Summit:
Commercializing Small Modular Reactors for Domestic and International Markets

Day 1
Wednesday, July 18, 2012

7:45-8:50 *Registration and Networking Breakfast*

8:50-9:00 *Welcome and Opening Remarks by Summit Chair*
Phil Young, *Technical Manager,* TETRA TECH

Prospective Markets for SMR Technologies

9:00-9:45 Presentation: **Potential Role for SMRs in Meeting Military Net-Zero Requirements—Plans, Programs and Initiatives**
The military is rolling out large-scale plans to meet net-zero energy and other goals for installations. Can SMRs play a role in reducing carbon emissions at military installations? What time frames and scales are envisioned for military clean energy programs?

- What do they see as the likelihood of adopting SMRs?
- What advantages do SMRs provide?
- What kind of cost structure might be viable?
- What contracting structures are likely to be utilized?
- What operational and maintenance issues might be of concern?

Presenter
Colonel Paul E. Roege, *Chief, Operational Energy Office,* US ARMY DEPUTY CHIEF OF STAFF, G-4

9:45-10:15 *Networking Break*

10:15-11:15 Panel Discussion: **Utilities' Perspectives on Drivers for Adoption of SMR Technology**

From a utility's perspective, the development of traditional nuclear power is limited by its high cost, large size and operational issues. However, many utilities will need to replace coal-fired baseload generation in response to environmental regulations and standards, but their options are often limited because of the size and location of existing units. This panel will provide their perspectives on the potential application of SMR technology for both current nuclear operating utilities and those without operating expertise.

- Merits of SMRs vs. coal vs. natural gas fired generation
- Diversity in generation sources
- At what price point will SMRs become attractive?

Moderator

Edward Kee, *Vice President,* NERA ECONOMIC CONSULTING

Panelists

Greg Halnon, *Director, Regulatory Affairs,* FIRSTENERGY NUCLEAR OPERATING COMPANY

David Mohre, *Executive Director, Energy & Power Division,* NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

Warren Wood, *Vice President for Regulatory and Legislative Affairs,* AMEREN MISSOURI

11:15-12:15 Panel Discussion: **Non-Utility Markets for SMR Technology*: Remote Populations, Industrial Applications and Heat***

SMRs have the potential of revolutionizing the supply of power to populations in areas such as islands and remote villages, as well as to power petrochemical processing and other energy-intensive industries. This panel of potential customers will discuss their requirements and possible applications for small modular reactors. Topics they will address include:

- What do they see as the drivers for potentially implementing SMRs?
- What do they see as the likelihood of adopting SMRs?
- What advantages do SMRs provide?
- What kind of cost structure might be viable?
- What operational and maintenance issues might be of concern?

Moderator

Jonathan Hinze, *Senior Vice President, International,* UX CONSULTING

Panelists

Dr. Richard Andres, *Professor of National Security Strategy*, NATIONAL WAR COLLEGE; *Senior Fellow and Energy Security Chair*, NATIONAL DEFENSE UNIVERSITY

Dr. Soheil Asgarpour, *President,* PETROLEUM TECHNOLOGY ALLIANCE OF CANADA
Dr. Paul Farrell, *CEO,* RADIX POWER AND ENERGY CORPORATION
Philip Moor, *Owner,* PO MOOR & CO; *SMR Committee Chairman,* AMERICAN NUCLEAR SOCIETY

12:15-1:45 *Group Luncheon*

1:45-2:30 Presentation: **SMRs and the Back-end of the Nuclear Fuel Cycle**
SMRs present both challenges and the potential for major breakthroughs for managing the back end of the nuclear fuel cycle. How can the waste management and nuclear security issues be managed over a potentially more dispersed fleet of SMRs? Can their potential for a long-term solution to many waste management issues be realized? This panel will examine these and other issues.
Presenter
Andrea Jennetta, *Publisher,* FUEL CYCLE WEEK

