

(1) Enhancing nuclear power's viability as part of the United States energy portfolio.

(2) Providing the technical means to reduce the likelihood of nuclear proliferation.

(3) Maintaining a cadre of nuclear scientists and engineers.

(4) Maintaining National Laboratory and university nuclear programs, including their infrastructure.

(5) Supporting both individual researchers and multidisciplinary teams of researchers to pioneer new approaches in nuclear energy, science, and technology.

(6) Developing, planning, constructing, acquiring, and operating special equipment and facilities for the use of researchers.

(7) Supporting technology transfer and other appropriate activities to assist the nuclear energy industry, and other users of nuclear science and engineering, including activities addressing reliability, availability, productivity, component aging, safety, and security of nuclear power plants.

(8) Reducing the environmental impact of nuclear energy-related activities.

(b) Authorization of appropriations for core programs

There are authorized to be appropriated to the Secretary to carry out nuclear energy research, development, demonstration, and commercial application activities, including activities authorized under this part, other than those described in subsection (c)—

- (1) \$330,000,000 for fiscal year 2007;
- (2) \$355,000,000 for fiscal year 2008; and
- (3) \$495,000,000 for fiscal year 2009.

(c) Nuclear infrastructure and facilities

There are authorized to be appropriated to the Secretary to carry out activities under section 16275 of this title—

- (1) \$135,000,000 for fiscal year 2007;
- (2) \$140,000,000 for fiscal year 2008; and
- (3) \$145,000,000 for fiscal year 2009.

(d) Allocations

From amounts authorized under subsection (a), the following sums are authorized:

- (1) For activities under section 16273 of this title—
 - (A) \$150,000,000 for fiscal year 2007;
 - (B) \$155,000,000 for fiscal year 2008; and
 - (C) \$275,000,000 for fiscal year 2009.
- (2) For activities under section 16274 of this title—
 - (A) \$43,600,000 for fiscal year 2007;
 - (B) \$50,100,000 for fiscal year 2008; and
 - (C) \$56,000,000 for fiscal year 2009.
- (3) For activities under section 16277 of this title, \$6,000,000 for each of fiscal years 2007 through 2009.

(e) Limitation

None of the funds authorized under this section may be used to decommission the Fast Flux Test Facility.

(Pub. L. 109–58, title IX, §951, Aug. 8, 2005, 119 Stat. 884.)

§ 16272. Nuclear energy research programs

(a) Nuclear Energy Research Initiative

The Secretary shall carry out a Nuclear Energy Research Initiative for research and development related to nuclear energy.

(b) Nuclear Energy Systems Support Program

The Secretary shall carry out a Nuclear Energy Systems Support Program to support research and development activities addressing reliability, availability, productivity, component aging, safety, and security of existing nuclear power plants.

(c) Nuclear Power 2010 Program

(1) In general

The Secretary shall carry out a Nuclear Power 2010 Program, consistent with recommendations of the Nuclear Energy Research Advisory Committee of the Department in the report entitled “A Roadmap to Deploy New Nuclear Power Plants in the United States by 2010” and dated October 2001.

(2) Administration

The Program shall include—

(A) use of the expertise and capabilities of industry, institutions of higher education, and National Laboratories in evaluation of advanced nuclear fuel cycles and fuels testing;

(B) consideration of a variety of reactor designs suitable for both developed and developing nations;

(C) participation of international collaborators in research, development, and design efforts, as appropriate; and

(D) encouragement for participation by institutions of higher education and industry.

(d) Generation IV Nuclear Energy Systems Initiative

(1) In general

The Secretary shall carry out a Generation IV Nuclear Energy Systems Initiative to develop an overall technology plan for and to support research and development necessary to make an informed technical decision about the most promising candidates for eventual commercial application.

(2) Administration

In conducting the Initiative, the Secretary shall examine advanced proliferation-resistant and passively safe reactor designs, including designs that—

(A) are economically competitive with other electric power generation plants;

(B) have higher efficiency, lower cost, and improved safety compared to reactors in operation on August 8, 2005;

(C) use fuels that are proliferation resistant and have substantially reduced production of high-level waste per unit of output; and

(D) use improved instrumentation.

