The Role of Nuclear Power in Global and Domestic Energy Policy:

Recent Developments and Future Expectations

Presented by:

The Howard H. Baker Jr. Center for Public Policy

and the

Woodrow Wilson International Center for Scholars

October 3-4, 2007 Washington, D.C.

Rapporteur Report by:

Lisa Obrentz

Council on Foreign Relations, Woodrow Wilson International Center for Scholars

Jerry Paul

Howard H. Baker Jr. Center for Public Policy, University of Tennessee

Alan Lowe

Howard H. Baker Jr. Center for Public Policy, University of Tennessee

THE UNIVERSITY of TENNESSEE KNOXVILLE HOWARD H. BAKER JR. CENTER FOR PUBLIC POLICY

Woodrow Wilson International Center for Scholars

TABLE OF CONTENTS

Introduction and Context.....5

Attendees.....5

Opening Remarks.....6

Alan C. Lowe – Howard H. Baker Jr. Center for Public Policy 6
Hon. Lamar Alexander – U.S. Senator, R-TN 6
Hon. Lee H. Hamilton – Former U.S. Representative; Director of theWoodrow Wilson International Center for Scholars 6
Hon. Marsha W. Blackburn – U.S. Representative, R-TN 6

The Role of Nuclear Power in Global and Japanese Energy Policy.....7

Hon. Shunsuke Kondo – Japan Atomic Energy Commission 7

A Responsible Path Toward Nuclear Energy Development 7

Hon. Alain Bugat – French Atomic Energy Commission 7
Leonard S. Spector - Deputy Director, Monterey Institute of International Studies 8

Keynote Address..... 9

Hon. Howard H. Baker – Former U.S. Senator, R-TN 9

What Role Does Nuclear Energy Play in Global Climate Change Policy? 9

Patrick Moore – CASEnergy Coalition, Greenspirit Strategies..... 9
Steve Fetter – University of Maryland 9

The Economics of International Supplier State and Recipient State Regimes for Worldwide Nuclear Fuels Services.....10

Geoffrey Rothwell – Stanford University 10

Nonproliferation Aspects of Expanded Nuclear Energy 10

Hon. Larry W. Brown – Defense Nuclear Facilities Safety Board 10
Daniel B. Poneman – The Scowcroft Group, The Forum for International Policy 11

Building International Cooperation in Nuclear Energy..... 12

Ambassador Robert Joseph – Former Under Secretary of State for Arms Control and International Security; Former Special Assistant to the President for Proliferation Strategy, Counterproliferation, and Homeland Defense 12

TABLE OF CONTENTS

Opening Remarks 13

Hon. Bob Corker – U.S. Senator, R-TN 13
Hon. Zach P. Wamp – U.S. Representative, R-TN 13

The Economics and Financing of New Nuclear Power Plants: A Financial Community Perspective. 13

James K. Asselstine – Lehman Brothers, Inc. 13

The Nuclear Fuel Cycle in America – Present and Future 14

Hon. Dennis Spurgeon – U.S. Department of Energy 14

Panel Discussion: New Nuclear Plant Development Decision Making – Perspectives from the Boardroom 15

Admiral Skip Bowman – Nuclear Energy Institute 15
J. Barnie Beasley – Southern Nuclear Company 15
Michael J. Wallace – Constellation Energy, Constellation Energy Nuclear Group, UniStar Nuclear Energy 15
Bill McCollum – Tennessee Valley Authority 16
Marilyn Kray – Exelon Nuclear, NuStart Energy Development, LLC 16
Tom Flaherty – Booz Allen Hamilton 16

Remarks 17

Hon. Dale Klein – U.S. Nuclear Regulatory Commission 17

Keynote Address 18

Hon. Samuel W. Bodman – Secretary of Energy, U.S. Department of Energy 18

Alternative Views – Considering the Critique of Nuclear Power 19

Eugene A. Rosa – Washington State University 19
Charles D. Ferguson – Council on Foreign Relations 19

Nuclear Power Plant Security: A Discussion of Realities, Concerns and Conclusions 20

Jerry Paul – Distinguished Energy Fellow, Howard H.Baker Jr. Center for Public Policy 20

The American Nuclear Renaissance: What's at Stake for Jobs, the Environment, and Economic Growth 21

Hon. J. Bennett Johnston – Former U.S. Senator, D-LA 21
Adam Sacks – Oxford Economics *21*

TABLE OF CONTENTS

Panel Discussion: The Evolving Nuclear Power Supply Chain *22*

Steve Tritch – Westinghouse 22
Richard E. Reimels – The Babcock & Wilcox Companies Nuclear Power Generator Group.....22
Steve Creamer – EnergySolutions 23
Thomas A. Christopher – AREVA NP, Inc. 23
Steven Hucik – General Electric-Hitachi Nuclear Energy 23
Farzad Rahnema – Georgia Institute of Technology 23
John K. Welch – United States Enrichment Corporation (USEC) Inc. 23

Concluding Remarks *24*

Jerry Paul - Distinguished Energy Fellow, Howard H. Baker Jr. Center for Public Policy.....24

Speaker Biographies.....*25*

Program Agenda.....*34*

The Role of Nuclear Power in Global and Domestic Energy Policy:

Recent Developments and Future Expectations

October 3-4, 2007 Washington, D.C.

Introduction and Context

The Howard H. Baker Jr. Center for Public Policy at the University of Tennessee and the Woodrow Wilson International Center for Scholars held a two-day conference in Washington, D.C. that explored the present and future roles of nuclear power in the global and domestic energy policy. Bringing together policymakers, experts, and industry representatives, this conference placed a specific emphasis on recent developments and future expectations for nuclear power.

The following is a brief summary of the remarks presented by speakers and panelists. Also attached are biographies of all speakers and the full program agenda.

The first day had an international focus concentrating on the progress to date and next steps for the emerging global nuclear energy market. Emphasis was placed on discussing the key partnerships and necessary arrangements to ensure participating countries contribute in ways that optimize their strategic goals and unique assets. Also highlighted were the economics of a global nuclear energy marketplace both from the perspectives of major nuclear supplier states and potential recipient states.

The sessions on the second day focused on domestic nuclear power plant development, progress to date, next steps, and potential barriers. Some emphasis was placed on economics and financing. A key question at the core of many presentations was how U.S. interests can best position themselves to participate in the global nuclear infrastructure supply chain. Most speakers agreed that safety, security, cleanliness, and reliability are the essential components of future nuclear energy both domestically and abroad.

Attendees

More than 100 persons attended representing diverse perspectives including members of Congress, Congressional staff, U.S. executive branch agency officials and staff, and state officials and regulators as well as many from academic institutions, private sector companies worldwide, non-government organizations, and national laboratories.

Photo by Howard Baker Center / Nissa Dahlin-Brown

Speaker Presentations – October 3, 2007

Opening Remarks

Alan C. Lowe – Executive Director, Howard H. Baker Jr. Center for Public Policy
Mr. Lowe welcomed participants and described the mission and activities of the Baker Center. He noted the importance placed by the Baker Center on issues related to energy policy and described some of the activities the Center is taking to advance the discussion of energy policy alternatives. He discussed how the conference would take a close look at the current and future role of nuclear power in the energy policies of America and other nations. Lastly, he thanked the Wilson Center for its partnership, conference sponsors for their support, and all speakers and audience members for taking part in the conference.

Hon. Lamar Alexander – U.S. Senator, R-TN
Senator Alexander underscored the role in which nuclear power currently plays in the U.S. energy supply. He suggested that nuclear energy must continue to play a significant role and should even increase in order to keep up with annual increases in electricity demand. He also mentioned that there could be anywhere from 25 to 100 new nuclear power plants in the United States in the next 25 years in part as a result of capping carbon dioxide emissions.

According to Sen. Alexander, we must be realistic about our needs because the United States, which consumes 25% of energy worldwide, will set the example for other nations to follow. He pointed out that, while taking other factors into consideration such as proliferation risks and waste management, the most viable options for large amounts of clean energy at low costs are nuclear power and conservation. He stated that the topic of nuclear power has been shelved because of a negative public opinion, even though there has been a 100% safety record for navy nuclear reactors, for example, since the 1950's.

Hon. Lee H. Hamilton – President and Director, Woodrow Wilson International Center for Scholars
Mr. Hamilton said nuclear power must be carefully examined because of a variety of concerns such as melting Arctic ice levels, the volatility of oil producing countries, and the global increase in demand for electricity. He stressed the significance of preventing nuclear proliferation.

Hon. Marsha W. Blackburn – U.S. Representative, R-TN
As a member of the House Energy and Commerce Committee, Representative Blackburn, who represents the 7th Congressional District in Tennessee, listed the benefits of nuclear power as a clean, emission-free, and domestic source of energy. She posed the question, "What are we doing to plan for a 40% increase in the demand for energy over the next 25 years?" According to Representative Blackburn, the current Congressional leadership is focused on renewables. She offered the view that renewables alone cannot satisfy our energy demands and will actually drive the United States to become more dependent on foreign sources of energy.

Rep. Blackburn stated that regulatory schemes have restrained the construction of new nuclear power plants, and new bills and amendments remedying these problems are consistently voted down by the new majority in Congress.

The Energy Policy Act of 2005 encouraged the expanded use of nuclear power and was the catalyst for investment, which has resulted in the first application for a new plant construction. Because the U.S. economy depends on access to clean affordable energy, we should encourage new nuclear options in order to become independent of foreign sources and deal with carbon emissions.

The Role of Nuclear Power in Global and Japanese Energy Policy

Hon. Shunsuke Kondo – Chairman, Japan Atomic Energy Commission

Photo by Howard Baker Center / Nissa Dahlin-Brown

In his presentation, Dr. Kondo stressed that the public is the key to nuclear power. There must be success in fostering a public understanding of the characteristics of nuclear energy in: 1) The economic dimension including energy cost and supply stability; and 2) The environmental dimension including points such as the low health impact, small waste amount, rarity of severe accident.

The objective of Japanese nuclear energy policy is to maintain or exceed the share of nuclear power in electricity generation at the current level of 30-40% after 2030. Mr. Kondo noted that, in May 2007, former Japanese Prime Minister Shinzo Abe presented a new initiative on Global Warming called "*Cool Earth 50*," a plan based on short, mid, and long-term goals. In the short term focus will be on the construction of new power plants, maintaining public trust, improving the operation of current plants, and solidifying plans for high-level waste disposal. In the mid-term, Japan aims to promote research and development in innovative technologies for light water reactors. Finally, in the long-term, emphasis will be placed on promoting the research and development of fast breeder reactor technologies and the associated advanced fuel cycle.

