modeling of distributed energy resources (DERs), microgrid design and field deployment, hydropower analysis, clean and renewable energy resources integration into the grid, power and controller hardware-in-the-loop testing, development of intermediate-temperature and high-temperature electrolysis, and integration of hydrogen production with nuclear power plants. Before joining INL, she was a Principal Engineer at the Argonne National Laboratory where she focused on research in transmission and distribution systems (T&D) co-simulation and planning and operations coordination, reliability impact of DERs on the bulk electric system (BES), advanced distribution management system (ADMS), and microgrid integration and impact analysis. Ning has had 6 years of industry R&D experience when she was a Senior R&D Engineer at ABB U.S. Corporate Research Center in Raleigh, NC. At ABB, she was the main contributor to developing a substation-based protection and automation solution, a Volt-VAR optimization solution considering high DER penetration for ABB's DMS software, and condition-based and data-driven algorithms for ABB's recloser controllers. She is the main creator of an open-source T&D systems co-simulation software (TDcoSim) and holds five U.S. patents and one U.S. patent application. She has co-authored more than 39 journal and conference papers, book chapters, and technical reports. Ning is a senior member of the IEEE Power and Energy Society. She is also a member of NERC's Systems Planning Impacts of Distributed Energy Resources Working Group (SPIDERWG). Dr. Kang currently serves as the senior editor of the Power and Energy Section of the IEEE Access Journal and the steering committee member of IEEE Transactions on Cloud Computing. Dr. Kang has been a registered Professional Engineer since 2015. She earned her doctorate in electrical engineering from the University of Kentucky.

Allison M. Macfarlane

Member

Dr. Allison M. Macfarlane is currently Professor and Director, School of Public Policy and Global Affairs, Faculty of Arts, UBC. Dr. Macfarlane has held both academic and government positions in the field of energy and environmental policy, especially nuclear policy. Most recently, she directed the Institute for International Science and Technology Policy at the George Washington University. She recently held a fellowship at the Wilson International Center for Scholars in Washington, DC and was Fulbright Distinguished Chair in Applied Public Policy at Flinders University and Carnegie Mellon Adelaide in Australia. The first geologist (and the third woman) to chair the U.S. Nuclear Regulatory Commission from 2012-2014, Dr. Macfarlane holds a doctorate in earth science from MIT and a bachelor's of science from the University of Rochester. She has held fellowships at Radcliffe College, MIT, Stanford, and Harvard Universities, and she has been on the faculty at Georgia Tech in Earth Science and International Affairs, at George Mason University in Environmental Science and Policy, and in the Elliott School of International Affairs at George Washington University. From 2010 to 2012 Dr. Macfarlane served on the White House Blue Ribbon Commission on America's Nuclear Future, created by the Obama Administration to recommend a new national policy on high-level nuclear waste. She has also served on National Academy of Sciences panels on nuclear energy and nuclear weapons issues, and she chaired the Science and Security Board of the Bulletin of Atomic Scientists, the group that sets the Bulletin's famous "doomsday clock." In 2006, MIT Press published a book she co-edited, *Uncertainty Underground: Yucca Mountain and the Nation's High-Level Nuclear Waste*. Dr. Macfarlane has published extensively in *Science*, *Nature*, *Environmental Science and Technology*, the *Bulletin of the Atomic Scientists*, and other journals. Dr. Macfarlane's research has focused on technical, social, and policy aspects of nuclear energy production and nuclear waste management and disposal as well as regulation, nuclear nonproliferation, and energy policy.

David K. Owens

Member

David Owens served as the Executive Vice President of Business Operations Group and Regulatory Affairs at Edison Electric Institute Inc. from October 1992 to June 2017. An executive with extensive experience in public policies concerning energy and utility operations, Mr. Owens is recognized as an industry expert on business transformation. After 36 years of service, he retired from the Edison Electric Institute, the association representing all U.S. Investor-owned electric companies. He was the first African-American to hold an officer title with the organization. He guided the association on issues affecting the future structure of the electric industry and the new rules in evolving competitive markets. He also spearheaded efforts to invest in the nation's electric infrastructure with new technology enhancing energy efficiency with smart buildings, smart meters and smart grids. He served as Chief Engineer for the Division of Rates and Corporate Regulation with the Securities and Exchange Commission where he actively participated in landmark proceedings involving utility mergers, electric integration issues and utility financial disclosure. A driving force behind the founding of the American Association of Blacks in Energy, he has mentored generations of young men in careers in energy. He has been a Director of Xcel Energy Inc., since August 22, 2017. On December 21, 2018, he was nominated to be an independent director of the Puerto Rico Electric Power Authority. He now serves as vice chairman. He is a recognized expert in the energy field and has been a leader in shaping constructive public policy frameworks to support the industry's transition to new and cleaner technologies. He served on Boards of the National Academy of Sciences and Chaired the National Institute of Standards and Technology Smart Grid Advisory Committee. He is a graduate of Howard University with a Bachelor and Masters of Engineering degrees, as well as a Masters in Engineering Administration from George Washington University.

