

University Reactor Infrastructure and Education Assistance

Funding Profile by Subprogram

(dollars in thousands)

	FY 2006 Current Appropriation	FY 2007 Request	FY 2008 Request
University Reactor Infrastructure and Education Assistance	26,730	0	0

Public Law Authorizations:

P.L. 109-103, Energy and Water Development Appropriations Act, 2006

P.L. 109-148, Emergency Supplemental Appropriations to Address Hurricanes in the Gulf of Mexico and Pandemic Influenza, 2006

Mission

The mission of the University Reactor Infrastructure and Education Assistance program has been to enhance the national nuclear educational infrastructure to meet the manpower requirements of the Nation's energy, environmental, health care, and national security sectors. Enrollment target levels of the University Reactor Infrastructure and Education Assistance program have been met and the program is no longer considered essential to encourage students to enter into nuclear related disciplines.

Benefits

The United States (U.S.) has led the world in the development and application of nuclear technology for many decades. This leadership, which spans energy, national security, environmental, medical, and other applications, has been possible because the Government has helped foster advanced nuclear technology education at many universities and colleges across the Nation. The Government has succeeded in helping these programs to maintain the educational and training infrastructure necessary to develop the next generation of nuclear scientists and engineers. During the 1980s and 1990s, the number of students entering nuclear engineering programs in the U.S. declined causing a corresponding decline in nuclear engineering programs and research reactors. As the decline continued, the existing expertise in the nuclear field was reaching retirement age. Thus, the demand for nuclear scientists and engineers exceeded supply. The University Reactor Infrastructure and Education Assistance program was designed to address these issues by providing support to university nuclear engineering programs and the university research reactor community.

Beginning in FY 2007, funding to continue Federal support for fuel for universities is requested in the Radiological Facilities Management budget under Research Reactor Infrastructure.

Strategic and GPRA Unit Program Goals

The Department's Strategic Plan identifies five Strategic Themes (one each for energy security, nuclear security, scientific discovery, environmental responsibility and management excellence), plus 16

Strategic Goals that tie to the Strategic Themes. The University Reactor Infrastructure and Education Assistance program supported the following goals:

Strategic Theme 1, Energy Security

Strategic Goal 1.2, Environmental Impacts of Energy: Improve the quality of the environment by reducing greenhouse gas emissions and environmental impacts to land, water, and air from energy production and use.

The University Reactor Infrastructure and Education Assistance program has one GPRA Unit Program goal which contributed to Strategic Goals 1.2 in the “goal cascade”:

GPRA Unit Program Goal 1.2.15.00: Maintain and Enhance National Nuclear Infrastructure - Maintain, enhance, and safeguard the Nation’s nuclear infrastructure capability to meet the Nation’s energy, medical research, space exploration, and national security needs.

Contribution to GPRA Unit Program Goal 1.2.15.00 (Maintain and Enhance National Nuclear Infrastructure)

The University Reactor Infrastructure and Education Assistance Program was designed to address declining enrollment levels among U.S. nuclear engineering programs. Since the late 1990s, enrollment levels in nuclear education programs have tripled. In fact, enrollment levels for 2005 have reached upwards of 1,500 students, the program’s target level for the year 2015. In addition, the number of universities offering nuclear-related programs also has increased. These trends reflect renewed interest in nuclear power. Students will continue to be drawn into this course of study, and universities, along with nuclear industry societies and utilities, will continue to invest in university research reactors, students, and faculty members. Consequently, Federal assistance is no longer necessary, and the 2007 Budget proposed termination of the University Reactor Infrastructure and Education Assistance Program. The termination is also supported by the fact that the program was unable to demonstrate results from its activities when reviewed using the Program Assessment Rating Tool (PART), supporting the decision to spend taxpayer dollars on other priorities.

Funding by Strategic and GPRA Unit Program Goal

(dollars in thousands)

	FY 2006	FY 2007	FY 2008
Strategic Goal 1.2, Environmental Impacts of Energy			
GPRA Unit Program Goal 1.2.15.00, Maintain and Enhance National Nuclear Infrastructure			
University Reactor Infrastructure and Education Assistance	26,730	0	0
Total, Strategic Goal 1.2 (University Reactor Infrastructure and Education Assistance)	26,730	0	0

Annual Performance Results and Targets

FY 2003 Results	FY 2004 Results	FY 2005 Results	FY 2006 Results	FY 2007 Targets	FY 2008 Targets
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GPRA Unit Program Goal 1.2.15.00 (Maintain and Enhance National Nuclear Infrastructure)

University Reactor Infrastructure and Education Assistance

Protect national nuclear research assets by funding 4 regional reactor centers; providing fuel to University Research Reactors; funding 20 to 25 DOE/Industry Matching Grants, 18 equipment and instrumentation upgrades, and 37 Nuclear Engineering Education Research grants; and providing 18 fellowships and 40 scholarships. (MET TARGET)

