

§ 16273. Fuel cycle research, development, demonstration, and commercial application

(a) Used nuclear fuel research, development, demonstration, and commercial application

(1) In general

The Secretary shall conduct an advanced fuel cycle research, development, demonstration, and commercial application program to improve fuel cycle performance, minimize environmental and public health and safety impacts, and support a variety of options for used nuclear fuel storage, use, and disposal, including advanced nuclear reactor and non-reactor concepts (such as radioisotope power systems), which may include—

- (A) dry cask storage;
- (B) consolidated interim storage;
- (C) deep geological storage and disposal, including mined repository, and other technologies;
- (D) used nuclear fuel transportation;
- (E) integrated waste management systems;
- (F) vitrification;
- (G) fuel recycling and transmutation technologies, including advanced reprocessing technologies such as electrochemical and molten salt technologies, and advanced redox extraction technologies;
- (H) advanced materials to be used in subparagraphs (A) through (G); and
- (I) other areas as determined by the Secretary.

(2) Requirements

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

- (A) ensure all activities and designs incorporate state of the art safeguards technologies and techniques to reduce risk of proliferation;
- (B) consult with the Administrator of the National Nuclear Security Administration to integrate safeguards and security by design;
- (C) consider the potential benefits and other impacts of those activities for civilian nuclear applications, environmental health and safety, and national security, including consideration of public consent; and
- (D) consider the economic viability of all activities and designs.

(3) Authorization of appropriations

There are authorized to be appropriated to the Secretary to carry out the program under this subsection \$60,000,000 for each of fiscal years 2021 through 2025.

(b) Advanced fuels

(1) In general

The Secretary shall conduct an advanced fuels research, development, demonstration, and commercial application program on next-generation light water reactor and advanced reactor fuels that demonstrate the potential for improved—

- (A) performance;
- (B) accident tolerance;
- (C) proliferation resistance;
- (D) use of resources;

- (E) environmental impact; and
- (F) economics.

(2) Requirements

In carrying out the program under this subsection, the Secretary shall focus on the development of advanced technology fuels, including fabrication techniques, that offer improved accident-tolerance and economic performance with the goal of initial commercial application by December 31, 2025.

(3) Report

Not later than 180 days December 27, 2020, the Secretary shall submit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate a report that describes how the technologies and concepts studied under this program would impact reactor economics, the fuel cycle, operations, safety, proliferation, and the environment.

(4) Authorization of appropriations

There are authorized to be appropriated to the Secretary to carry out the program under this subsection \$125,000,000 for each of fiscal years 2021 through 2025.

(Pub. L. 109–58, title IX, §953, Aug. 8, 2005, 119 Stat. 886; Pub. L. 115–248, §2(c), Sept. 28, 2018, 132 Stat. 3155; Pub. L. 116–260, div. Z, title II, §2003(b), Dec. 27, 2020, 134 Stat. 2462.)

Editorial Notes

AMENDMENTS

2020—Pub. L. 116–260 amended section generally. Prior to amendment, section related to advanced fuel cycle initiative.

2018—Subsec. (a). Pub. L. 115–248 struck out “, acting through the Director of the Office of Nuclear Energy, Science and Technology,” after “The Secretary”.

§ 16274. Nuclear science and engineering support

(a) University nuclear science and engineering support

(1) 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.

(2) Requirements

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

- (A) 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;
- (B) conduct a junior faculty research initiation grant program to assist universities in recruiting and retaining new faculty in the nuclear sciences and engineering by award-

ing grants to junior faculty for research on issues related to nuclear energy engineering and science;

(C) support fundamental nuclear sciences, engineering, and health physics research through a nuclear engineering education and research program;

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

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

(3) University-National Laboratory interactions

The Secretary shall conduct—

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

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

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

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

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

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

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

(D) reactor improvements that emphasize research, training, and education, including through the Innovations in Nuclear Infrastructure and Education Program or any similar program.