James Rispoli

Member

James A. Rispoli, a licensed professional engineer in five states, is a Professor of Practice at the North Carolina State University. Additionally, he serves as a senior executive advisor for PT&C, LLC, an ENR-ranked engineering firm with over 30 years of experience serving owners in both operations and construction roles. Mr. Rispoli served as a career senior executive in the Department of Energy, and while Director, Office of Engineering and Construction Management, was invited by the Secretary to forego career status to accept a Presidential appointment. Thus, he served as an Assistant Secretary of Energy from 2005 through 2008, nominated by the President and unanimously confirmed by the United States Senate. Mr. Rispoli previously completed 27 years of service to the nation in the U.S. Navy, retiring as a Captain, Civil Engineer Corps. Subsequently, he was managing principal for an ENR top tier engineering firm and regional president of another top tier engineering firm in Hawaii, where his practice included multi-disciplinary engineering, environmental planning and engineering, and construction management. He left the private sector to join the Department of Energy's new Office of Engineering and Construction Management in 1999. Articles and papers written by him on various subjects in engineering and leadership have been published, including seven published in either an edited book, or a refereed journal; and he has lectured extensively domestically and internationally in Japan, China, Singapore, Italy and the United Kingdom. Jim serves on the Board of the North Carolina Coastal Studies Institute, as well as on the Department of Energy's Environmental Management Advisory Board. He earned his Bachelor of Engineering degree in Civil Engineering from Manhattan College, a Master of Science degree in Civil Engineering from the University of New Hampshire, and a Master's degree in business from Central Michigan University. He is a Distinguished Member of the American Society of Civil Engineers (ASCE), a member of the National Academy of Construction (NAC), a Board Certified Environmental Engineer (National Academy of Environmental Engineers and Scientists), and a licensed professional engineer in five States. He is a member of two permanent boards/committees of the National Academies of Sciences, Engineering and Medicine (NASEM), and is chair of one of them. He also recently served on a study committee of the NASEM's Nuclear and Radiation Studies Board. He is currently the chair of an ASCE committee charged with development of an ANSI standard on sustainable infrastructure. Mr. Rispoli has developed and teaches two graduate engineering courses at the North Carolina State University in Raleigh, NC, and initiated a curriculum for a graduate engineering concentration in facilities engineering which the College of Engineering is currently implementing.

Sola Talabi

Member

Dr. Sola Talabi is a principal with Pittsburgh Technical, which is a nuclear consulting firm that specializes in advanced reactor design and deployment. He is also an adjunct professor of nuclear engineering at the University of Pittsburgh and the University of Michigan. Sola's experience includes design, numerical computational analysis, manufacturing, installation and testing of nuclear power plant components. His experience includes serving as Risk Manager at Westinghouse Electric Company, where he was responsible for risk awareness, assessment and response for advanced reactors including AP1000 and SMR. He received the following degrees from Carnegie Mellon University: M.B.A., Ph.D. (Engineering and Public Policy) and M.Sc. (Mechanical Engineering). He received his B.Sc. in Engineering from University of Pittsburgh. Dr. Talabi is also a certified risk manager.

Steven J. Zinkle

Member

Dr. Steven Zinkle (NAE) is the Governor's Chair Professor for Nuclear Materials in the Nuclear Engineering and Materials Science & Engineering Departments at the University of Tennessee at Knoxville. Prior to joining the faculty at the University of Tennessee, he was chief scientist for Oak Ridge National Laboratory's (ORNL) Nuclear Science & Engineering Directorate and director of ORNL's Materials Science and Technology Division. He also served as director of ORNL's Metals and Ceramics Division, which merged into the Materials Science and Technology Division. Much of his research has utilized materials science to explore fundamental physical phenomena that are important for advanced nuclear energy applications, focusing on microstructure-property relationships. Dr. Zinkle's research interests include the investigation of deformation and fracture mechanisms in structural materials, physical metallurgy of structural materials, and the investigation of radiation effects in ceramics, fuel systems and metallic alloys for fusion and fission energy systems. He has written over 300 peer-reviewed publications, and is a member of the Condensed Matter and Materials Research Committee. He is a fellow of 7 professional societies including the American Nuclear Society (ANS), TMS (The Minerals, Metals & Materials Society), ASM International, the Materials Research Society, and the American Physical Society. He received a B.S. and M.S. in nuclear engineering, an M.S. in materials science, and a Ph.D. in nuclear engineering, all from the University of Wisconsin at Madison.