Dr. Kondo gave an update on the aftermath of the July 2007 earthquake that shook Japan. He pointed out that the reactor units were in automatic shutdown, inspections are currently underway, and no significant damage has been determined so far.

Dr. Kondo also called for international cooperation within the nuclear nonproliferation regime, joint efforts for innovation, and cooperation with the emerging international business environment. He especially underscored the need for international harmonization of specifications to nuclear safety, security, and nonproliferation. In order to cope with the globalizing market, Japan must ensure the future viability of its reactors and contribute to strengthening the international business market.

The pursuit of these goals includes supporting infrastructure development through the internationalization of the nuclear business and participating in efforts for coordination through bilateral (United States, France, China, Kazakhstan, Uzbekistan, Vietnam, Indonesia, etc.) and multilateral (IAEA, FNCA, GNEP, etc.) channels.

A Responsible Path Toward Nuclear Energy Development

Hon. Alain Bugat – Chairman, French Atomic Energy Commission

Mr. Bugat provided the French view on the role of nuclear power stating that a renaissance is indeed taking place. After presenting the role of nuclear energy in France including 58 reactors, 63 gigawatts capacity, and 80% of total electricity generation, Mr. Bugat explained that the best way to address the spent fuel

issue is through a closed fuel cycle, recycling used nuclear fuel to reduce waste volume, minimize toxicity, and harvest valuable energy remaining in the fuel.

France has a strong political commitment to safe and secure facilities, overall public acceptance, and a stringent legal framework. The safety of nuclear development is the duty of nation states. Society needs robust nonproliferation objectives, rigorous sustainable waste management policies, education and training of scientists, and designs practical for decommissioning. It is possible to harmonize and design standards for future plants, and this should be pursued through strong multinational research and development.

Photo by Wilson Center/Heidi Fancher

Mr. Bugat opined that by introducing mechanisms limiting the spread of enrichment capabilities, the U.S.-initiated Global Nuclear Energy Partnership (GNEP) will allow aspiring nuclear countries to rely on their international partners and take full advantage of available technologies for future needed energy supply.

Leonard S. Spector – Deputy Director, Monterey Institute of International Studies

Mr. Spector served as a discussant to Mr. Bugat's presentation. Mr. Spector described the changing dynamics of Russia's approach to reactor construction and fuel cycle activities. Through joint mining ventures, Russia hopes to build a tight enterprise with Kazakhstan and Ukraine; although both of those nations are concerned about falling under Russia's dominance and are signing deals with France and other countries. Russia, in turn, cannot rely on the Newly Independent States and, therefore, has signed a uranium deal with Australia.

In terms of the overall economics of nuclear energy, Mr. Spector explained that the nuclear option would fare better if the costs were better understood. He pointed out that the costs are difficult to assess because of 1) government ownership in the nuclear industry clouds nuclear economics in such countries as France, Russia, and the U.K.; 2) interests rates set by central banks affect power plant costs, for example, by escalating the costs of fuel and of the permanent disposal of high level waste; 3) liability issues; and 4) reprocessing and recycling costs.

The U.S. Department of Energy claims there is no reliable estimate of the cost of a nuclear power plant because there have been no new orders since the 1970s. Contradictory results have emerged from attempts to calculate accurate costs. Mr. Spector, without advocating for or against nuclear energy, called for greater clarity.

Keynote Address

Hon. Howard H. Baker – Former U.S. Senator, R-TN

In his keynote address, Senator Baker focused on facing the reprocessing, disposal, and environmental costs of nuclear energy. In order to internalize the costs of power production, it is key to know its competitive advantage and real costs.

Sen. Baker stated that nuclear power, while potentially dangerous and devastating, offers enormous benefits for mankind. It will not and should not go away and will serve as the energy backbone for the next few decades. The United States should build on the experience of France, Japan, Russia, China, and India and take advantage of the lessons learned.

Photo by Howard Baker Center / Nissa Dahlin-Brown

What Role Does Nuclear Energy Play in Global Climate Change Policy?

Patrick Moore – Co-Chair, CASEnergy Coalition; Chair and Chief Scientist, Greenspirit Strategies

Dr. Moore began by chronicling his past role as co-founder of Green Peace and noted that many have incorrectly disregarded the benefits of nuclear energy and its acceptance in sectors such as medicine. Citing his concerns about climate change, he noted that nuclear energy does not contribute to greenhouse gas emissions in sharp contrast to fossil fuels. He also discussed geopolitical benefits, arguing that nuclear energy reduces U.S. dependence on other oil-producing states. Because renewable energy sources alone, such as solar and wind, cannot supply adequate amounts of zero-emission electricity supply, there must be a combination of those sources and nuclear energy.

Dr. Moore suggested that spent nuclear fuel should be managed securely and carefully to limit the environmental impact. This can be achieved by establishing interim storage sites.

Photo by Howard Baker Center / Nissa Dahlin-Brown

In his conclusion, Dr. Moore recommended that the environmental movement determine an energy policy in line with climate change policy and move away from the anti-nuclear line it has followed since the 1970s.

Steve Fetter – Dean, School of Public Policy, University of Maryland

As a discussant to Dr. Moore's talk, Dr. Fetter stated that the focus of energy policy should be stabilizing carbon dioxide concentrations in the atmosphere. He noted that we cannot pick winners and losers in terms of energy sources because we cannot predict what will happen in thirty or forty years.

He stated his view that no special subsidies for any energy source should be allocated and a level playing field should be created for all sources. Instead he recommended a carbon tax, a cap-and-trade carbon permit system, or, failing that, subsidies based solely on the avoidance of carbon emission.

In Dr. Fetter's opinion, GNEP will not decrease the threat of nuclear proliferation. He pointed out that, although providing fuel services could limit the spread of enrichment and reprocessing facilities, the United States and Russia cannot dictate who will participate in these voluntary arrangements. The key incentive is the take-back of spent fuel, but the United States' promises to take back spent fuel are not credible, so there is a need for international repositories.

The Economics of International Supplier State and Recipient State Regimes for Worldwide Nuclear Fuel Services

Geoffrey Rothwell – Associate Director of Public Policy; Director of the Honors Program in the Department of Economics and the Public Policy Program, Stanford University

In his presentation, Dr. Rothwell described GNEP as a means to encourage the international expansion of nuclear power and develop international capabilities. This in turn will lead to an increase in demand for nuclear fuel services. He warned that, through an expansion in supply of nuclear fuel, the program could also lead to possible reprocessing to extract weapons grade plutonium.

Photo by Howard Baker Center / Nissa Dahlin-Brown

Dr. Rothwell raised a number of uncertainties surrounding GNEP:

- If fast reactors are more expensive than light water reactors, who will build them?
- Does GNEP provide the correct economic incentives to encourage non-fuel cycle states to forego participation in the nuclear fuel cycle?
- Is the U.S. willing to take back used nuclear fuel?

Incentives would be required with GNEP, such as loan guarantees for all fast fuel cycle facilities and fast power plants to reduce the cost of capital to the equivalent of a long-term corporate bond, taxing actinide creation at thermal plants, and transferring funds to support actinide destruction.

In 2005, prices of uranium enrichment services were high and profitable, but if the price of enrichment falls to $75 per Separative Work Unit (SWU) by 2015, there will be little incentive to invest in new capacity. Some market intervention might be necessary to assure that sufficient investment is made to meet future demand.

Dr. Rothwell concluded that fast reactors could be competitive with subsidized costs of capital and/or transfers between light water reactors and fast reactors. Current policy does not address problems in the enrichment industry, leading to uncertainty and the proliferation of commercial enrichment technologies.

Non-proliferation Aspects of Expanded Nuclear Energy

Hon. Larry W. Brown – Board Member, Defense Nuclear Facilities Safety Board

Mr. Brown began by stating that the sharing of beneficial uses of nuclear technology is essential to building the mutual trust necessary for fulfillment of the Nuclear non-Proliferation Treaty (NPT) objectives.

Those countries that gave up their right to nuclear weapons in the NPT's grand bargain explicitly stated their expectation to benefit from the work done by weapons states on peaceful applications of nuclear technology in Articles IV and V. In his view, this aspect of the NPT was devalued over time in United States policy.

To illustrate these historical trends in U.S. nuclear energy policy, Mr. Brown showed four video excerpts of U.S. presidential speeches. He began with President Truman's 1945 "The Dawn of Nuclear Policy" speech and followed it with a segment of President Eisenhower's 1953 "Atoms for Peace" speech.

What followed was a quarter century of activities that embraced the concept of Atoms for Peace. The signature accomplishments were the establishment of the United Nation's IAEA and the signing of the NPT. At the end of that period, the United States reliability as the primary western nuclear fuel provider was unquestioned, and western cooperation in nuclear technologies provided a sense of public trust in western nuclear standards. By 1978, the United States was producing more electricity from nuclear power than from all sources that had been in production in 1953.

In the second quarter century (1978-2003), U.S. nuclear policy took a radical turn away from partnered development and towards a policy of restraining the spread of sensitive nuclear technologies. To illustrate this turn in U.S. policy, Mr. Brown played an excerpt of President Carter's opening remarks at the International Nuclear Fuel Cycle Evaluation of 1977.

Photo by Howard Baker Center/Nissa Dahlin-Brown

This new policy became U.S. law in the Nuclear Non-Proliferation Act (NNPA). Although the NNPA included both partnership initiatives and technology restraints, few partnership initiatives survived while restraints flourished. U.S "peaceful" nuclear activities slipped into the doldrums while the world continued to develop nuclear capacity. One result is that a stockpile of commercial separated plutonium at western plants currently exceeds 200 metric tons and continues to increase.

Mr. Brown's last video clip was an excerpt of President Bush's 2004 speech to the National Defense University on non-proliferation. This speech and the subsequent announcement of the Global Nuclear Energy Partnership (GNEP) suggest that the third quarter-century of the nuclear age has begun with a U.S. policy adjustment back towards international partnership.

Mr. Brown then posited that partnership will be the key to future successful international non-proliferation efforts and concluded with this statement taken from a study produced in 1946 for President Truman: "the quest for knowledge, this thirst to know (that cannot be 'policed' out of existence) can be used affirmatively in the design and building of an effective system of safeguards."

Daniel B. Poneman – Principal, The Scowcroft Group; Senior Fellow, The Forum for International Policy

Mr. Poneman began by stating that the fuel cycle and the risk of a "plutonium economy" are the key proliferation issues associated with the global expansion of nuclear power. According to Mr. Poneman, the debate on non-proliferation has changed over the past thirty years because there are fewer countries to worry about. Many of those countries that the United States used to be concerned about are now strong

allies. Most significantly, our understanding of the key issues is now deeper and more widespread. Proliferation threats are bad for business, and anyone investing in the future of nuclear energy has a stake in proliferation and investing in non-proliferation.

