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

VIRTUAL MEETING #3 – Public Agenda
Monday and Tuesday, April 5-6, US EASTERN TIME

Register here: <http://advancednuclear.eventbrite.com>
[Watch live here](#)

NPP Construction: Lessons Learned, and New Ideas

Monday, April 5

10:00 – 10:10 a.m. Welcome and opening remarks

Richard Meserve, Committee Chair, and **Kasia Kornecki**, Study Director

****Each presentation will be ~20 minutes, followed by a ~30 minute Q&A with the study committee****

10:10 – 11:10 a.m.

Team Korea for Nuclear Projects

Hee Yong Lee, Former Executive VP, Korea Electric Power Corporation

11:10 – 12:10 p.m.

Small Modular Reactors: Tesla or Theranos?

Simon Marshall, Independent Nuclear Expertise, Ltd.

12:10 – 1:00 p.m. BREAK

1:00 – 2:00 p.m.

New Reactor Construction Lessons Learned

Frederick (Fred) Brown, Retired Director, Office of New Reactors, U.S. Nuclear Regulatory Commission

2:00 – 2:15 p.m. Public Comment Period

Public viewers can fill out the comment form from the link on the livestream page (<http://nationalacademies.org/deps-meeting-comments>). Time permitting, select comments will be read out loud. All comments will be made available to the committee and filed in the public record for this study.

2:15 p.m. Closing remarks and adjourn

Richard Meserve, Committee Chair

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NPP Construction: Lessons Learned, and New Ideas

Tuesday, April 6

10:00 – 10:10 a.m. Welcome and opening remarks

Richard Meserve, Committee Chair, and **Kasia Kornecki**, Study Director

****Each presentation will be ~20 minutes, followed by a ~30 minute Q&A with the study committee****

10:10 – 11:10 p.m.

AI/ML Driven Innovation for High Precision Construction, Inspections, and Management

Abhinav Gupta and Kevin Han, Center for Nuclear Energy Facilities and Structures, NC State University

11:10 – 12:10 p.m.

Digital Engineering to Accelerate Advanced Reactor Development

Chris Ritter, Director, Digital Innovation Center, Idaho National Laboratory

12:10 p.m. – 1:00 p.m. BREAK

1:00 – 2:00 p.m.

Megaprojects Don't Have to Fail

Ed Merrow, CEO, Independent Project Analysis, Inc., member of the National Academy of Construction

2:00 p.m. – 3:00 p.m.

Pitfalls of Large Complex Projects

Joseph Brewer, Dow Chemical VP & Senior Project Delivery Consultant (Retired), member of the National Academy of Construction

3:00 – 3:15 p.m. Public Comment Period

Public viewers can fill out the comment form from the link on the livestream page

(<http://nationalacademies.org/deps-meeting-comments>). Time permitting, select comments will be read out loud. All comments will be made available to the committee and filed in the public record for this study.

3:15 p.m. Closing remarks and adjourn

Richard Meserve, Committee Chair

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Speaker Biographies

Hee Yong Lee is a leading expert in the areas of nuclear power, power plant construction, and energy related overseas investment and project financing. He has joined Lee & Ko as an advisor for the firm's Construction and Project Finance Practice Groups, as well as the firm's Energy and Natural Resources Practice Group, among others. Prior to joining Lee & Ko, Mr. Lee served with distinction as top executive of the Korea Electric Power Corporation (KEPCO), where he held positions of Executive Vice President and Chief Nuclear Officer, as well as other senior management positions. Among his many accomplishments as a leading executive in the energy sector, Mr. Lee is highly respected for his excellent track record and extensive experience in the areas of strategic Planning, international business development, project management, and development of business models for overseas export, construction, and servicing of NPPs and related technologies. One of the key projects managed by Mr. Lee was the delivery of four APR 1400 NPPs to the UAE under contract with Emirate Nuclear Energy Corporation. KEPCO was the prime contractor responsible for engineering, procurement, construction, and commissioning of these four NPPs.

Simon Marshall is a graduate of physics at Manchester University (UK). He joined the nuclear industry in 1979 where he spent his early career in the nuclear fuel business both in the UK at Springfields and Sellafield, and then overseas in Sweden, South Africa, and the United States. His experiences include: PBMR fuel manufacture in South Africa; gaining interim Design Acceptance Confirmation for the AP1000 reactor from the UK Office for Nuclear Regulation; the Westinghouse EPC bid for the supply for three AP1000 reactors at the Wylfa site to Horizon; the Toshiba/NuGen programme for three AP1000 reactors at Moorside; the deployment options for the AP1000 in Bulgaria; and the deployment options for the Westinghouse SMR in the UK. In 2016, Mr. Marshall was appointed as Managing Director, Westinghouse UK Fuel Operations, responsible for the operation of the Springfields nuclear fuel manufacturing site. He retired from Westinghouse in 2018 and now provides independent subject matter expertise to companies and academia.