(5) Radiological facilities management

(A) In general

The Secretary shall carry out a program under which the Secretary shall provide project management, technical support, quality engineering and inspection, and nuclear material handling support to research reactors located at universities.

(B) Authorization of appropriations

Of any amounts appropriated to carry out the program under this subsection, there are authorized to be appropriated to the Secretary to carry out the program under this paragraph \$20,000,000 for each of fiscal years 2021 through 2025.

(6) Nuclear energy university program

In carrying out the programs under this section, the Department shall, to the maximum extent practicable, allocate 20 percent of funds appropriated to nuclear energy research and development programs annually, excluding funds appropriated for the Advanced Reactor

Demonstration Program of the Department, to fund university-led research and university infrastructure projects through an open, competitive solicitation process.

(7) Operations and maintenance

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

(8) Definition

In this subsection, 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 paragraph (2)(B).

(b) Nuclear energy graduate traineeship subprogram

(1) Establishment

In carrying out the program under subsection (a), the Secretary shall establish a nuclear energy graduate traineeship subprogram under which the Secretary shall competitively award graduate traineeships in coordination with universities to provide focused, advanced training to meet critical mission needs of the Department, including in industries that are represented by skilled labor unions.

(2) Requirements

In carrying out the subprogram under this subsection, the Secretary shall—

(A) encourage appropriate partnerships among National Laboratories, affected universities, and industry; and

(B) on an annual basis, evaluate the needs of the nuclear energy community to implement graduate traineeships for focused topical areas addressing mission-specific workforce needs.

(3) Authorization of appropriations

There are authorized to be appropriated to the Secretary to carry out the subprogram under this subsection \$5,000,000 for each of fiscal years 2021 through 2025.

(Pub. L. 109–58, title IX, §954, Aug. 8, 2005, 119 Stat. 886; Pub. L. 115–248, §2(d), Sept. 28, 2018, 132 Stat. 3155; Pub. L. 116–260, div. Z, title II, §2003(c), Dec. 27, 2020, 134 Stat. 2463; Pub. L. 117–58, div. D, title X, §41002(b)(2), Nov. 15, 2021, 135 Stat. 1128.)

Editorial Notes

AMENDMENTS

2021—Subsec. (a)(6). Pub. L. 117–58 inserted “, excluding funds appropriated for the Advanced Reactor Demonstration Program of the Department,” after “annually”.

2020—Pub. L. 116–260, §2003(c)(1), substituted “Nuclear” for “University nuclear” in section catchline.

Subsec. (a). Pub. L. 116–260, §2003(c)(10), designated existing provisions as subsec. (a) and inserted heading. Pub. L. 116–260, §2003(c)(9), added pars. (5) and (6).

Subsec. (b). Pub. L. 116–260, §2003(c)(11), added subsec. (b).

Pub. L. 116–260, §2003(c)(7), redesignated subsec. (b) as par. (2).

Pub. L. 116–260, §2003(c)(2), substituted “this subsection” for “this section” in introductory provisions, redesignated pars. (1) to (5) as subpars. (A) to (E), respectively, and realigned margins.

Subsec. (c). Pub. L. 116-260, §2003(c)(7), redesignated subsec. (c) as par. (3).

Pub. L. 116-260, §2003(c)(3), redesignated pars. (1) and (2) as subpars. (A) and (B), respectively, and realigned margins.

Subsec. (d). Pub. L. 116-260, §2003(c)(7), redesignated subsec. (d) as par. (4).

Pub. L. 116-260, §2003(c)(4), substituted “this subsection” for “this section” in introductory provisions, redesignated pars. (1) to (4) as subpars. (A) to (D), respectively, and realigned margins.

Subsec. (e). Pub. L. 116-260, §2003(c)(8), redesignated subsec. (e) as par. (7). Margins realigned to reflect the probable intent of Congress.

Pub. L. 116-260, §2003(c)(5), substituted “this subsection” for “this section”.