Mr. Poneman continued by saying that guidelines for nuclear energy will be discriminatory. Governments made nuclear decisions based on self-interest to make sure their future is more stable and more sound in that context. We must 1) continue to rely on global norms; 2) establish a baseline for reference; and 3) ensure a strong degree of adherence to that baseline.

Mr. Poneman recommended beginning with a new consensus that limits the number of countries enriching uranium. In parallel, we should create a stable, predictable, attractive source of fuel services made available to those countries that do not now possess national fuel cycle capacities. The bottom line is that countries need to feel they are acting in their own self-interest, not because an outside power is dictating to them.

Building International Cooperation in Nuclear Energy

Ambassador Robert Joseph – Former Under Secretary of State for Arms Control and International Security; Former Special Assistant to the President for Proliferation Strategy, Counterproliferation, and Homeland Defense

Amb. Joseph listed three principal challenges to the United States in the context of nuclear proliferation: 1) nuclear terrorism; 2) proliferation threats in Iran and North Korea; and 3) preventing a future cascade of proliferation as nuclear energy expands globally.

Photo by Howard Baker Center / Nissa Dahlin-Brown

Amb. Joseph stressed the importance of building international partnerships in meeting these challenges. He pointed to successes such as the G-8 Global Partnership Against the Spread of Weapons and Materials of Mass Destruction, the Proliferation Security Initiative, UNSCR 1540, the Global Initiative to Combat Nuclear Terrorism, and the recently announced U.S.-Russia initiative on nuclear energy and non-proliferation.

He addressed the motives and lessons learned from the Libya experience and held out Libya as an example for others to follow.

While the strategic goals of the United States and Russia differ in some important areas, such as on Iran and missile defense, there are fundamental intersections of common interests, especially concerning nuclear terrorism and nuclear energy. We should work together on these common interests.

In shaping the future of nuclear energy, Amb. Joseph stressed the need for strong non-proliferation measures, especially stopping the spread of enrichment and reprocessing technologies. He concluded that nuclear energy would expand but that this expansion can be managed in a more proliferation-resistant manner, especially through creative means to assure states that fuel will be available to them in the future. He emphasized the need to think strategically to shape the future in a very complex and potentially dangerous environment.

Speaker Presentations – October 4, 2007

Opening Remarks

Hon. Bob Corker – U.S. Senator, R-TN

Senator Corker praised the role Tennessee is playing in the nuclear industry, pointing out that the state has a great heritage in the nuclear arena. Energy will be the greatest mid to long-term issue for the United States. Therefore on the political and business levels, issues of spent nuclear fuel storage, loan guarantees, and permitting for nuclear facilities should be addressed.

Sen. Bob Corker makes remarks as Sen. Baker and Rep. Wamp listen.
Photo by Howard Baker Center / Nissa Dahlin-Brown

Hon. Zach P. Wamp – U.S. Representative, R-TN

Representative Wamp emphasized that we cannot pick winners and losers when it comes to sources of energy. To remain competitive, nothing can be left off the table. The United States must lead through innovation, not regulation, in providing energy solutions to the world. Not only will solving the problems of the world benefit the United States' economy, but there is also nothing to fear in the revival and resurgence of nuclear energy. He stated, "We are no longer caught in the Three Mile Island time-warp." The greatest hurdle to future use of nuclear fission for energy, according to Representative Wamp, is the issue of long-term storage. The single, fastest way to reduce the carbon footprint of America's energy use is with the revival of the U.S. nuclear industry. Representative Wamp pointed to France as a model for the use of nuclear energy and recycling nuclear fuel.

The Economics and Financing of New Nuclear Power Plants: A Financial Community Perspective

Mr. James K. Asselstine – Former Managing Director, Lehman Brothers, Inc.

Mr. Asselstine began by presenting investor perceptions of existing nuclear power plants in the United States, claiming there is an increasingly positive view of nuclear assets. Contributing factors include the following: 1) stranded cost recovery has been resolved favorably; 2) operating performance is strong; 3) the cost structure is low compared to other alternatives; 4) a stable and supportive regulatory environment; and 5) benefits of plant updates and license extension. Some residual investor concerns include the risk of extended plant shutdowns from operating events, material condition issues as plants age, and security threats.

Regarding proposed new plants, Mr. Asselstine said, investors are concerned about their experiences with existing plants, the complexity of construction and the large initial investment associated with it, technology risks, and the potential for new regulatory requirements and licensing or litigation delays. Some of the key issues that must be addressed in Mr. Asselstine's view include cost competitiveness of initial units, first-of-a-kind engineering (FOAKE) costs, decommissioning costs and regulatory uncertainties. These can all be addressed through a combination of contractual provisions and government-provided financial incentives for the initial plants.

Photo by Howard Baker Center / Nissa Dahlin-Brown

The likely financing models proposed by Mr. Asselstine are a regulated utility project, an unregulated merchant generating company project, and a non-recourse project finance structure. He also discussed the financial incentives in the 2005 Energy Policy Act including stand-by support or delay insurance and production tax credits.

Mr. Asselstine said that new nuclear units can be financed using any of the three financing models with effective implementation of the EPACT financial incentives, successful validation of the NRC's design certification, Early Site Permitting (ESP), new Combined Operating and Licensing Application processes, workable ITAAC requirements, appropriate risk-sharing in construction contracts, continued successful operating performance of the existing plants, and continued progress toward a long-term spent fuel storage solution.

In conclusion, Mr. Asselstine warned that we should be cautiously optimistic of where we are now. Even with the improved modern nuclear reactor licensing and permitting process, this is a step-by-step building block approach. The bottom line, according to Mr. Asselstine, is the execution of regulatory obligations on the part of industry, government, and the NRC.

The Nuclear Fuel Cycle in America – Present and Future

Hon. Dennis Spurgeon – Assistant Secretary for Nuclear Energy, U.S. Department of Energy

Sec. Spurgeon began by stating emphatically that, as Assistant Secretary of Energy, his goal is to ensure greater use of nuclear power for America's and the world's energy needs. He explained the basic principles of the U.S.-initiated Global Nuclear Energy Partnership (GNEP) and U.S. domestic programs supporting these goals, including Nuclear Power 2010. He explained the successes to date and then focused on the hurdles he foresees in the future.

Sec. Spurgeon asserted that to understand where we are going, we need to know where we have been. Forty years ago, nuclear policies and the way forward were quite clear; there was no question about closing the fuel cycle, West Valley was almost complete, there were enrichment activities at three operating gaseous diffusion plants, and there was a secret effort to develop centrifuge enrichment technology. Most importantly, there was oversight by the Joint Committee on Atomic Energy, which provided certainty and continuity in projects. Because of this history, there is a precedent for growth allowing us to know it can be done.

Mr. Spurgeon referred to "the perfect storm" in describing what happened subsequently. The first clouds appeared with the 1973 oil embargo which increased the price of energy, made demand fall, and led to recession, which made demand fall even more. The United States cut back by canceling nuclear plants because costs were very high and nuclear was non-competitive with other sources of electricity. Nuclear energy became a source of last resort, taking a downward spiral, which was accelerated by the Three Mile Island accident of 1979.

Photo by Howard Baker Center / Nissa Dahlin-Brown

In the 1980s, nuclear energy was considered too expensive, and the centrifuge program was cancelled. Thereafter, the United States no longer had the leading edge. Today, Mr. Spurgeon emphasized the fact that we need new reactor orders and incentives to get the ball rolling in order to garner a sustainable nuclear renaissance. Nuclear makes up almost 70% of net non-carbon-emitting sources of electricity

In his concluding remarks, Mr. Spurgeon described GNEP as an international structure with the objective of advancing nuclear energy without the risk of added proliferation. In terms of technology, he explained that we are trying to achieve separation and transmutation, which can greatly reduce the long-term radiotoxicity of waste material.

Panel Discussion: New Nuclear Plant Development Decision Making – Perspectives from the Boardroom

Admiral Skip Bowman – President and CEO, Nuclear Energy Institute

As panel facilitator, Admiral Bowman counseled that nuclear power be put in context when compared to other energy sources. Time frame and cost influence how competitive nuclear might be in the future.

Mr. J. Barnie Beasley – President and CEO, Southern Nuclear Company

Mr. Beasley explained how the southeast part of the United States is subject to load, demand, and population growth. In fact, by 2030, 43% of U.S. population will live in the South. By 2025, Southern Company will add 1.2 million new customers. Though he is interested in energy conservation, Mr. Beasley rationalized that with this kind of growth, base load generation is a top priority. Nuclear energy, in his view, is a viable option based on the fundamentals of performance of the nuclear fleet.

Mr. Michael J. Wallace – Executive Vice President, Constellation Energy; President and CEO, Constellation Energy Nuclear Group; Chairman, UniStar Nuclear Energy

Mr. Wallace stated that Constellation Energy's Board of Directors decided that new nuclear should be a new thrust for the company. Even though the technology and sites have been selected and a joint venture enterprise with EDF is underway, the decision to build has not yet been made. Why is there such a challenge? Mr. Wallace, similarly to several other speakers, pointed to the Three Mile Island accident, high costs, and financial caution used by utilities. Other issues historically plaguing nuclear plant operations include extended outages, early shutdowns, lack of a U.S. nuclear infrastructure, an untested licensing process, and global competition for resources.

To make a "go or no-go" nuclear decision by the end of 2008, Mr. Wallace encouraged reduction of uncertainty about technology, tax credits, loan guarantees, the regulatory process, costs, and construction.

Mr. Bill McCollum – Chief Operating Officer, Tennessee Valley Authority

Mr. McCollum explained that one of the fundamentals that TVA looks for in approving projects is the ability to manage key project risks. Because there is no certainty in any business venture, TVA is looking for a manageable structure – not a guarantee – to deal with construction and financial risks appropriately.

Because the industry has not built large nuclear projects in the recent past, we may not realize how challenging these projects are or the level of discipline in project management and engineering which is required. Concerning the financial risk and how to manage it, he stressed the need for clear understanding (accounting for uncertainties like interest rates) and adequate resources for project completion.

Ms. Marilyn Kray – Vice President of Project Development, Exelon Nuclear; President, NuStart Energy Development, LLC

Exelon's Board of Directors decided to preserve nuclear energy as an option with the understanding that two key challenges remain:

1. Regulatory uncertainty must be reduced.
2. Advanced passive reactor system designs must be further developed.

Ms. Kray explained that utilities do not have an appetite for risk and remain guarded in their decision-making processes. Because each announcement represents a significant decision by the Board of Directors, Ms. Kray called for patience as Exelon and other utilities take their first steps in new nuclear power plant development. Utilities' guarded optimism is evident, however, in the number of recent announcements to pursue a Combined Construction and Operating License.