Fund the six existing regional reactor centers; provide fuel to University Research Reactors; fund 20 to 25 DOE/Industry Matching Grants, 20 equipment and instrumentation upgrades, and 50 Nuclear Engineering Education Research grants; and provide 18 fellowships and 47 scholarships. (MET TARGET)

Issue funding to the six existing Innovations in Nuclear Infrastructure and Education consortia; provide fuel to University Research Reactors; issue funding to 20 to 25 DOE/Industry Matching Grants, 20 equipment and instrumentation upgrades, and 50 Nuclear Engineering Education Research grants; and provide 25 fellowships and 75 scholarships. (MET TARGET)

Complete activities to enhance the nation's nuclear education infrastructure by providing financial support to universities for facility and reactor modernization and to students to enable the pursuit of careers in nuclear energy-related fields; through these activities, DOE is demonstrating its commitment to the development of nuclear technology for the Nation. (MET TARGET)

Enrollment target levels of the University Reactor Infrastructure and Education Assistance program have already been met and the program is no longer needed to encourage students to enter into nuclear related disciplines.

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Means and Strategies

The University Reactor Infrastructure and Education Assistance program used various means and strategies to achieve its program goals. The program also performed collaborative activities to help meet its goals.

The Department implemented the following means:

- Used educational incentives, including fellowships, scholarships, research funding, faculty support and private sector funding support from our Matching Grant program, which was aimed at increasing enrollments and graduates in nuclear engineering.
- Pursued programs that were geared towards increasing minority participation and support by pairing nuclear engineering schools with minority institutions enabling students from minority universities to achieve degrees in both nuclear engineering and their chosen technical field.

The Department implemented the following strategies:

- Worked to develop a pipeline of qualified and interested students in the area of nuclear science by training and educating middle and high school science teachers through the funding of the American Nuclear Society (ANS) Workshops.
- Improved the tools available to present and future students by upgrading university reactors and enabling others to share reactor time creating a stronger infrastructure by improving reactor operations and broadening the reach of the reactor facilities to those who would not otherwise have access to such sophisticated facilities.
- Met periodically throughout the year with stakeholder organizations such as the Nuclear Engineering Department Heads Organization (NEDHO); the University Working Group; the Test, Research, and Training Reactor Management Group (TRTR); and other committees of professional organizations such as the American Nuclear Society to review program activities; discuss program issues; and solicit input, advice, and guidance.

Validation and Verification

All peer-reviewed university activities grantees are required to submit annual reports to DOE outlining the progress achieved. Once annual reports are submitted, they are logged in the NE database and reviewed by the NE Program Manager for compliance with the Program's stated goals and objectives. Nuclear Engineering Education Research (NEER) annual and final reports are posted to the NEER web page at <http://neer.inel.gov/>. These annual reports provide an opportunity to verify and validate performance. Also, quarterly, semi-annual, and annual reviews of financial reports consistent with program plans are held to ensure technical progress, cost and schedule adherence, and responsiveness to program requirements.

Program evaluations of Innovations in Nuclear Infrastructure and Education (INIE) grant activities are typically conducted twice a year. In addition, comprehensive reviews are held with each INIE consortium to go over performance and cost. Each consortium member has an opportunity to provide progress information and input into upcoming performance. Further, INIE awardees are required to submit annual progress reports to NE on activities conducted during the year. The report was revised in

FY 2005 to make the report more standardized. They are logged in the NE database and reviewed by the NE Program Manager for compliance with program goals.

NE conducts annual reviews of existing fellowship and scholarship recipients prior to renewing any awards.

All three-year radiochemistry grants are reviewed annually through site visits by the program manager.

Program Assessment Rating Tool (PART)

The Department has implemented a tool to evaluate selected programs. PART was developed by OMB to provide a standardized way to assess the effectiveness of the Federal Government's portfolio of programs. The structured framework of the PART provides a means through which programs can assess their activities differently than through traditional reviews.

A PART was completed for the University Reactor Infrastructure and Education Assistance program during the FY 2007 budget formulation cycle. The assessment determined that enrollment target levels of the program have already been met and that students no longer need to be encouraged to enter into nuclear related disciplines. In addition, the number of universities offering nuclear-related programs also has increased. These trends reflect renewed interest in nuclear power. Students will continue to be drawn into this course of study and universities, along with nuclear industry societies and utilities, will continue to invest in university research reactors, students, and faculty members. Consequently, Federal assistance is no longer necessary, and the 2007 Budget proposed termination of this program. This termination was also supported by the fact that the program lacks adequate performance measures and was unable to demonstrate results from its activities when reviewed using the PART. The 2008 Budget includes \$2.9 million to provide fresh reactor fuel to universities and to dispose of spent fuel from university reactors under Research Reactor Infrastructure, within Radiological Facilities Management.