Subsec. (f). Pub. L. 116-260, §2003(c)(8), redesignated subsec. (f) as par. (8). Margins realigned to reflect the probable intent of Congress.

Pub. L. 116-260, §2003(c)(6), substituted “this subsection” for “this section” and “paragraph (2)(B)” for “subsection (b)(2)”.

2018—Subsec. (d)(4). Pub. L. 115-248 substituted “that emphasize” for “as part of a taking into consideration effort that emphasizes”.

Statutory Notes and Related Subsidiaries

WAGE RATE REQUIREMENTS

For provisions relating to rates of wages to be paid to laborers and mechanics on projects for construction, alteration, or repair work funded under div. D or an amendment by div. D of Pub. L. 117-58, including authority of Secretary of Labor, see section 18851 of this title.

§ 16274a. University Nuclear Leadership Program

(a) In general

The Secretary of Energy, the Administrator of the National Nuclear Security Administration, and the Chairman of the Nuclear Regulatory Commission shall jointly establish a program, to be known as the “University Nuclear Leadership Program”.

(b) Use of funds

(1) In general

Except as provided in paragraph (2), amounts made available to carry out the Program shall be used to provide financial assistance for scholarships, fellowships, and research and development projects at institutions of higher education in areas relevant to the programmatic mission of the applicable Federal agency, with an emphasis on providing the financial assistance with respect to research, development, demonstration, and commercial application activities relevant to civilian advanced nuclear reactors including, but not limited to—

- (A) relevant fuel cycle technologies;
- (B) project management; and
- (C) advanced construction, manufacturing, and fabrication methods.

(2) Exception

Notwithstanding paragraph (1), amounts made available to carry out the Program may be used to provide financial assistance for a scholarship, fellowship, or multiyear research and development project that does not align directly with a programmatic mission of the Department of Energy, if the activity for which assistance is provided would facilitate

the maintenance of the discipline of nuclear science or engineering.

(c) Definitions

In this section:

(1) Advanced nuclear reactor; institution of higher education

The terms “advanced nuclear reactor” and “institution of higher education” have the meanings given those terms in section 16271 of this title.

(2) Program

The term “Program” means the University Nuclear Leadership Program established under this section.

(d) Authorization of appropriations

There are authorized to be appropriated to carry out the Program for each of fiscal years 2021 through 2025—

(1) \$30,000,000 to the Secretary of Energy, of which \$15,000,000 shall be for use by the Administrator of the National Nuclear Security Administration; and

(2) \$15,000,000 to the Nuclear Regulatory Commission.

(Pub. L. 111-8, div. C, title III, §313, Mar. 11, 2009, 123 Stat. 627; Pub. L. 116-260, div. Z, title II, §2003(e), Dec. 27, 2020, 134 Stat. 2465.)

Editorial Notes

CODIFICATION

Section was enacted as part of the Energy and Water Development and Related Agencies Appropriations Act, 2009, and also as part of the Omnibus Appropriations Act, 2009, and not as part of the Energy Policy Act of 2005 which comprises this chapter.

AMENDMENTS

2020—Pub. L. 116-260 amended section generally. Prior to amendment, section related to Integrated University Program.

§ 16275. Department of Energy civilian nuclear infrastructure and facilities

(a) In general

The Secretary shall operate and maintain infrastructure and facilities to support the nuclear energy research, development, demonstration, and commercial application programs, including radiological facilities management, isotope production, and facilities management.

(b) Duties

In carrying out this section, the Secretary shall—

(1) develop an inventory of nuclear science and engineering facilities, equipment, expertise, and other assets at all of the National Laboratories;

(2) develop a prioritized list of nuclear science and engineering plant and equipment improvements needed at each of the National Laboratories;

(3) consider the available facilities and expertise at all National Laboratories and emphasize investments which complement rather than duplicate capabilities; and

(4) develop a timeline and a proposed budget for the completion of deferred maintenance on