Mr. Tom Flaherty – Senior Vice President, Booz Allen Hamilton

Mr. Flaherty indicated that the scrutiny by Boards of Directors of decisions to build new nuclear plants should be expected to continually increase because these decisions have grown in significance. This expansion of Board involvement reflects the still uncertain outcomes of projects that have many years to run until construction begins. Furthermore, current Boards have little institutional memory (as few directors or managements were involved with the last cycle) and must be better informed than in the past.

He indicated that boards would be focused on two areas with respect to their evaluations of new nuclear plants: comfort and confidence. First, Boards will need to have *comfort* that their managements have thoroughly identified and assessed the risks associated with nuclear development in today's environment, rather than simply extrapolating the risks of the past era. Second, the Boards will need to develop a sense of *confidence* that management can demonstrate an ability to execute the requirements for project success. On this topic, Mr. Flaherty suggested that the models for owner involvement would build from those utilized in the later stages of the last nuclear construction cycle and that management should be prepared to be more, rather than less, involved regardless of the form of the contract arrangements in place.

Panelists – L. to R.: Skip Bowman (at podium), Barnie Beasley, Mike Wallace, Bill McCollum, Marilyn Kray; also on the panel but not pictured was Tom Flaherty.
Photo by Howard Baker Center / Nissa Dahlin-Brown

Remarks

Hon. Dale Klein – Chairman, U.S. Nuclear Regulatory Commission

Photo by Howard Baker Center / Nissa Dahlin-Brown

Chairman Klein opened his remarks by saying that it appeared the "Nuclear Renaissance" had begun in light of the fact that the NRC had recently received the first application in decades to build a new nuclear power plant and that perhaps twenty or more applications were expected within the next year and a half.

While emphasizing that the NRC was well prepared to perform timely reviews of these applications, Chm. Klein pointed out that significant challenges still remain. Given the aging of the nuclear workforce, both government and commercial utilities need to hire and train more nuclear engineers, as well as skilled craft workers such as welders, electricians, and others. Another challenge mentioned by Chm. Klein involved the transition to new technologies, such as the move from analog electronics to digital instrumentation and controls. Over the long term, both the NRC and industry needed to prepare for the development of advanced and innovative reactors and fuel cycle facilities.

He then discussed the Global Nuclear Energy Partnership, or GNEP, launched by President Bush, which he said might represent a "fuel cycle renaissance." Dr. Klein outlined the various regulatory issues that the NRC would need to address as GNEP moved forward. He reiterated a proposal that he put forward at the annual meeting of the International Atomic Energy Agency meeting in Vienna, which outlined a more cooperative and coordinated international approach to developing the necessary regulatory framework for advanced and innovative fuel cycle facilities.

The Chairman concluded by thanking the organizers of the conference and emphasizing the importance of remaining focused on the safety and security of nuclear materials and facilities.

Keynote Address

Hon. Samuel W. Bodman – Secretary of Energy, U.S. Department of Energy

Secretary Bodman discussed the role of nuclear energy in U.S. efforts to make the homeland and the world more secure. He noted that enhancing U.S. energy security has been a priority of President Bush. The Administration has focused on bringing clean, safe, and reliable sources of energy to the market to serve as alternatives to imported fossil fuels. For the foreseeable future, nuclear is the only emissions-free technology available to meet the projected demand growth over the next 25 years.

Photo by Howard Baker Center / Nissa Dahlin-Brown

Secretary Bodman took the opportunity of addressing conference participants to announce a new DOE achievement: "the Department is issuing the Final Rule for Loan Guarantees pursuant to the program established by Title XVII of EPACT - the Energy Policy Act of 2005. Through this Loan Guarantee program, the Department of Energy now has a mechanism to support and promote the early commercial use of innovative technologies in projects that will avoid, reduce or sequester air pollutants or greenhouse gas emissions."

According to Secretary Bodman, DOE's loan guarantees will help mitigate the financial risks inherent in the commercial deployment of innovative technologies.

DOE can guarantee up to 100% of a loan but will not issue guarantees for more than 80% of a project's cost. The capital structure must include a significant amount of equity contributed by the project's sponsors. Applicants will also have to pay the required credit subsidy costs.

The Secretary also announced DOE was inviting 16 companies to submit formal applications for Title XVII loan guarantees and, though these are for non-nuclear projects, it is his hope that Congress will extend the option to advanced nuclear power technologies.

The government has streamlined the application process so that companies need only apply once for both construction and operation of facilities. Conditional agreement templates are in place to help the first six sponsors of new plants qualify for the available risk insurance.

Seventeen companies have signaled plans to build more than 29 units to further nuclear production in the United States. Secretary Bodman emphasized the United States will take a leadership role in the effort to expand the use of nuclear energy around the world. GNEP also constitutes the future of global cooperation in nuclear power.

Secretary Bodman concluded that all issues he mentioned point to a reemergence and expansion of nuclear power, both domestically and internationally. He spoke of the bright future of nuclear energy, rising to meet the challenges of climate change and increasing electricity demand.

Alternative Views – Considering the Critique of Nuclear Power

Dr. Eugene A. Rosa – Edward R. Meyer Professor of Natural Resources and Environmental Policy, Thomas S. Foley Institute for Public Policy and Public Service; Professor of Sociology, Washington State University

Dr. Rosa's presentation, *The Public Climate for Nuclear Power: the Changing of Seasons*, was centered around two empirical questions:

- What are the limiting factors for nuclear energy? Dr. Rosa listed safety issues, the disposal of nuclear waste, and terrorist threats to facilities as the most important limiting factors as did many of the speakers at the conference. He also included low levels of public trust for major institutions like Congress, DOE, and the NRC as a factor.
- How and why has the public acceptance of nuclear energy changed over the past twenty years? Through a number of polls, Dr. Rosa demonstrated the trends in public attitudes toward nuclear issues, especially concerning building new plants, environmental repercussions, and sources of electricity. He described the 1954-1980 period as sunny, the 1980-1995 period as stormy, and the 1995-present period as cloudy, forecasting the future climate to be partly sunny with patchy clouds.

Photo by Howard Baker Center / Nissa Dahlin-Brown

Dr. Rosa presented the results of a variety of national surveys that questioned respondents about different aspects of nuclear power: expectations of the future role of the technology, building more nuclear plants, and citing a nuclear power plant in one's own community. For over two decades since the Three Mile Island accident in 1979 the American public was solidly opposed to building more nuclear power plants by a ratio of over 2:1. But, as of late 2003, public opposition to nuclear energy "as an environmental proposal" declined considerably, and a slight majority favored building more plants.

The very slight majority, just beyond statistical significance, continued to the most recent poll in 2007. In the abstract—views toward nuclear electricity in general and as a future energy source—nuclear energy continues to be viewed favorably as it has for the past several decades. A different picture emerges when citizens are asked whether they are willing to accept a nuclear power plant in their community; consistent majorities oppose a plant near them. Professor Rosa argued that the seeming contradiction in the survey evidence is not a contradiction at all but instead reveals an underlying logic.

Americans are consistently either favorable or opposed to nuclear power on the basis of perceived exposure to nuclear risks.

Dr. Charles D. Ferguson – Fellow for Science and Technology, Council on Foreign Relations

Dr. Ferguson, a well-recognized and well written commentator on nuclear energy, first provided clarification to some recent public commentary characterizing him as "part of the serious opposition to nuclear power." A nuclear engineer and physicist himself, Dr. Ferguson stated on the contrary that he is "…neither opposed to the continued use of nuclear power nor opposed to the expansion of nuclear power

as long as it meets rigorous safety and security standards." In this context, he discussed his recent report *Nuclear Energy: Balancing Benefits and Risks*.

Dr. Ferguson noted that contrary to conventional wisdom, any serious reservation about new nuclear power plants comes from the investment community rather than grassroots opposition. A recent resurgence in interest in new plants in the United States has been coupled with legislation that provides additional incentives for those proposed new plants. Most of these incentives are also available for other low-and no-carbon emission energy sources.

According to Dr. Ferguson, nuclear energy is embedded in a globalized economy; for its recent plant application, NRG Energy receives support from Tokyo Electric Power Corporation. Furthermore, Constellation Energy and EDF have teamed up to build up to four reactors. Perhaps global investment will bring the American nuclear industry back to life.

Nevertheless, he questioned whether this resurgence in interest represents a transient phenomenon especially if incentives have an adverse effect on the nuclear industry. Echoing a recurrent theme at the conference, Dr. Ferguson also emphasized the importance of not picking winners and losers, but rather decide as a society whether to factor in external costs in the price of an energy source.

Dr. Ferguson called for the successful management of nuclear energy's risks, namely safety, security, waste disposal, and proliferation.

In his conclusion, Dr. Ferguson addressed the "mental fog" clouding the nuclear energy debate: generally people do not care where their energy comes from, there will be continued growing global demand for energy, sovereign nations do not like other nations dictating their policies to them, and the nuclear renaissance may not materialize in the form of significantly greater net use of nuclear power. What matters most in Dr. Ferguson's view, is the need for innovative approaches that would create a paradigm shift from those countries who deny to those who provide energy sources that are clean, safe, secure, and reliable considering environmental, proliferation, and economic factors.

Nuclear Power Plant Security: A Discussion of Realities, Concerns and Conclusions

Mr. Jerry Paul – Distinguished Fellow on Energy Policy, Howard H. Baker Center for Public Policy, University of Tennessee

Mr. Paul pointed out that discussions about nuclear energy often are very passionate, especially regarding specific topics such as the environment, safety, and economics. However, he singled out "nuclear security" as the one issue where advocates both pro and con should make an exception in their zealous arguments, advocacy, and exploitation of anecdotal facts to make points.

The importance of security is tied to the attractiveness of the target, threat modes, and mechanisms and infrastructure needed. Though a nuclear power plant is publicly perceived to be a highly attractive target for a terrorist attack, Mr. Paul argued that it is actually a lower level target in part because the probability of successful attack is so low. He pointed out that deterrence is an important factor. When the whole host of potential targets worldwide is assessed from the perspective of attacking forces seeking terror as their objective, there are indeed attractive targets, but nuclear power plants probably are not high on the list. He also clarified that despite some confusion in the public dialogue, nuclear power plants cannot be made into a nuclear explosive device.

Mr. Paul discussed the layered defenses at nuclear power plants and noted the relative threat modes associated with potential access, damage to key systems, and the probabilities of radiation being released. He discussed the potential for attacks by aircraft, and highlighted the results of comprehensive testing, analysis, and simulation showing that such attacks present a very low probability of radiation release.