2:30-3:00 *Networking Break*

Leveraging and Sustaining Government Support for SMRs

3:00-3:45 Presentation: **Establishing an SMR Licensing Process**
The DOE FOA will support the licensing of two, most likely LWR, SMR designs. The NRC initially appeared to be requiring SMRs to undergo the same design licensing and siting processes as for traditional LWRs, which would impose site and other standards out of proportion to the smaller sized SMRs. Where do we stand on the licensing process? What annual fee and other amendments are possible? Will licensing standards be developed for non-LWR designs? What can industry do to kick-start the process?
Presenter
Edward M. Burns, *Senior Regulatory Consultant,* INDUSTRY SMR PROGRAMS

3:45-4:30 **Commercialization Needs for Technology**
Many intriguing SMR designs are emerging from the laboratories using novel technologies that may cost-effectively target widespread applications throughout the world. This presentation will discuss licensing concerns with non-LWR reactors, SMR designs, potential applications, and what they might need to become commercially viable.
Presenter
Dr. Tim Bertch, *Director of the Fission Division,* GENERAL ATOMICS

4:30 *Summit Day 1 adjourns*

Day 2

Thursday, July 19, 2012

7:00-7:50 *Networking Breakfast*

7:50-8:00 *Welcome and Opening Remarks by Summit Chair*
Phil Young, *Technical Manager,* TETRA TECH

Public-Private Partnerships to Commercialize SMRs

8:00-9:00 Panel Discussion: **LWR Small Modular Reactor Developers' Perspectives on Commercialization Needs**

A limited number of LWR reactor designs are expected to compete for the DOE FOA. This panel will discuss their SMR designs, the road forward towards licensing, potential markets and what will be necessary to achieve economies of replication and operation.

- The safety features built into their designs
- What traditional and novel applications they are targeting
- Will SMRs be proposed to replace large reactors?
- What economies of replication and operation do they expect to see?
- Will getting US regulatory approval be necessary to attract international buyers?
- Roles that engineering firms, EPC contractors and others might play in the commercialization of SMR technology
- Roles that manufacturers and others might play in the SMR value chain
- What they are looking for in potential public and private partners
- Importance of the business case

Moderator:

Paul H. Genoa, *Senior Director, Policy Development,* NUCLEAR ENERGY

Panelists:

Layla Sandell, *Manager, Small Modular Reactor Business Development,* WESTINGHOUSE ELECTRIC COMPANY

J. Darren Gale, *Vice President of Product Development,* GENERATION MPOWER

Dr. Corey McDaniel, *Director of International Marketing,* NUSCALE POWER

9:00-10:00 Panel Discussion: **National Labs' Role in Commercializing SMR Technologies**

The National Labs are poised to assist in the commercialization of SMR technologies. Their potential contributions range from providing technical support and facilities to test SMR designs to potentially becoming customers for power generated by the first wave of SMRs. This panel, in addition to reviewing the potential for creating an SMR Energy Park, will discuss other relevant issues and the latest DOE labs' activities in support of SMR commercialization.

- An update on SRS Energy Park activities
- An update on ORNL M&S lab

- An update on INL's activities
- An update on PNNL collaboration with NRC

Moderator
David Blee, *Executive Director,* U.S. NUCLEAR INFRASTRUCTURE COUNCIL
Panelists
Phillip Finck, Ph.D, Chief Nuclear Research Officer, IDAHO NATIONAL LABORATORY
Bruce McDowell, *Senior Technical Lead, Radiological Science and Engineering Group,* PACIFIC NORTHWEST NATIONAL LABORATORY
Dr. Terry Michalske, *Director,* SAVANNAH RIVER NATIONAL LABORATORY

10:00-10:30 *Networking Break*

10:30-11:30 Panel Discussion: **Perspectives of Non-LWR and Advanced SMR Technology Developers on Commercialization Needs**
Many intriguing SMR designs are emerging from the laboratory and are being developed by entrepreneurial start-up companies. These designs focus on using novel technologies that may cost-effectively target widespread applications throughout the world. This panel will discuss their SMR designs, potential applications for their technologies, and what they might need to become commercially viable.

