

STATEMENT OF
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ON THE FY 2009 BUDGET REQUEST

BEFORE THE

SENATE COMMITTEE ON APPROPRIATIONS
SUBCOMMITTEE ON ENERGY AND WATER

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Chairman Dorgan, Ranking Member Domenici, and Members of the Subcommittee, it is a pleasure to be here today to discuss the President's Fiscal Year 2009 budget request for the Department of Energy's (DOE) Office of Nuclear Energy.

Our nation's strength and prosperity is built on our security and the availability of reliable sources of energy. The President's \$25 billion Fiscal Year 2009 budget request for the Department aggressively addresses the growing demand for affordable, clean, and reliable energy and helps preserve our national security by working to further our energy security. A cornerstone to the goals of continued economic growth and a sustainable energy future is nuclear power. The Office of Nuclear Energy's budget request ambitiously supports the near-term expansion of safe, reliable and carbon-free nuclear power and the development of advanced nuclear technologies now and into the future. It is significant to note that this Administration has increased its funding request for nuclear energy in every year, and in total, the FY 2009 request represents a 330 percent increase in funding for nuclear energy since President Bush took office seven years ago. In FY 2009, a total of \$1.4 billion is requested for nuclear energy activities including \$487 million for the Mixed Oxide Fuel Fabrication Facility.

The President's commitment to nuclear power stems from its role as the only viable near-term option for producing significant amounts of emissions-free, baseload electricity. The expansion of nuclear power will play a key role in our decisions to find viable solutions to address the challenges posed by greenhouse gas emissions, climate change, and energy security while promoting a vibrant economy.

Today, 104 nuclear reactors generate nearly 20 percent of America's electricity and account for nearly 70 percent of electricity produced from non-emitting sources. Last month, the Nuclear Energy Institute reported that U.S. reactors produced 807 billion kilowatt hours of electricity in 2007—enough to power more than 72 million homes for a year. That total surpasses the previous record high of 788.5 billion kilowatt hours in 2004. However, for nuclear power to maintain its role in our energy supply, it must grow. To sustain nuclear power's current 20 percent share, forty to forty-five new reactors must be built by 2030.

Worldwide, thirty-one countries operate 439 reactors totaling 372 GWe of electricity capacity. Thirty-four new nuclear power plants are under construction worldwide, and when completed, will add an additional 28 GWe of new electricity. This new construction is taking place or being considered in every major region in the world including Africa, Asia and the Indian subcontinent, Europe, the Middle East, South America, and North America.

We have recently seen projections that anticipate 55 total countries will operate 630 reactors totaling approximately 630 GWe by 2030. Potentially, a total of 86 countries could have nuclear reactors by 2050.

Internationally, nuclear power is moving forward at a rapid pace with each month seemingly bringing new, significant announcements.

Nuclear power's ongoing expansion around the world requires us to address the used fuel and proliferation challenges that confront the global use of nuclear energy. To ensure that the United States plays a significant role in global nuclear energy policy, we must foster a robust domestic nuclear research and development program that maintains a cutting-edge nuclear technology infrastructure, and encourage international actions that support reliable nuclear fuel services as a viable option for countries that may otherwise consider the development and deployment of enrichment and reprocessing technologies. To meet these challenges, the President initiated the Global Nuclear Energy Partnership (GNEP). The domestic component of GNEP promotes the accelerated development and deployment of advanced fuel cycle technologies, while the international component encourages cooperation among States that share the common vision of the necessity of the expansion of nuclear energy for peaceful purposes worldwide in a safe and secure manner.

We have made marked progress in every one of our program areas, but much remains to be done. Our FY 2009 budget request moves us in the right direction, allowing the Department and the Office of Nuclear Energy to take the lead in spurring the nuclear renaissance in the United States. I would now like to take the time to highlight our program areas and their corresponding budget requests.

Nuclear Power 2010

A key component of our work and one of our most successful programs at the Department of Energy is the Nuclear Power 2010 program or NP 2010. This program was initiated by President Bush in 2002 and has produced significant results toward its goal of reducing the technical, regulatory, and institutional barriers to the deployment of new nuclear power plants. DOE and the President have increased our commitment to cross the finish line by nearly doubling its 2009 budget, calling on Congress to provide \$241.6 million for NP 2010 to help ensure this important program can complete its work.