Photo by Howard Baker Center / Nissa Dahlin-Brown

Mr. Paul discussed nuclear security associated with the proposed new fleet of nuclear power plants. He pointed out that these will be in a better position in many ways to meet a Design Basis Threat security posture because of the benefits of being able to build advanced security systems, infrastructure, and experience into these new designs.

He further cautioned not to confuse security and non-proliferation. Mr. Paul pointed out that members of the media, politicians, and even some experts often confuse the concept of security at a facility with the concept of nuclear technology being proliferated to entities who would employ the technology for military purposes.

The American Nuclear Renaissance: What's at Stake for Jobs, the Environment, and Economic Growth

Hon. J. Bennett Johnston – Former U.S. Senator, D-LA

Senator Johnston began with his thoughts on what he sees as the fundamental change that has occurred in energy markets. He reminded participants of Energy Information Agency's (EIA) projections: by 2030, electricity demand will double and oil consumption will be up 60%. An expanding global population equals an expanding use of energy. He added to the energy equation the need to consider the problem of global warming, an issue which was not around at the time of the signing of the NPT. Still, even with these concerns, he claimed that it is not necessarily inevitable that we will see an expansion of nuclear energy in the United States because of capital, which nuclear power plants require in large amounts.

The Senator's conclusion called for the U.S. to seize leadership to stop the CO_2 catastrophe. Nuclear energy must lead the way.

Mr. Adam Sacks – Oxford Economics

Mr. Sacks' presentation touched upon the economic benefits of a new nuclear energy investment program including jobs, financial profits, oil import reduction, and lowering carbon emissions. He characterized benefits from four "Channels of Effect" including: 1) Direct Effects; 2) Indirect Effects; 3) Induced Effects; and 4) Effects of new nuclear capacity on U.S. fuel use and on U.S. carbon emissions.

He concluded that the peak benefits of expanded nuclear technology coupled with a program of investment in nuclear fuel recycling could result in 400,000 new jobs, $30 billion of value added per year, up to $41 billion reduction in oil imports per year, up to 390 tonnes of CO2 emissions reduction per year, and approximately 50,000 high-tech, high-value-added manufacturing jobs.

He argued that such investment would position the United States as a leader in the global nuclear energy industry for decades to come and that without investment, nuclear generation capacity will decrease to zero by 2050.

If the nuclear investment program does not occur, the likely alternative supplier would be coal, which would probably imply substantial investment in coal-fired generation capacity and associated emissions.

Mr. Sacks' main conclusion described the wide range of benefits that an investment in U.S. nuclear energy capacity would offer: substantial economic impacts through the creation of construction and high tech manufacturing jobs, ongoing economic benefits through the operations of reactors and recycling plants, trade balance and independence benefits though reduced oil imports, and environmental benefits through reduced CO_2.

Panel Discussion: The Evolving Nuclear Power Supply Chain

Mr. Steve Tritch – President and CEO, Westinghouse - facilitator

In Mr. Tritch's opinion, if investment for nuclear energy is present, an expansion will happen. When orders are placed, investment ensues, and suppliers also will invest to meet the demand. The companies that act soon on the U.S. market will receive the supply they need to prosper. If the first few are successful, many more will want to build reactors and delays could occur.

Concerning U.S. versus non-U.S. manufacturers, Mr. Tritch explained how the production of some components may not come back to the United States because of cost issues. It is inevitable that in a global market, some components will be produced internationally.

Mr. Richard E. Reimels – President, The Babcock & Wilcox Companies Nuclear Power Generator Group (NPG)

Mr. Reimels agreed with Mr. Tritch that once orders for new reactors are placed, manufacturing will follow. In his view, the United States can be competitive even in light of the "China effect" and other marketplaces in which we may be competing.

In his presentation, Mr. Reimels said energy demand is rising, there is an increasing recognition of the role of nuclear power in the energy mix, global energy requirements are growing, and the ability of suppliers to respond to the nuclear industry's requirements will be a challenge.

Some of the key issues include resource planning, supply chain capacity, risk management, the standardization of practices to minimize costs and time, and competition from other industries for critical resources and material. The primary challenges are delivering high-quality products in a safe manner, on time and on budget, and suppliers being required to balance risk and opportunity.

The general critical success factors, according to Mr. Reimels, are clarity in direction, investment with market certainty, most of the supply base providing products and services to more than one market, and appropriate timing. More specifically, nuclear design capabilities must be effective, fabrication must be available, a qualified supplier base must be in place, raw materials must be accessible, personnel must be qualified, and worldwide suppliers must be integrated.

Mr. Reimels concluded there are great opportunities and challenges for industry. Suppliers will play a critical role in the overall success of a nuclear renaissance, and industry must demonstrate advanced planning.

Mr. Steve Creamer – President and CEO, EnergySolutions
Mr. Creamer pointed to the presidential election of November 2008 and to the challenges facing the nuclear industry. In order to meet the requirements for nuclear energy expansion, creating support will be vital, both within the Washington, D.C. beltway as well as outside.

Mr. Thomas A. Christopher – President and CEO, AREVA NP, Inc.
Mr. Christopher pointed to the essential issues of licensing and design, but he placed special emphasis on costs. A nuclear renaissance is possible, in his view, but establishing the costs is key. These will be directly related to the number of orders materializing. He explained the value of the new Design Certification process, pointing out that with the new fleet of "Generation III" designs, there will be greater opportunity for vendors to provide a consistent engineering interface where U.S. industrial manufacturers can supply equipment that receives more efficient certification.

All in all, according to Mr. Christopher, we are facing a different set of challenges than thirty years ago. He is optimistic but stressed that it will be important to evaluate the issues accurately in the changing climate facing us today and in the future.

Mr. Steven Hucik – General Manager, Nuclear Plant Projects, General Electric-Hitachi Nuclear Energy
Mr. Hucik explored how to best meet the latest requirements: by spending time with vendors, getting inspectors back up to speed, and qualifying equipment. Changes need to be made in the philosophy and scope of some the businesses involved. It is an overall exciting and challenging time, especially because many people are looking to become reengaged in new units.

Dr. Farzad Rahnema – Professor and Chair of the Nuclear and Radiological Engineering and Medical Physics Program, Georgia Institute of Technology
The focus of Dr. Rahnema's remarks was on promoting opportunities for nuclear engineering graduates. Currently, the infrastructure is not in place because academic programs were cut in the 1990s. Only 24% of undergraduate nuclear engineering graduates end up working in the nuclear field as do 40% of those with graduate degrees.

Mr. John K. Welch – President and CEO, United States Enrichment Corporation (USEC) Inc.
In Mr. Welch's view, the renaissance of nuclear power has already begun. USEC is deploying the American Centrifuge program to meet fuel supply needs, and it has accomplished significant progress to date. The fuel supply chain must be ready to support the growth of nuclear power. Utilities need the assurance of a reliable, secure, and competitive fuel supply. The United States needs a robust, domestic nuclear industrial base to compete in the global market. An existing gaseous diffusion plant remains a key industry component in the near term.

The benefits of USEC's American Centrifuge are its low-cost productivity, higher efficiency, modular expansion, and security of supply.

Concluding Remarks

Mr. Jerry Paul – Distinguished Fellow on Energy Policy, Howard H. Baker Center for Public Policy, University of Tennessee

Mr. Paul announced at the closing of the conference that a second application for reactor construction had just been received. He pointed to this and other signs of a rejuvenating industry.

Mr. Paul thanked the audience and speakers for the unprecedented level of participation contributing to a unique and helpful dialogue on one of the most important energy-related issues of our time. He extended appreciation for the Woodrow Wilson Center's partnership with the Howard Baker Center for Public Policy and encouraged the audience to watch for upcoming events as the Baker Center's Energy Program continues to stimulate debate on key energy issues.

Clockwise from above: Attendee Al Trivelpiece asks a question; Alain Bugat next to Dr. Kondo makes a remark; Sen. Howard Baker and Alan Lowe listen during the conference.
Photos courtesy of Woodrow Wilson Center / Heidi Fancher

Speaker Biographies

Sen. Lamar Alexander is the only Tennessean ever to be popularly elected both governor and United States Senator. He has been U.S. Education Secretary, president of the University of Tennessee, and the Goodman professor at Harvard's School of Government. He was chairman of President Reagan's Commission on Americans Outdoors and the National Governor's Association. He received a B.A. degree from Vanderbilt University and a J.D. from New York University Law School.

James K. Asselstine recently retired from his position as a Managing Director with Lehman Brothers, Inc. During his more than 18 years with Lehman Brothers, he was a senior fixed income research analyst covering the electric power industry. Mr. Asselstine was also a member of the firm's Investment Banking Division Commitment and Bridge Loan Committees and was the global head of high grade credit research for six years. He served as a Commissioner on the U.S. Nuclear Regulatory Commission from 1982 to 1987. From 1978 to 1982, he served as Associate Counsel for the U.S. Senate Committee on Environment and Public Works. While on the staff of the committee, he also served as a Co-Director of the committee's investigation of the Three Mile Island nuclear power plant accident. Mr. Asselstine holds a B.A. degree in Political Science from Virginia Polytechnic Institute and a J.D. degree from the University of Virginia.

Barnie Beasley is Chairman, President and Chief Executive Officer of Southern Nuclear Operating Company. Beasley first joined Georgia Power Company in 1969 as a co-op student. He served in various electrical distribution roles before transferring to Plant Vogtle in 1980, where he moved through successive management roles in Construction and Operations. He has held numerous executive offices before acquiring his current position of President and CEO in 2004 and Chairman in 2005. Mr. Beasley graduated from the University of Georgia with a B.S. degree in Engineering. Beasley serves on the Board of Directors and several committees for the Nuclear Energy Institute (NEI) as well as organizations at the state and local levels.

Rep. Marsha Blackburn was sent to the U.S. House of Representatives at the start of the 108th Congress where she was one of only a few newly-elected congressmen selected to serve as an assistant whip on the majority whip team and the first female in Tennessee elected in her own right to the US House. Blackburn was elected State Senator in 1998, becoming the first woman to represent Tennessee's 23rd Senate District. She has been named the Communications Chairman for the Republican Study Committee. Blackburn was also named by Rep. Tom Cole (R-OK) as the Communications Chairman for the National Republican Congressional Committee, which recruits and supports Republican candidates for the United States Congress. A graduate of Mississippi State University and a small business owner, Blackburn has been actively involved in Tennessee grassroots politics and civic organizations for more than 25 years.

Sec. Samuel Wright Bodman was sworn in as the 11th Secretary of Energy in 2005. Previously, Secretary Bodman served as Deputy Secretary of the Treasury beginning in February 2004. He also served the Bush Administration as the Deputy Secretary of the Department of Commerce beginning in 2001. He graduated with a B.S. in chemical engineering from Cornell University and completed his ScD at Massachusetts Institute of Technology. Over the years, he has held senior executive offices for many publicly owned corporations. Secretary Bodman has also been active in public service as a former Director of MIT's School of Engineering Practice and a former member of the M.I.T. Commission on Education.

