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Subtitle C—Nuclear and Advanced Technologies

SEC. 131. FINDINGS AND POLICY.

(a) FINDINGS.—Congress finds that—

(1) in 2008, 104 nuclear power plants produced 19.6 percent of the electricity generated in the United States, slightly less than the electricity generated by natural gas;

(2) nuclear energy is the largest provider of clean, low-carbon, electricity, almost 8 times larger than all renewable power production combined, excluding hydroelectric power;

(3) nuclear energy supplies consistent, base-load electricity, independent of environmental conditions;

(4) by displacing fossil fuels that would otherwise be used for electricity production, nuclear power plants virtually eliminate emissions of greenhouse gases and criteria pollutants associated with acid
rain, smog, or ozone;

(5) nuclear power generation continues to require robust efforts to address issues of safety, waste, and proliferation;

(6) even if every nuclear plant is granted a 20- year extension, all currently operating nuclear plants will be retired by 2055;

(7) long lead times for nuclear power plant construction indicate that action to stimulate the nuclear power industry should not be delayed;

(8) the high upfront capital costs of nuclear plant construction remain a substantial obstacle, despite theoretical potential for significant cost reduction;

(9) translating theoretical cost reduction potential into actual reduced construction costs remains a significant industry challenge that can be overcome only through demonstrated performance;

(10) as of January 2009, 17 companies and consortia have submitted applications to the Nuclear Regulatory Commission for 26 new reactors in the United States;

(11) those proposed reactors will use the latest in nuclear technology for efficiency and safety, more advanced than the technology of the 1960s and 1970s found in the reactors currently operating in the United States;

(12) increased resources for the Nuclear Regulatory Commission and reform of the licensing process have improved the safety and timeliness of the regulatory environment;

(13) the United States has not built a new reactor since the 1970s and, as a result, will need to revitalize and retool the institutions and infrastructure necessary to construct, maintain, and support new reactors, including improvements in manufacturing of nuclear components and training for the next generation nuclear workforce; and

(14) those new reactors will launch a new era for the nuclear industry, and translate into tens of thousands of jobs

(b) STATEMENT OF POLICY.—It is the policy of the United States, given the importance of transitioning to a clean energy, low-carbon economy, to facilitate the continued development and growth of a safe and clean nuclear energy industry, through—

(1) reductions in financial and technical barriers to construction and operation; and

(2) incentives for the development of a well-trained workforce and the growth of safe domestic nuclear and nuclear-related industries.

SEC. 132. NUCLEAR WORKER TRAINING.

(a) DEFINITION OF APPLICABLE PERIOD.—In this section, the term ''applicable period'' means—

(1) the 5-year period beginning on January 1, 2012; and

(2) each 5-year period beginning on each January 1 thereafter.

(b) USE OF FUNDS.—Of amounts made available to carry out this section for the calendar years in each applicable period—

(1) the Secretary of Energy shall use such amounts for each applicable period as the Secretary of Energy determines to be necessary to increase the number and amounts of nuclear science talent expansion grants and nuclear science competitiveness grants provided under section 5004 of the America COMPETES Act (42 U.S.C. 16532); and

(2) the Secretary of Labor, in consultation with nuclear energy entities and organized labor, shall use such amounts for each applicable period as the Secretary of Labor determines to be necessary to carry out programs expanding workforce training to meet the high demand for workers skilled in nuclear power plant construction and operation, including programs for—

(A) electrical craft certification;

(B) preapprenticeship career technical education for industrialized skilled crafts that are useful in the construction of nuclear power plants;

(C) community college and skill center training for nuclear power plant technicians;

(D) training of construction management personnel for nuclear power plant construction projects; and

(E) regional grants for integrated nuclear energy workforce development programs.

SEC. 133. NUCLEAR SAFETY AND WASTE MANAGEMENT PROGRAMS.

(a) NUCLEAR FACILITY LONG-TERM OPERATIONS RESEARCH AND DEVELOPMENT PROGRAM.—

(1) ESTABLISHMENT.—As soon as practicable after the date of enactment of this Act, the Sec- retary of Energy (referred to in this section as the ''Secretary'') shall establish a research and development program—

(A) to address the reliability, availability, productivity, component aging, safety, and secu- rity of nuclear power plants;

(B) to improve the performance of nuclear power plants;

(C) to sustain the health and safety of employees of nuclear power plants;

(D) to assess the feasibility of nuclear power plants to continue to provide clean and economic electricity safely, substantially beyond the first license extension period of the nuclear power plants, which will—

(i) significantly contribute to the energy security of the United States; and

(ii) help protect the environment of the United States; and (E) to support significant carbon reductions, lower overall costs that are required to reduce carbon emissions, and increase energy security.

(2) CONDUCT OF PROGRAM.—

(A) IN GENERAL.—In carrying out the program established under paragraph (1), the Secretary shall—

(i) build a fundamental scientific basis to understand, predict, and measure changes in materials, systems, structures, equipment, and components as the materials, systems, structures, equipment, and components age through continued operations in long-term service environments;

(ii) develop new safety analysis tools and methods to enhance the performance and safety of nuclear power plants;

(iii) develop advanced online monitoring, control, and diagnostics technologies to prevent equipment failures and improve the safety of nuclear power plants;

(iv) establish a technical basis for advanced fuel designs (including silicon carbide fuel cladding) to increase the safety margins of nuclear power plants; and

(v) examine issues, including—

(I) issues relating to material degradation, plant aging, and technology upgrades; and

(II) any other issue that would impact decisions to extend the lifespan of nuclear power plants.

(B) TECHNICAL SUPPORT.—In carrying out the program established under paragraph (1), the Secretary shall provide to the Chairman of the Nuclear Regulatory Commission information collected under the program—

(i) to help ensure informed decisions regarding the extension of the life of nuclear power plants beyond a 60-year life- span; and

(ii) for the licensing and long-term management, and safe and economical op- eration, of nuclear power plants.

(b) SPENT NUCLEAR WASTE DISPOSAL RESEARCH DEVELOPMENT PROGRAM.—

(1) ESTABLISHMENT.—As soon as practicable after the date of enactment of this Act, the Secretary shall establish a research and development program

to improve the understanding of nuclear spent fuel management and the entire nuclear fuel cycle life.

(2) CONDUCT OF PROGRAM.—In carrying out the program established under paragraph (1), the Secretary shall carry out science-based research and development activities to pursue dramatic improvements in a range of nuclear spent fuel management options, including short-term and long-term storage and disposal, and proliferation-resistant nuclear spent fuel recycling.

(c) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated such sums as are necessary to carry out this section.