- Novel design concepts and potential applications
- Key technological challenges they face
- Potential for teaming and joint ventures
- Capital needs and potential for investment
- What they are looking for in potential partners
- What recruiting and personnel training issues are anticipated
- Importance of the business case

Moderator
Elina Teplinsky, *Senior Associate,* PILLSBURY WINTHROP SHAW PITTMAN LLP
Panelists
Dr. Tim Bertch, *Director of the Fission Division,* GENERAL ATOMICS
John Kutsch, *Executive Director,* THORIUM ENERGY ALLIANCE
Bob Prince, *Chief Executive Officer,* GEN4 ENERGY, INC.

11:30-1:00 *Group Luncheon*

Economics and Financing of SMR Technologies and Fleets

1:00-2:00 Panel Discussion: **Achieving Economies in SMR Project Development and Completion**
Successfully commercializing SMRs can only be achieved via a business case that reduces the costs of first-of-a-kind engineering while integrating design and

manufacturing. This panel will explore how manufacturing models can drive down cost and supply chain issues relative to traditional nuclear developments.

- How can the integration of design and manufacturing generate viable first-of-a-kind projects?
- Can efficient manufacturing factory models from the defense sector ensure commercial success?
- Challenges of creating an SMR module factory
- Potential for job creation through SMR manufacturing and supply chain
- Type of licensing needed for SMR factories—how could existing NRC regulations best be adapted?

Moderator

Reiner Kuhr, *Senior Executive Consultant,* SHAW CONSULTANTS INTERNATIONAL

Panelists

David Blee, *Executive Director,* U.S. NUCLEAR INFRASTRUCTURE COUNCIL
Chris Crosby, *Business Development Executive, Global Nuclear Energy Market,* OSISOFT, LLC
David Kompare, *Program Manager,* GENERAL DYNAMICS ELECTRIC BOAT
Gary L. Wolski, *Vice President, Nuclear Group,* CURTISS-WRIGHT FLOW CONTROL COMPANY

2:00-2:30 *Networking Break*

2:30-3:30 Panel Discussion: **Can Supportive State Policies Accelerate SMR Development?**

What roles can state and local governments play in supporting the development of SMR technology? What political and other challenges will be faced? Will State PUCs aid the cost recovery for SMRs?

Moderator:

Paul H. Genoa, *Senior Director, Policy Development,* NUCLEAR ENERGY INSTITUTE

Panelists

Tim Echols, *Chairman,* GEORGIA PUBLIC SERVICE COMMISSION
Darrell Hanson, *Commissioner,* IOWA UTILITIES BOARD
Patrick J. Oshie, *Commissioner,* WA UTILITIES & TRANSPORTATION COMMISSION

3:30-4:30 Panel Discussion: **Financeability of SMR Technology**

SMRs address one of the largest hurdles for the financing of nuclear projects: the effect of the large initial capital requirements on the Net Present Value and ROI of the investment. However, their new business models means that financiers must develop new measures to evaluate the financeability of SMR plants. This panel of investment bankers and other financiers will provide their perspectives on:

- Key areas of risk and opportunity
- Could small reactors be considered as a replacement for large reactors?
- The key hurdles to getting financed

- Whether or not getting international regulatory approvals provides enough certainty to finance overseas projects

Moderator

Edward Kee, *Vice President,* NERA ECONOMIC CONSULTING

Panelists

Amir Kouhestani, *Chief Executive Officer,* LAKECHIME PPRS INC.

Bob Percopo, *Executive Vice President – Project Finance Advisory Services,* AIG CHARTIS

Joseph C. Perkowski, Ph.D., *Manager of Energy Initiatives, IDAHO NATIONAL* LABORATORY

4:30 *Summit Day 2 adjourns*