Admiral Frank L. "Skip" Bowman is President and Chief Executive Officer of the Nuclear Energy Institute. Prior to joining NEI in 2005, Skip served for more than 38 years in the U.S. Navy, rising to the rank of Admiral. He served as Director of the Naval Nuclear Propulsion Program and was

concurrently Deputy Administrator-Naval Reactors in the National Nuclear Security Administration at the U.S. Department of Energy. Skip also served as the Chief of Naval Personnel. Skip is a 1966 graduate of Duke University; he completed a dual master's program in nuclear engineering and naval architecture/marine engineering at MIT in 1973. Skip has been awarded the honorary degree of Doctor of Humane Letters from Duke University. In 2006, he was made a Knight Commander of the Most Excellent Order of the British Empire.

Larry W. Brown was confirmed by the U.S. Senate in September 2006 to be a member of the Defense Nuclear Facilities Safety Board. After joining the Administration in 2001 at the U.S. Department of Energy, Mr. Brown worked as the Senior Policy Advisor for nuclear, spent fuel, and nonproliferation/security issues. His last position at the Department of Energy before joining the Board was the Deputy Assistant Secretary for Corporate Business Operations in the Office of Nuclear Energy. Prior to his 2001 appointment at DOE, Mr. Brown served on active duty in the United States Navy. He began military service as a Seaman Recruit and retired as United States Navy Captain after serving from 1963 to 1996 onboard ten ships, including nuclear submarines, destroyers, frigates, supply ships, and a nuclear aircraft carrier. Early in his career he qualified in nuclear plant operations on three naval nuclear reactors.

Alain Bugat was appointed Chairman of the Atomic Energy Commission (CEA) by the French government in 2003. A graduate of Ecole Polytechnique, Bugat joined CEA in 1973 where he served in the military applications division. After leaving the CEA for a couple of years assignment in the Ministry of Industry, he returned as Deputy Director in charge of nuclear testing. From 1989 to 1992 he was first Deputy then General Director of CISI Engineering , a subsidiary of CISI, an information technology company within the CEA industry group. In 1992 he was once again at CEA as Director of the Advanced Technologies Division. Since 1999 Alain Bugat has been president and CEO of Technicatome, a company dealing primarily with the nuclear propulsion of French submarines and aircraft carriers.

Thomas A. Christopher joined AREVA NP Inc. (formerly Framatome ANP, Inc.) as President and Chief Executive Officer in April 2000. Prior to joining AREVA, he was most recently the Vice President and General Manager of the Siemens Westinghouse Power Corporation's Energy Services Divisions. Prior to that, he was Vice President and General Manager of the Westinghouse Power Generation Business Unit's Energy Division. He holds a Bachelor of Science degree in Mechanical Engineering from the U. S. Naval Academy and a Master of Science degree in Engineering Mechanics from Georgia Tech. He graduated from the Naval Nuclear Program and was a licensed engineering officer of Operating Nuclear Submarines. In 1980, he earned a Master of Business degree from the University of Pittsburgh.

Sen. Bob Corker graduated from the University of Tennessee with a degree in Industrial Management, and after working four years as a construction superintendent, he started his own construction company. In 1994, he was appointed Tennessee Commissioner of Finance and Administration, where he served for two years. In 2001, he was elected mayor of Chattanooga. On November 7, 2006, he was elected to serve the people of Tennessee in the United States Senate. He is a member of the Senate Committees on Foreign Relations; Armed Services; Energy and Natural Resources; Small Business and Entrepreneurship; and the Special Committee on Aging.

Steve Creamer began his career in engineering, environmental regulation and transportation. He founded Creamer and Noble Engineers, a consulting engineering firm in 1976 and in 1990, as CEO expanded ECDC Environmental. He later sold a majority stake in the company to USPCI, a Union Pacific hazardous waste company, and to Laidlaw Environmental and remained as the operating partner with the two companies. In 2002, Mr. Creamer became the CEO of ISG which was later acquired by Headwaters Inc. In 2005 Mr. Creamer, as part of a consortium of investors, purchased Envirocare of Utah and was named

CEO. Through subsequent acquisitions Mr. Creamer has overseen the creation of EnergySolutions. Today EnergySolutions operates in 40 states, the United Kingdom and Canada, managing more than 5,000 employees. Mr. Creamer holds a B.S. degree in Civil & Environmental Engineering from Utah State University. He is a Utah native and lives in Salt Lake City with his wife.

Dr. Charles D. Ferguson is a fellow for science and technology at the Council on Foreign Relations. He is also an adjunct assistant professor in the School of Foreign Service at Georgetown University and an adjunct lecturer at the Johns Hopkins University. Before coming to the Council, Dr. Ferguson was scientist-in-residence at the Center for Nonproliferation Studies of the Monterey Institute of International Studies. He is also the lead author of the award-winning report *Commercial Radioactive Sources: Surveying the Security Risks*. Dr. Ferguson has worked on nuclear safety issues in the Nonproliferation Bureau at the U.S. Department of State. After graduating with distinction from the U.S. Naval Academy, he served as a nuclear engineering officer on a ballistic-missile submarine. He holds a PhD in physics from Boston University. In April 2007, the Council published the Special Report "Nuclear Energy: Balancing Benefits and Risks," written by Dr. Ferguson.

Dr. Steve Fetter is dean of the School of Public Policy, where he has been a professor since 1988. His research interests include arms control and nonproliferation, nuclear energy and releases of radiation, and climate change and carbon-free energy supply. He has been an advisor to many government agencies, NGOs, and scientific organizations, and has held visiting positions at Stanford, Harvard, and MIT. He holds a Ph.D. in energy and resources from the University of California, Berkeley, and an S.B. in physics from MIT.

Tom Flaherty is a Senior Vice President with Booz Allen Hamilton and leads its utility consulting business in the United States. Tom has over 35 years of consulting experience and has worked on more than 20 new plant construction efforts. Tom has directed engagements related to economic viability, project management, project controls, design management and construction management of numerous energy facilities and has filed testimony in jurisdictions regarding nuclear performance issues. Tom has also been involved in numerous power and gas mergers in the United States and a number of cross-border transactions involving companies in the United Kingdom, Canada, Australia, and New Zealand. Prior to joining Booz Allen, Tom led the Deloitte Consulting strategy and operations practice area where he focused on mergers and acquisitions in the energy arena. Tom holds a Bachelor of Business Administration degree (BBA) in Accounting from the University of Oklahoma

Hon. Lee Hamilton is president and director of the Woodrow Wilson International Center for Scholars. Prior to becoming director of the Woodrow Wilson Center in 1999, he served for 34 years in Congress representing Indiana's Ninth District. Since leaving the House, Mr. Hamilton has served as a commissioner on the influential United States Commission on National Security in the 21st Century (the Hart-Rudman Commission) and was co-chair with former Senator Howard Baker of the Baker-Hamilton Commission to Investigate Certain Security Issues at Los Alamos. He is currently a member of the President's Homeland Security Advisory Council. Mr. Hamilton is a graduate of DePauw University and Indiana University law school as well as the recipient of numerous honorary degrees and national awards for public service. Before his election to Congress, he practiced law in Chicago and Columbus, Indiana.

Steven Hucik is the General Manager of Nuclear Plant Projects for GE Nuclear Energy. In this position, he leads GE Nuclear Energy's efforts in new plant projects in the advanced light water reactor field. He holds a BS degree in Mechanical Engineering from Washington State University and an MS degree in Mechanical Engineering from the University of California at Berkeley. He joined GE in 1973 on the Technical Leadership Program and has held increasingly responsible positions. Steve has held various positions in development, containment design and analysis, safety analysis and project management. He has

been a leader in GE's Advanced BWR design and development for over 25 years and was previously the Project Manager for the first ABWR Project at TEPCO's Kashiwazaki-Kariwa Japan site from 1986 through 1992 and then Project Manager for Taiwan Power Company's ABWR Project at Lungmen. He was named General Manager of Nuclear Plant Projects in 1995 and has responsibility for all major nuclear plant projects in GE, including the ABWR contract for the design and construction of two ABWRs for Taiwan Power Company at the Lungmen site. Mr. Hucik is responsible for all GE's Nuclear Projects and advanced design work including the ESBWR design and licensing for future global power plant product offerings, and the responsibility for the DOE NP 2010 Program. Steve was a member of NEI's Ad Hoc Committee on The Strategic Plan for New Power Plants and participated in the development of the industry's report on the Nuclear Future Plan. He is currently a member of NEI's Executive Task Force on New Nuclear Power Plant Construction for the U.S. and is also actively involved in development Boards in his community. He has attained certification as a Green Belt in GE's Six Sigma Customer Quality initiative.

Sen. J. Bennett Johnston's public political career spanned 32 years including eight years in the Louisiana Legislature and 24 years in the United States Senate. As a member of the Senate Committee on Energy and Natural Resources from its creation and its Chairman and Ranking Member for much of that time, he was either directly or indirectly responsible for all energy legislation considered by the Congress between 1973 and 1996. Senator Johnston wrote the Energy Policy Act of 1992 which included the nuclear licensing provisions and was author of the Nuclear Waste Policy Act of 1982 and its 1987 amendments. He was a senior member of the Senate Appropriations Committee and served as Chairman and Ranking Member of the Subcommittee on Energy & Water Development. He also served on the Senate Budget Committee since its inception.

Ambassador Robert G. Joseph is Special Assistant to the President and Senior Director for Proliferation Strategies, Counterproliferation, and Homeland Defense for the U.S. National Security Council (NSC). Prior to joining the NSC staff, Dr. Joseph served as a Professor of National Security Studies and Director of the Center for Counterproliferation Research at the National Defense University. In the previous Bush administration, he held the positions of U.S. Commissioner to the Standing Consultative Commission on the Anti-Ballistic Missile (ABM) Treaty and Ambassador to the U.S.-Russian Consultative Commission on Nuclear Testing. In the Reagan administration, he held several positions within the Office of the Secretary of Defense, including Principal Deputy Assistant Secretary of Defense for International Security Policy and Deputy Assistant Secretary of Defense for Nuclear Forces and Arms Control Policy.

Dr. Dale Klein became Chairman of the Nuclear Regulatory Commission in July 2006, after his nomination by President George W. Bush and Senate confirmation. Before his appointment, he was the Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs. Previously, Dr. Klein served as the Vice-Chancellor for Special Engineering Programs at the University of Texas System and as a professor in the Department of Mechanical Engineering (Nuclear Program). He was also Director of the Nuclear Engineering Teaching Laboratory, Deputy Director of the Center for Energy Studies, and Associate Dean for Research and Administration in the College of Engineering. In addition to many honors and awards, Dr. Klein holds a bachelor's and master's degree in mechanical engineering and a doctorate in nuclear engineering, all from the University of Missouri-Columbia. He has published more than 100 technical papers and reports and has co-edited one book.