NP 2010 supports industry through cost-sharing near-term technology development and regulatory demonstration activities focused on enabling an industry decision to build a new nuclear plant by 2010.

Of the six Construction and Operation License (COL) applications that have been submitted to the Nuclear Regulatory Commission (NRC), five COL applications have been officially accepted for review by the NRC. And of these five, two applications—TVA's application for two Westinghouse AP1000 reactors at the Bellefonte site in Alabama, and Dominion Energy's application for a General Electric-Hitachi Economic Simplified Boiling Water Reactor at the North Anna site in Virginia—were developed through the NP 2010 cost-share program. In total, the NRC expects to receive twenty COL applications for thirty-one new reactors by seventeen different utility companies. Of these 20 COL applications, eight will reference either the Bellefonte or North Anna license applications. This simplification in the licensing process is expected to reduce the license application and review time these reference COLAs by up to 50 percent.

Three early site permits have been approved for Exelon's Clinton site in Illinois, Entergy's Grand Gulf site in Mississippi, and the North Anna site, all a part of the NP 2010 cost share program, and a fourth ESP permit is pending. In addition, two new reactor design certifications have been approved by the NRC, the ABWR and the AP1000, and DOE is continuing with on-going first-of-a-kind design finalization activities for the standardized AP1000 and ESBWR designs, including: preparation of engineering analyses and calculations, design criteria documents, and total cost and schedule estimates necessary for an industry purchase of a new nuclear plant.

The NP 2010 program will continue to develop generic application preparation guidance for fifteen COL applications expected in 2008 to help resolve regulatory issues that could potentially delay or derail NRC approval.

Advanced Fuel Cycle Initiative and GNEP

President Bush announced the Global Nuclear Energy Partnership (GNEP) as part of his Advanced Energy Initiative in February 2006. The Advanced Fuel Cycle Initiative (AFCI) is the domestic technology development and deployment component of GNEP. The AFCI program aims to develop and demonstrate advanced fuel cycle technologies for recycling used reactor fuel to develop an integrated used fuel recycling plan, and support on-going research efforts with the goal of reducing the amount of material that needs disposal in a geologic repository and maximizing our use of energy resources.

In effort to further this important work, our budget request includes \$301.5 million in Fiscal Year 2009 funding for AFCI. This request supports research and development activities that will advance the economic and sustained production of nuclear energy while reducing waste and satisfying requirements for a controlled nuclear materials management system that helps strengthen the nuclear nonproliferation regime. The request also supports on-going international activities to establish a framework for ensuring reliable international fuel services and the availability of grid-appropriate reactors, and the continued utilization of industry for schedule, cost, and technology developments for eventual recycling facility deployment.

Long-term goals of AFCI/GNEP include the partitioning of used fuel and recycling of long-lived radioactive isotopes for destruction through transmutation in liquid metal-cooled fast neutron spectrum reactors for actinide consumption and nuclear resource sustainability

AFCI/GNEP funding also provides support for a large number of universities involved in fuel cycle research and development, which both ensures that the U.S. has the intellectual capital needed to sustain our nuclear fuel cycle for the future and provides the important research needed for today's fuel cycle activities. Recycling used nuclear fuel rather than permanently disposing of it in a repository would result not only in utilizing more of the energy, but would also reduce the amount of high-level waste that needs disposal in a repository, thereby greatly enhancing the potential capacity of any geological repository. This increased efficiency in the fuel supply could ensure that even with the expansion of nuclear energy, the potential capacity of any geological repository would be greatly enhanced.

Generation IV

The Generation IV program is focused on very high temperature reactor technologies for use in a Next Generation Nuclear Power Plant (NGNP) to produce electricity, process heat, and hydrogen. Generation IV also is readying technologies that will further improve the economics and safety performance of existing Light-Water Reactor and advanced Generation IV reactor concepts.