Frederick (Fred) Brown has 37 years of experience as an engineer and a leader. He retired as the Director of the Office of New Reactors (NRO) at the U.S. Nuclear Regulatory Commission (NRC) in October, 2019. He is currently the owner of FDB Consulting Services LLC. Fred had supervisory or executive roles in nearly all the programmatic areas under NRC regulatory jurisdiction, including: power reactors; the fuel cycle; high-level waste; and medical and industrial materials. He also oversaw many corporate and administrative functions, including human resources, information technology, and facilities. Immediately prior to serving as Director of NRO, Fred was the Deputy Executive Director for Research, Materials, Waste, Enforcement, Investigations, and corporate functions. Earlier executive roles at NRC included being the Deputy Regional Administrator for all new Reactor and Fuel Facility Construction in the United States, Deputy agency Chief Information Officer (CIO) and Acting CIO, and Director of the Division of Inspection and Regional Support. Fred was also a member of the initial executive leadership team that assembled the newly established NRO in 2007. Earlier in his career at NRC, Fred served as a resident inspector at a fuel cycle facility and as a senior resident inspector at a nuclear power plant. Fred started his career at Mare Island Naval Shipyard, where he did system design engineering work. Fred graduated, with honors, from the U.S. Merchant Marine Academy. He was previously licensed as a Third Mate, any tonnage, any ocean, and as a Third Assistant Engineer, steam and diesel, any horsepower. He holds a current registration as a Professional Engineer (Mechanical) in California.

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Abhinav Gupta is Director of Center for Nuclear Energy Facilities and Structures (CNEFS) at NC State University. Major utilities and nuclear energy organizations around the world such as Dominion Energy, EDF-France, and KHNP-South Korea sponsor research at CNEFS. Presently, he is also serving as the President of International Association of Structural Mechanics in Reactor Technology (IASMiRT). Gupta's research has focused on facilitating the construction and operation of advanced nuclear reactors as well as operating the current fleet. He, along with his colleagues, is working on developing innovative technologies based on AI/ML and augmented reality concepts for high-precision construction and integration of design and construction. He is also working on development of nearly autonomous systems for advanced reactors utilizing the power of digital twin technology. He has more than 20 years of experience in developing new computational and probabilistic models needed for improving the safety and for reducing the operation, maintenance and construction costs associated with structures, systems, and components. He was a member of ASME's five person team to explore the benefits of risk-informed design methodology for updating the piping design equations in Section III of the ASME Boiler Pressure Vessel and Piping Code. He was the recipient of the Outstanding Paper Award in the seismic division at the 2005 ASME-Pressure Vessel and Piping Conference. He chaired the highly successful SMiRT 25 conference held in 2019 at Charlotte, NC. He has served as the Chair of ASCE's Technical Committee on Emerging Computing Technologies, as Associate Editor for ASCE's Journal of Structural Engineering, and as a Visiting Faculty at US Nuclear Regulatory Commission. In 2010, he was inducted into the Academy of Outstanding Teachers at NC State University.

Kevin Han is an Assistant Professor in the Department of Civil, Construction, and Environmental Engineering and the Center for Nuclear Energy Facilities and Structures at North Carolina State University. His research focuses on automating large-scale (i.e., nuclear energy facilities) construction engineering and management through advances in robotics, visual data analytics, and building information modeling. During his five years at NC State, he has managed over \$3.9 million in research grants as the principal investigator. His work has been recognized through best paper and poster awards at ASCE academic conferences. He has served as the co-chair and coordinators of various technical tracks and divisions of academic and industry conferences, including "Construction Management, Cost, Scheduling, and Insurance" at International conference on Structural Mechanics in Reactor Technology (SMiRT) and "Automation in Construction" at Construction Research Congress (CRC).

Chris Ritter is the Director of the Digital Innovation Center of Excellence and the Group Lead with the Digital and Software Engineering group at Idaho National Laboratory. He currently leads digital engineering on the Versatile Test Reactor, National Reactor Innovation Center, and NNSA digital twin programs. His expertise is in software engineering, systems engineering, leading software teams, systems engineering software integration, and cloud architectures. Before coming to INL, he was Director of Software Development at SPEC Innovations in Manassas, Virginia. He served as the Chief Architect of Innoslate, a popular systems engineering tool that leverages elastic cloud technologies and AI/NLP for high scalability and advanced analytics. He architected the software system, consulted on the data ontology for a centralized mission risk management system for the Joint Staff at the Pentagon, and supported Marine Corps business process reengineering for its Capability Portfolio Management processes. He was also a computer programming teacher at St. Michael's Academy in Warrenton, Virginia and developed an elementary school computer programming curriculum. He holds a bachelor's degree in computer science from Virginia Polytechnic Institute and State University.

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Joseph Brewer is a 41-year veteran of the process and petrochemical industries. An engineering honors graduate student of Texas A&M University, he began his career at the Exxon Refinery in Baytown, Texas, his home town. He joined Dow Chemical in 1980 and served in various positions and locations, primarily in large capital project execution management and leadership roles. The last one-third of his career was spent leading successful large projects in the Middle East which included the Olefins 2 Expansion JVV mega-project in Kuwait, and the Sadara JV giga-project in Saudi Arabia. Joseph is now retired from Dow and continues to actively support the industry through his membership in the National Academy of Construction, and as consultant, speaker, and author. He has most recently published his book titled, *When Mega Goes GIGA – The Rocket Ride on Dow & Aramco’s Record-Setting Project*. It’s the story of the Sadara Project, the largest petrochemical project ever, and its many lessons learned.

Ed Merrow is the Founder, President, and CEO of Independent Project Analysis, Inc. (IPA), the global industry leader in quantitative analysis and benchmarking of project management systems. After receiving his degrees from Dartmouth College and Princeton University, Merrow began his career as an Assistant Professor at the University of California Los Angeles, followed by 14 years as a research scientist at The Rand Corporation where he directed the Energy Research Program. He is a recognized expert on the development and commercialization of new process technologies and management of large and complex projects. He is also the author of two books, *Industrial Megaprojects and Leading Complex Projects*, with a third book coming soon on how contracting strategies and delivery systems shape project results.