Dr. Shunsuke Kondo has been the Chairman of the Atomic Energy Commission since January 2004. He was born on July 26, 1942. He obtained a bachelor's degree from the Department of Nuclear Engineering, School of Engineering, The University of Tokyo in 1965 and became a Doctor of Engineering in Nuclear Engineering of The University of Tokyo in 1970. Dr. Kondo became the Lecturer, in 1970, then an Associate Professor in 1971 at the Department of Nuclear Engineering, The University of Tokyo. After that, he became a Professor at Nuclear Engineering Research Laboratory, The University of Tokyo in 1984.

He moved to the Department of Nuclear Engineering, The University of Tokyo in 1988 and remained there until his retirement in 2004. The Department name was changed to Quantum Engineering and Systems Science in 1995. In addition, he was appointed to the Director, Research Institute for Nuclear Science and Technology, The University of Tokyo from 1999-2003. After he retired from the The University of Tokyo, he became the Chairman, Japan Atomic Energy Commission in 2004.

Marilyn C. Kray is the Vice President of Project Development for Exelon Nuclear and President of NuStart Energy Development, LLC, an industry consortium formed to pursue a Combined Operating License for a new nuclear plant in the U.S. Prior to this assignment, Mrs. Kray was the Vice President of Nuclear Acquisition Support and Integration. She began her career with Exelon in the licensing organization for Peach Bottom Atomic Power Station. Prior to that, she was a Reactor Engineer and a Project Manager for the U.S. Nuclear Regulatory Commission (USNRC).
Mrs. Kray is a graduate of Carnegie-Mellon University with a B.S. degree in Chemical Engineering. She has served in a variety of leadership roles and has received many awards for her contributions, including the Utility Leadership Award presented by the American Nuclear Society in 2007.

Bill McCollum is Chief Operating Officer at the Tennessee Valley Authority, the nation's largest public power provider. Mr. McCollum joined TVA earlier this year after 32 years with Duke Energy. He began his career at Duke's Oconee Power Plant and advanced through positions in reactor engineering, construction and project management, strategic planning, overall nuclear site operations, nuclear support, and fossil and hydro generation. In 2006 he was named Group Executive and Chief Regulated Generation Officer, where he was responsible for all 22,000 megawatts of Duke's non-nuclear generation. Mr. McCollum holds Bachelors and Masters degrees in engineering from Georgia Tech and an MBA from the University of North Carolina at Charlotte.

Dr. Patrick Moore "The Sensible Environmentalist." For over 30 years, he has been a leader in the international environmental field. He is a co-founder of Greenpeace and served for nine years as President of Greenpeace Canada and seven years as a Director of Greenpeace International. Currently, Dr. Moore serves as the Chair and Chief Scientist of Greenspirit Strategies. In recent years, Dr. Moore has been focused on the promotion of sustainability and consensus building among competing concerns. He was a member of British Columbia's government-appointed Round Table on the Environment and Economy from 1990 - 1994. In 1990, Dr. Moore founded and chaired the BC Carbon Project. Dr. Moore served for four years as Vice President, Environment for Waterfurnace International, a manufacturer of geothermal heat pumps for residential heating and cooling with renewable earth energy. He is now Director of NextEnergy Solutions, the largest distributor of geothermal systems in Canada. From 1991-2002, he was the Chair of the Sustainable Forestry Committee of the Forest Alliance of BC. In 2000, Dr. Moore published *Green Spirit – Trees are the Answer*.

Jerry Paul, J.D., is the President and Managing Member of Capitol Energy, LLC. He also serves as the Distinguished Fellow on Energy Policy in the Howard H. Baker Jr. Center for Public Policy at the University of Tennessee. Mr. Paul, a nuclear engineer and attorney, formerly served as America's Chief Operating Officer and Deputy Administrator of the U.S. National Nuclear Security Administration (NNSA) and as the elected representative of Florida's 71st district in the Florida House of Representatives. He has served as a member of the U.S. Dept. of Energy Nuclear Energy Research Advisory Committee and as the Florida representative for both the Southern States Energy Board and the National Conference of Legislators Committees on Environmental and Natural Resources. Mr. Paul holds a law degree from Stetson University College of Law, a bachelor's degree in marine engineering from the Merchant Marine Academy in Castine, ME, and a post-baccalaureate degree in nuclear engineering from the University of Florida.

Daniel Poneman, J.D., is Principal of The Scowcroft Group and Senior Fellow of The Forum for International Policy. He served from 1993 to 1996 as Special Assistant to the President and Senior Director for Nonproliferation and Export Controls at the National Security Council (NSC), with responsibility for such areas as nuclear cooperation, missile technology and space-launch activities, sanctions determinations, chemical and biological arms control efforts, and conventional arms transfer policy. Mr. Poneman joined the NSC in 1990 as Director of Defense Policy and Arms Control, after serving in the Department of Energy. He has participated in several federal advisory panels, including the Commission to Assess the Organization of the Federal Government to Combat the Proliferation of Weapons of Mass Destruction. Mr. Poneman has written numerous articles on foreign policy and security issues, and has been an on-air contributor to CNN, Fox News, NPR, and other television and radio networks. He is the author of *Nuclear Power in the Developing World* (1982), *Argentina: Democracy on Trial* (1987), and co-author of *Going Critical: The First North Korean Nuclear Crisis* (2004), winner of the American Academy of Diplomacy's 2005 Douglas Dillon Award for Distinguished Writing on American Diplomacy. He received his A.B. and J.D. degrees from Harvard University and an M.Litt. in politics from Oxford University. Mr. Poneman is a member of the Aspen Strategy Group.

Dr. Farzad Rahnema received his PhD from the University of California in Los Angeles in 1981. He joined Georgia Institute of Technology in October 1992 and is currently Professor and Chair of the Nuclear and Radiological Engineering and Medical Physics Programs. From 1981 to 1992, Dr. Rahnema worked for General Electric, Nuclear Energy (GENE). He was responsible for GE's 3-D Nuclear/Thermal Hydraulics BWR Core Simulator PANACEA and Monte Carlo Benchmark Methods. He led the development of three versions (8-10) of the simulator. At Georgia Tech, Dr. Rahnema's research activity has been in the areas of computational reactor physics, transport theory and criticality safety. He is a Fellow of the American Nuclear Society (ANS), is currently Chair of the Nuclear Engineering Department Heads Organization (NEDHO) for July 2007 – June 2008 and Chairman of the SUNRISE Board of Directors since January 1, 2007. He chaired the ANS Mathematics and Computation Division in 1999 and is currently Chair of the ANS Reactor Physics Division.

Richard E. Reimels is president of The Babcock & Wilcox Companies Nuclear Power Generator Group (NPG), headquartered in Lynchburg, VA. As a division of The Babcock & Wilcox Companies, NPG provides services and components to the worldwide commercial nuclear utility industry. Prior to being named to his current position in January 2007, Mr. Reimels was president of B&W Canada, responsible for the design and supply of nuclear and fossil generator equipment and services. Previous positions included vice president of International Service, responsible for B&W's international after-market service business, international joint ventures, serving as acting general manager of Babcock & Wilcox Volund, as director of Project Services for the B&W Fossil Power Division and as general manager, Allen-Sherman-Hoff, which is a division of B&W's Diamond Power International, Inc. subsidiary. Mr. Reimels holds a bachelor's degree of Nuclear Science from State University of New York, Maritime College, and a master's degree in Mechanical Engineering from the University of Houston. He is a Registered Professional Engineer in the State of New York. The Babcock & Wilcox Companies is a subsidiary of McDermott International, Inc. (NYSE:MDR), a leading worldwide energy services company. McDermott subsidiaries manufacture steam-generating equipment, environmental equipment, and products for the U.S. government. They also provide engineering and construction services for the offshore oil and natural gas industries.

Dr. Victor H. Reis is Senior Advisor in the Office of the Secretary at the Department of Energy, where he is leading the Nuclear Integration Project. He is also a member of the Strategic Advisory Group of the U.S. Strategic Command. His past government appointments include serving as Director of the Defense Advanced Research Projects Agency (DARPA), Director of Defense Research and Engineering (DDR&E**)** at the Pentagon and Assistant Director for National Security and Space, Office of Science and Technology Policy, Executive Office of the President, (OSTP). He has chaired and served on numerous government

and laboratory committees and panels. He also served as Assistant Secretary of Energy for Defense Programs, and led the Stockpile Stewardship Program (1993-1999). Dr. Reis earned a B.M.E. in Mechanical Engineering from the Rensselaer Polytechnic Institute, (1957) an M.Eng. in Mechanical Engineering from Yale University (1958); and an M.A. and Ph.D.(1962) from Princeton University. He has authored numerous scientific and policy publications, and his awards include two Department of Defense Distinguished Public Service Medals.

Ambassador C. Paul Robinson served as President and Laboratories Director of Sandia National Laboratories —one of the nation's leading R & D institutions— from 1995 to 2005 and today serves as President Emeritus. He previously served as Chief Negotiator and U.S. Ambassador to the Nuclear Testing Talks under Presidents Ronald Reagan and George H.W. Bush. He spent his early career at the Los Alamos National Laboratory and in the nuclear industry at Ebasco Services, Inc. He holds a Bachelors and a Ph. D. in Physics and was elected to the National Academy of Engineering. Amb. Robinson currently serves on the U.S. State Department Council on International Security, the Strategic Advisory Group of U.S. Strategic Command, the NASA Advisory Council, and other government and private advisory groups. He also serves as a Co-Chairman of the American Council on Global Nuclear Competitiveness.

Dr. Eugene (Gene) A. Rosa is the Edward R. Meyer Professor of Natural Resource and Environmental Policy in the Thomas S. Foley Institute for Public Policy and Public Service and Professor of Sociology at Washington State University. An expert on public understanding and response to risk Professor Rosa has followed the trends in public attitudes toward nuclear power for over two decades and has published a variety of articles and co-edited two books on the topic.

Dr. Geoffrey Rothwell has been teaching at Stanford since 1986. He is the Associate Director of Public Policy and Director of the Honors Programs in the Department of Economics and in the Public Policy Program. He received his Ph.D. in Economics in 1985 from the University of California, Berkeley, and held a Post-Doctoral Fellowship at the California Institute of Technology. He has served in many positions with the Generation IV International Forum, and he is currently serving on a National Academy of Sciences' review of nuclear power research and development programs at the U.S. Department of Energy. He has published dozens of articles, reports, and books on all aspects of nuclear power economics. He has written on the nuclear power and electricity systems of China, France, Japan, and Russia. His current research focuses on modeling international nuclear fuel and nuclear power markets during the 21st century.