Funding Schedule by Activity

(dollars in thousands)

	FY 2006	FY 2007	FY 2008
University Reactor Infrastructure and Education Assistance			
University Nuclear Infrastructure	14,100	0 ^a	0 ^b
DOE/Industry Matching Grants Program	1,000	0	0
Fellowships/Scholarships to Nuclear Science and Engineering Programs at Universities	2,350	0	0
Health Physics Fellowships & Scholarships	300	0	0
Nuclear Engineering Education Research (NEER) Grants	5,000	0	0
Nuclear Engineering Education Opportunities	600	0	0
Radiochemistry Awards	650	0	0
University Nuclear Education Infrastructure and Assistance	2,730	0	0
Total, University Reactor Infrastructure and Education Assistance	26,730	0	0

Detailed Justification

(dollars in thousands)

	FY 2006	FY 2007	FY 2008
University Nuclear Infrastructure	14,100	0^a	0^a

The UNI program provided fuel for the universities; instrumentation, electronics, hardware, and software upgrades for the research reactors; and reactor sharing and research support for educational institutions to facilitate the development of the Nation's next generation of nuclear scientists and engineers.

In FY 2006, the program awarded 20 grants permitting universities without research reactors to have access to reactors for training, educational, and research purposes.

In FY 2006, the program supported 19 universities to address maintenance and upgrades to equipment required at university research reactors; provided new equipment to replace antiquated equipment; maintained reactor systems; and upgraded experimental capabilities.

In FY 2006, Innovations in Nuclear Infrastructure and Education (INIE) grant initiative encompassed 38 universities aligned in six regional INIE consortia. The INIE grants assist universities in continuing the integration of academics and reactor research, which enhances the quality of student education, and encourages universities to better work with the Department's national laboratories, private industry and

^a \$2,947,000 for fuel is requested in the Radiological Facilities Management Budget under Research Reactor Infrastructure.

(dollars in thousands)

FY 2006	FY 2007	FY 2008
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other universities. Promoting this collaborative effort expands the use of university facilities for research, education, and training of nuclear engineers and scientists by establishing regional research and training centers and strategic partnerships.

No funding is requested for these activities in FY 2007 or FY 2008. Funding to provide fresh reactor fuel for universities is requested in the Radiological Facilities Management budget under Research Reactor Infrastructure.

DOE/Industry Matching Grants Program	1,000	0	0
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In FY 2006, the DOE/Industry Matching Grants program awarded grants to 24 universities for education, training, and innovative research. This program provided grants up to \$60,000 that were matched by industry.

No funding is requested for this activity in FY 2007 or FY 2008.

Fellowships/Scholarships to Nuclear Science and Engineering Programs at Universities	2,350	0	0
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In FY 2006, a total of 21 fellowships and 76 scholarships were awarded to students enrolled in nuclear science and engineering at U.S. universities. Fellowships are provided to M.S. and Ph.D. students and scholarships to undergraduate students.

The University Partnership program encouraged students enrolled at minority-serving institutions to pursue a nuclear engineering degree in cooperation with universities that grant those degrees. In FY 2006, the Department funded eight university partnerships.

No funding is requested for this activity in FY 2007 or FY 2008.

Health Physics Fellowships & Scholarships	300	0	0
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In FY 2006, three fellowships were provided to graduate students enrolled in Health Physics programs at U.S. universities.

No funding is requested for this activity in FY 2007 or FY 2008.

Nuclear Engineering Education Research (NEER) Grants	5,000	0	0
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In FY 2006, awards were made under existing grants, but no new NEER grants were awarded. The NEER program provided grants allowing nuclear engineering faculty and students to conduct innovative research in nuclear engineering and related areas. No funding is requested for this activity in FY 2007 or FY 2008.

(dollars in thousands)

FY 2006	FY 2007	FY 2008
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Nuclear Engineering Education Opportunities

600 0 0

The teacher workshops program was conducted in conjunction with the American Nuclear Society, which used qualified volunteers from its membership to train teachers and students, keeping costs down. In FY 2006, the teacher workshops reached over five hundred teachers enabling them to teach nuclear science and engineering principles to their students.

In FY 2006, the program applied the model used in the Pittsburgh pilot to other programs across the country on a cost-share basis with regional sponsors.

No funding is requested for this activity in FY 2007 or FY 2008.

Radiochemistry Awards

650 0 0

The Department provided grants every three years to support faculty and graduate/post doctorate students in radiochemistry. In FY 2006, the program continued to fund three existing radiochemistry grants and began a new one.

No funding is requested for this activity in FY 2007 or FY 2008.

University Nuclear Education Infrastructure and Assistance

2,730 0 0

The Department provided funding to support collaboration of the Institute of Nuclear Science and Engineering at Idaho National Laboratories with local universities and colleges.

No funding is requested for this activity in FY 2007 or FY 2008.

Total, University Reactor Infrastructure and Education Assistance

26,730 0 0