The FY 2009 budget request includes \$70 million for the Generation IV program. The Energy Policy Act of 2005 (EPACT) authorized the Department to create a two-phased NGNP Project at the Idaho National Laboratory (INL). The Department is presently engaged in Phase I of the EPACT-defined scope of work, which includes: developing a licensing strategy, selecting and validating the appropriate hydrogen production technology, conducting enabling research and development for the reactor system, determining whether it is appropriate to combine electricity generation and hydrogen production in a single prototype nuclear reactor and plant, and establishing key design parameters. Phase I will continue until 2011, at which time the Department will evaluate the need for continuing into the design and construction activities called for in Phase II.

Additionally, this request supports component and material aging and degradation research and development that will provide the basis for extending the operating license period for existing nuclear reactors beyond 60 years, and will also enable the design of advanced reactor concept plants with longer operating life spans.

Hydrogen Initiative

Nuclear energy has the potential to produce large quantities of hydrogen efficiently without producing greenhouse gases and could play a significant role in hydrogen production for transportation and industrial sectors. Considerable progress in hydrogen combustion engines and fuel cells is bringing hydrogen-powered transportation close to reality. The goal of the Nuclear Hydrogen Initiative (NHI) is to demonstrate hydrogen production technology at increasingly larger scales through the use of nuclear energy that would be technically and economically suited for commercial deployment in concert with a nuclear power plant.

\$16.6 million dollars has been requested for the NHI to continue hydrogen production systems operation and testing, evaluation of process improvements, and assessment of long-term process stability, operability, and component durability. Furthermore, results from the integrated laboratory-scale experiments will be analyzed to identify cost drivers with an end goal of supporting a hydrogen technology selection by 2011.

Nuclear Facilities

The Department of Energy supports nuclear science and technology through one of the world's most comprehensive research infrastructures. The Office of Nuclear Energy has requested \$222 million dollars to maintain and operate infrastructure at Idaho National Laboratory (INL), Los Alamos National Laboratory (LANL), Brookhaven National Laboratory (BNL), and Oak Ridge National Laboratory (ORNL). \$104.7 million is dedicated to Idaho National Laboratory's facilities management. INL conducts science and technology research across a wide range of disciplines, INL's core missions include: development of advanced, next generation fuel cycle and reactor technologies; promotion of nuclear technology education, and applying technical skills to enhance our Nation's security.

Additionally, \$38.7 million is requested to maintain a wide range of nuclear and radiological facilities and their associated infrastructures in an operational, safe, secure, and environmentally compliant manner at LANL, BNL, and ORNL. This infrastructure supports national priorities, including the provision of radioisotope power systems for national security uses and space exploration.

Other Defense Activities

Included in the Office of Nuclear Energy Fiscal Year 2009 request, under Other Defensive activities, is \$487 million for activities associated with the continued construction of the Mixed Oxide Fuel Fabrication Facility and \$78.8 million for site-wide safeguards and security activities at the Idaho National Laboratory to protect the assets and infrastructure from theft, diversion, sabotage, espionage, unauthorized access, compromise, and other hostile acts that may cause unacceptable adverse impacts on national security, program continuity, or the health and safety of employees, the public, or the environment.

University Funding

Our FY 2009 budget request continues our commitment to fostering the expansion of nuclear engineering programs at our universities and research institutions. Specifically, the budget request for the Office of Nuclear Energy explicitly states that we "will continue to support R&D activities at universities and research institutions through competitive awards focused on advancing nuclear energy technologies," and we have committed to "designate 20 percent of funds appropriated to its R&D programs for work to be performed at university and research institutions." These funds will support basic research and mission-specific applied R&D activities, as well as human capital development activities, such as fellowships and infrastructure and equipment upgrades for university-based research reactors and laboratories. At the level set forth in the President's Budget Request for FY 2009, 20 percent provides almost \$77 million for this work. This commitment of 20 percent of appropriated funds will serve as a catalyst for success in achieving the objectives of the President's American Competitiveness Initiative and the America COMPETES Act.

This concludes my prepared statement. I would be pleased to answer any questions you may have.