(e) Reactor production of hydrogen

The Secretary shall carry out research to examine designs for high-temperature reactors capable of producing large-scale quantities of hydrogen.

(Pub. L. 109–58, title IX, §952, Aug. 8, 2005, 119 Stat. 885.)

§ 16273. Advanced fuel cycle initiative

(a) In general

The Secretary, acting through the Director of the Office of Nuclear Energy, Science and Technology, shall conduct an advanced fuel recycling technology research, development, and demonstration program (referred to in this section as the “program”) to evaluate proliferation-resistant fuel recycling and transmutation technologies that minimize environmental and public health and safety impacts as an alternative to aqueous reprocessing technologies deployed as of August 8, 2005, in support of evaluation of alternative national strategies for spent nuclear fuel and the Generation IV advanced reactor concepts.

(b) Annual review

The program shall be subject to annual review by the Nuclear Energy Research Advisory Committee of the Department or other independent entity, as appropriate.

(c) International cooperation

In carrying out the program, the Secretary is encouraged to seek opportunities to enhance the progress of the program through international cooperation.

(d) Reports

The Secretary shall submit, as part of the annual budget submission of the Department, a report on the activities of the program.

(Pub. L. 109–58, title IX, §953, Aug. 8, 2005, 119 Stat. 886.)

§ 16274. University nuclear science and engineering support

(a) In general

The Secretary shall conduct a program to invest in human resources and infrastructure in the nuclear sciences and related fields, including health physics, nuclear engineering, and radiochemistry, consistent with missions of the Department related to civilian nuclear research, development, demonstration, and commercial application.

(b) Requirements

In carrying out the program under this section, the Secretary shall—

(1) conduct a graduate and undergraduate fellowship program to attract new and talented students, which may include fellowships for students to spend time at National Laboratories in the areas of nuclear science, engineering, and health physics with a member of the National Laboratory staff acting as a mentor;

(2) conduct a junior faculty research initiation grant program to assist universities in recruiting and retaining new faculty in the nuclear sciences and engineering by awarding grants to junior faculty for research on issues related to nuclear energy engineering and science;

(3) support fundamental nuclear sciences, engineering, and health physics research

through a nuclear engineering education and research program;

(4) encourage collaborative nuclear research among industry, National Laboratories, and universities; and

(5) support communication and outreach related to nuclear science, engineering, and health physics.

(c) University-National Laboratory interactions

The Secretary shall conduct—

(1) a fellowship program for professors at universities to spend sabbaticals at National Laboratories in the areas of nuclear science and technology; and

(2) a visiting scientist program in which National Laboratory staff can spend time in academic nuclear science and engineering departments.

(d) Strengthening university research and training reactors and associated infrastructure

In carrying out the program under this section, the Secretary may support—

(1) converting research reactors from high-enrichment fuels to low-enrichment fuels and upgrading operational instrumentation;

(2) consortia of universities to broaden access to university research reactors;

(3) student training programs, in collaboration with the United States nuclear industry, in relicensing and upgrading reactors, including through the provision of technical assistance; and

(4) reactor improvements as part of a taking into consideration effort that emphasizes research, training, and education, including through the Innovations in Nuclear Infrastructure and Education Program or any similar program.

(e) Operations and maintenance

Funding for a project provided under this section may be used for a portion of the operating and maintenance costs of a research reactor at a university used in the project.

(f) Definition

In this section, the term “junior faculty” means a faculty member who was awarded a doctorate less than 10 years before receipt of an award from the grant program described in subsection (b)(2).

(Pub. L. 109–58, title IX, §954, Aug. 8, 2005, 119 Stat. 886.)

§ 16274a. Integrated University Program

(a) The Secretary of Energy, along with the Administrator of the National Nuclear Security Administration and the Chairman of the Nuclear Regulatory Commission, shall establish an Integrated University Program.

(b) For the purposes of carrying out this section, \$45,000,000 is authorized to be appropriated in each of fiscal years 2009 to 2019 as follows:

(1) \$15,000,000 for the Department of Energy;

(2) \$15,000,000 for the Nuclear Regulatory Commission; and

(3) \$15,000,000 for the National Nuclear Security Administration.

(c) Of the amounts authorized to carry out this section, \$10,000,000 shall be used by each or-