Adam Sacks has managed a wide range of economic consulting engagements over the past 13 years. His public sector clients have spanned multiple organizations within the U.S. government at the national, state, and city levels including the U.S. Department of Commerce, 10 states, and 12 cities. He has also represented various industry associations such as the U.S. Council on Competitiveness and the U.S. Conference of Mayors. Globally, Adam represents multi-national companies seeking to understand their market risks and opportunities as the world economy evolves. Adam has worked intensively with a firms seeking to obtain tax incentives for large real estate developments and the implementation of renewable energy technologies. He has a BA in Economics and International Business from Lehigh University.

Leonard S. Spector is Deputy Director of the Monterey Institute's James Martin Center for Nonproliferation Studies. Currently, he heads the Center's Washington, D.C. office and is Editor-in-Chief of the monthly web-based journal, *WMD Insights*. From 1997 to 2001, Mr. Spector served as Assistant Deputy Administrator for Arms Control and Nonproliferation at the National Nuclear Security Administration of the U.S. Department of Energy (DOE). Before joining DOE, he led the Nuclear Nonproliferation Project of the Carnegie Endowment for International Peace. Earlier in his career, he served as Chief Counsel of the Senate Energy and Nonproliferation Subcommittee and as a Special Counsel

at the U.S. Nuclear Regulatory Commission. The author of six books and numerous articles, Mr. Spector appears frequently on television and radio as a commentator on nuclear affairs.

Dennis Spurgeon is the first Assistant Secretary for Nuclear Energy (NE) at the Department of Energy in more than a decade. Most recently, he served as Executive Vice President and Chief Operating Office for USEC, Inc. Prior to that, he served as Chairman, Chief Executive Officer and principal owner of Swiftships. He held posts in the Ford administration, including an assignment as Assistant Director for Fuel Cycle in the U.S. Energy Research and Development Administration. He also held executive positions at the former United Nuclear Corporation and previously worked for the General Atomic Company. He served in the U.S. Navy, achieving the rank of Captain. He graduated with distinction from the U.S. Naval Academy. He holds a Masters of Science in nuclear engineering and the degree of Nuclear Engineer from the Massachusetts Institute of Technology.

Steve Tritch is responsible for all Westinghouse global operations. He became president and CEO of Westinghouse July 1, 2002. Prior to his appointment, Mr. Tritch served as senior vice president of Nuclear Fuel; he also successfully managed the integration of the former ABB nuclear businesses into Westinghouse Electric Company and was senior vice president of Nuclear Services. He has held numerous managerial and general manager positions since he began his Westinghouse career in 1971 as a product engineer. He holds a B.S. in mechanical engineering and an M.B.A. from the University of Pittsburgh. His most recent of many accomplishments include his election as a Trustee for the University of Pittsburgh and to the Board of Turstees for the Senator John Heinz History Center in Pittsburgh**,** and his appointment by President Bush to the President's Export Council.

Michael Wallace is President and CEO of Constellation Energy Nuclear Group, which includes nuclear generation of 3,869 megawatts, three sites and five units in two states. Prior to joining Constellation Energy Group, he was Co-Founder and Managing Director of Barrington Energy Partners, LLC, a strategic consulting firm specializing in energy industry transactions and advisory services. Before joining Barrington Energy, Mr. Wallace had more than 25 years of senior executive and utility operations experience with ComEd and during his tenure he had responsibility for the completion of the Braidwood and Byron Nuclear Stations of Commonwealth Edison. Mr. Wallace has a B.S. in electrical engineering from Marquette University and a M.B.A. from the University of Chicago, with a specialization in finance. He also served as a naval officer in the U.S. Navy nuclear submarine force.

Rep. Zach Wamp serves as the Ranking Member of the Legislative Branch Subcommittee of Appropriations and is also the second most senior Republican on the Energy and Water Subcommittee of Appropriations. Having served as Chairman of the House Republican Policy Energy and Technology Subcommittee, he crafted the Republican Policy's energy platform in the 109th Congress. He also serves as Co-Chairman of the 221-member Renewable Energy and Energy Efficiency Caucus. Congressman Wamp spent twelve years as a small businessman and commercial real estate broker before being elected to Congress.

John K. Welch is president and chief executive officer of USEC Inc. Mr. Welch joined USEC in October 2005. He also serves on the Company's board of directors. Mr. Welch previously served as executive vice president of the Marine Systems Group at General Dynamics where he oversaw all operational aspects of four business units, including Electric Boat and Bath Iron Works. Prior to that, he held several executive positions over a 10-year period at Electric Boat, including five years as president. He most recently served as a consultant to several government and corporate entities in the areas of technology development and commercialization, program management, business process reengineering and strategic planning. Mr. Welch began his career as a submarine officer in the U.S. Navy. He went on to hold management positions with Advanced Technology, Inc. and General Physics Corporation before joining General Dynamics in

1989. Mr. Welch currently serves on the boards of Battelle Memorial Institute, the U.S. Naval Academy Foundation, the Nuclear Energy Institute (NEI) and the American Council on Global Nuclear Competitiveness. Mr. Welch received a master's in business administration from Loyola College in Maryland, a master of science in aeronautical engineering from the Naval Postgraduate School in California, and a bachelor of science in aerospace engineering from the U.S. Naval Academy. He is a registered professional engineer in the state of Maryland. USEC Inc. (NYSE: USU), a global energy company, is a leading supplier of enriched uranium fuel for commercial nuclear power plants.

Woodrow Wilson International Center for Scholars

THE UNIVERSITY of TENNESSEE Howard H. Baker Jr. Center for Public Policy

The Role of Nuclear Power in Global and Domestic Energy Policy:
Recent Developments and Future Expectations

Woodrow Wilson International Center for Scholars– 5th Floor Conference Room; Washington, DC

Wednesday October 3, 2007––International Focus

8:30 am	Coffee and Check-in
8:50 am	Welcome by **Alan Lowe** Howard H. Baker Jr. Center for Public Policy, The University of Tennessee
9:00 am	Remarks by **Senator Lamar Alexander** (TN)
9:15 am	Remarks by **Senator Howard H. Baker, Jr.** and **Representative Lee H. Hamilton**
9:30 am	Overview of the Conference by **Jerry Paul** Howard H. Baker Jr. Center for Public Policy
9:40 am	Remarks by **Representative Marsha Blackburn** (TN)
9:50 am	*The Role of Nuclear Power in Global and Japanese Energy Policy* **Shunsuke Kondo,** Japan Atomic Energy Commission
10:35 am	Break
10:50 am	*A Responsible Path Toward Nuclear Energy Development* **Alain Bugat**, French Atomic Energy Commission Discussant: **Leonard Spector,** Monterey Institute of International Studies
Noon	Keynote address by **Senator Howard H. Baker, Jr.**
12:30 pm	Buffet lunch
1:30 pm	*What Role Does Nuclear Energy Play in Global Climate Change Policy?* **Patrick Moore**, CASE Energy Coalition, Greenspirit Strategies Ltd., GreenPeace Discussant: **Steve Fetter**, University of Maryland, School of Public Policy
2:20 pm	*The Economics of International Supplier State and Recipient State Regimes for Worldwide Nuclear Fuel Services* **Geoffrey Rothwell**, Stanford University – Introduced by **Vic Reis**
3:00 pm	Break
3:10 pm	*Nonproliferation Aspects of Expanded Nuclear Energy* **Larry Brown,** Defense Nuclear Facilities Safety Board **Daniel Poneman,** The Scowcroft Group
4:05 pm	*Building International Cooperation in Nuclear Energy* **Ambassador Robert Joseph,** National Institute of Public Policy

With thanks to our sponsors:
Booz Allen and Hamilton and the Southern Nuclear Operating Company

Thursday October 4, 2007 -- Domestic Focus – 5th Floor Conference Room

8:30 am	Coffee and check-in
8:45 am	Welcome by **Jerry Paul** Howard H. Baker Jr. Center for Public Policy, The University of Tennessee
8:50 am	Welcome by **Senator Howard H. Baker, Jr.**
9:00 am	Remarks by **Congressman Zach Wamp** (TN)
9:10 am	Remarks by **Senator Bob Corker** (TN)
9:20 am	*The Economics and Financing of New Nuclear Power Plants: A Financial Community Perspective* by **Jim Asselstine**
10:05 am	*The Nuclear Fuel Cycle in America – Present and Future* **Dennis Spurgeon**, U.S. Department of Energy
11:00 am	Break
11:10 am	Panel Discussion: *New Nuclear Plant Development Decision Making – Perspectives from the Boardroom* Facilitated by **Admiral Skip Bowman**, U.S. Nuclear Energy Institute **Barnie Beasley**, Southern Nuclear; **Mike Wallace**, Constellation Energy Nuclear Group; **Bill McCollum**, Tennessee Valley Authority; **Tom Flaherty**, Booz, Allen, and Hamilton; and **Marilyn Kray**, NuStart Energy
Noon	Remarks by **Dale Klein,** U.S. Nuclear Regulatory Commission
12:30 pm	Buffet Lunch
1:15 pm	Keynote Address by the **Honorable Samuel Bodman**, U.S. Department of Energy Introduced by **Senator Howard H. Baker, Jr.**
1:45 pm	*Alternative Views – Considering the Critique of Nuclear Power* **Eugene A. Rosa**, Thomas S. Foley Institute for Public Policy and Public Service, Washington State University **Charles D. Ferguson**, Council on Foreign Relations
2:30 pm	*Nuclear Power Plant Security: A Discussion of Realities, Concerns and Conclusions* **Jerry Paul**
3:00 pm	Break
3:10 pm	*The American Nuclear Renaissance: What's at Stake for Jobs, the Environment and Economic Growth* **Bennett Johnston,** American Council on Nuclear Competitiveness, and **Adam Sacks**, Oxford Economics – Introduced by **Ambassador Paul Robinson**
3:45 pm	Panel Discussion*: The Evolving Nuclear Power Supply Chain* Facilitated by **Ambassador Paul Robinson,** American Council for Nuclear Competitiveness **Steve Tritch**, Westinghouse ; **Richard Reimels**, BWXT; Commercial Nuclear Inc.; **Steve Creamer**, EnergySolutions; **Tom Christopher**, AREVA; **Steve Hucik,** General Electric-Hitachi Nuclear Energy; **Farzad Rahnema**, Georgia Institute of Technology; and **John Welch**, USEC

With thanks to our sponsors:
Booz Allen and Hamilton and the Southern Nuclear Operating Company