

108TH CONGRESS  
2D SESSION

# H. R. 3828

To authorize funding for University Nuclear Science, Engineering, and Health Physics Programs at the Department of Energy for fiscal years 2005 through 2008.

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## IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 25, 2004

Mrs. BIGGERT introduced the following bill; which was referred to the Committee on Science

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## A BILL

To authorize funding for University Nuclear Science, Engineering, and Health Physics Programs at the Department of Energy for fiscal years 2005 through 2008.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Department of Energy  
5 University Nuclear Science, Engineering, and Health  
6 Physics Act”.

7 **SEC. 2. FINDINGS.**

8 The Congress finds the following:

1           (1) United States university nuclear science, en-  
2           gineering, and health programs are in a state of se-  
3           rious decline. The supply of bachelor degree nuclear  
4           science, engineering, and health physics personnel in  
5           the United States is lower than the number of jobs  
6           available, resulting in a shortage of these critical  
7           professionals. The number of 4-year degree nuclear  
8           engineering programs has declined 50 percent to ap-  
9           proximately 25 programs nationwide. Over  $\frac{2}{3}$  of the  
10          faculty in these programs are 45 years or older and  
11          there are few tenure track junior faculty positions  
12          available.

13          (2) Universities are finding it increasingly dif-  
14          ficult to fund the operational costs of their research  
15          and training reactors. Since 1980, the number of  
16          small training reactors in the United States has de-  
17          clined by over 50 percent to 27 reactors. Most of  
18          these reactors were built in the late 1950's and  
19          1960's with 30- to 40-year operating licenses, and  
20          will require relicensing in the next several years.

21          (3) The neglect in human investment and train-  
22          ing infrastructure is affecting 50 years of national  
23          research and development investment. The decline in  
24          a competent nuclear workforce, and the lack of ade-  
25          quately trained nuclear scientists, engineers, and

1 health physicists, will affect the ability of the United  
2 States to solve future waste storage issues, operate  
3 existing and design future fission reactors in the  
4 United States, respond to future nuclear events  
5 worldwide, help stem the proliferation of nuclear  
6 weapons, and design and operate naval nuclear reac-  
7 tors.

8 (4) Future neglect in the Nation's investment  
9 in human resources for the nuclear sciences will lead  
10 to a downward spiral. As the number of nuclear  
11 science departments shrinks, faculties age, and  
12 training reactors close, the appeal of nuclear science  
13 will be lost to future generations of students.

14 (5) Current projections are that 50 percent of  
15 industry's nuclear workforce can retire in 10 to 15  
16 years, and 76 percent of the nuclear workforce at  
17 our national labs can retire in the next 5 years. A  
18 new supply of trained scientists and engineers to re-  
19 place this retiring workforce is urgently needed.

20 (6) The Department of Energy's Office of Nu-  
21 clear Energy, Science, and Technology is well suited  
22 to help maintain tomorrow's human resource and  
23 training investment in the nuclear sciences. Through  
24 its support of research and development pursuant to  
25 the Department's statutory authorities, the Office of

1 Nuclear Energy, Science, and Technology is the  
2 principal Federal agent for civilian research in the  
3 nuclear sciences for the United States. The Office  
4 maintains the Nuclear Engineering and Education  
5 Research Program which funds basic nuclear science  
6 and engineering. The Office funds the Nuclear En-  
7 ergy and Research Initiative which funds applied  
8 collaborative research among universities, industry,  
9 and national laboratories in the areas of prolifera-  
10 tion-resistant fuel cycles and future fission power  
11 systems. The Office funds universities to refuel  
12 training reactors from highly enriched to low-en-  
13 riched proliferation-tolerant fuels, performs instru-  
14 mentation upgrades, and maintains a program of  
15 student fellowships for nuclear science, engineering,  
16 and health physics.

17 **SEC. 3. DEPARTMENT OF ENERGY PROGRAM.**

18 (a) ESTABLISHMENT.—The Secretary of Energy,  
19 through the Office of Nuclear Energy, Science, and Tech-  
20 nology, shall support a program to invest in human re-  
21 sources and infrastructure in the nuclear sciences, engi-  
22 neering, and health physics fields, consistent with the De-  
23 partment’s statutory authorities related to civilian nuclear  
24 research and development.

1 (b) DUTIES.—In carrying out the program under this  
2 Act, the Secretary shall—

3 (1) establish a graduate and undergraduate fel-  
4 lowship program to attract new and talented stu-  
5 dents;

6 (2) establish a Junior Faculty Research Initi-  
7 ation Grant Program to assist institutions of higher  
8 education in recruiting and retaining new faculty in  
9 the nuclear sciences, engineering, and health physics;

10 (3) support fundamental nuclear sciences, engi-  
11 neering, and health physics research through the  
12 Nuclear Engineering Education Research Program;

13 (4) encourage collaborative nuclear research  
14 and training among industry, National Laboratories,  
15 and institutions of higher education; and

16 (5) support communication and outreach re-  
17 lated to nuclear science, engineering, and health  
18 physics.

19 (c) STRENGTHENING UNIVERSITY RESEARCH AND  
20 TRAINING REACTORS AND ASSOCIATED INFRASTRUC-  
21 TURE.—Activities under this section may include—

22 (1) converting research reactors currently using  
23 high-enrichment fuels to low-enrichment fuels, up-  
24 grading operational instrumentation, and sharing of  
25 reactors among institutions of higher education;

1           (2) providing technical assistance, in collabora-  
2           tion with the United States nuclear industry, in reli-  
3           censing and upgrading training reactors as part of  
4           a student training program; and

5           (3) providing funding, through the Innovations  
6           in Nuclear Infrastructure and Education Program,  
7           for reactor improvements as part of a focused effort  
8           that emphasizes research, training, and education.

9           (d)    UNIVERSITY-DOE    LABORATORY    INTER-  
10          ACTIONS.—The Secretary of Energy, through the Office  
11          of Nuclear Energy, Science, and Technology, shall de-  
12          velop—

13           (1) a sabbatical fellowship program for profes-  
14           sors at institutions of higher education to spend ex-  
15           tended periods of time at Department of Energy lab-  
16           oratories in the areas of nuclear science and tech-  
17           nology; and

18           (2) a visiting scientist program in which Na-  
19           tional Laboratory staff can spend time in academic  
20           nuclear science, engineering, and health physics de-  
21           partments.

22          The Secretary may under subsection (b)(1) provide fellow-  
23          ships for students to spend time at National Laboratories  
24          in the areas of nuclear science, engineering, and health

1 physics with a member of the Laboratory staff acting as  
2 a mentor.

3 (e) OPERATIONS AND MAINTENANCE.—Funding for  
4 a research project provided under this section may be used  
5 to offset a portion of the operating and maintenance costs  
6 of a research reactor at an institution of higher education  
7 used in the research project.

8 (f) MERIT REVIEW REQUIRED.—All grants, con-  
9 tracts, cooperative agreements, or other financial assist-  
10 ance awards under this Act shall be made only after inde-  
11 pendent merit review.

12 **SEC. 4. AUTHORIZATION OF APPROPRIATIONS.**

13 (a) TOTAL AUTHORIZATION.—The following sums  
14 are authorized to be appropriated to the Secretary of En-  
15 ergy, to remain available until expended, for the purposes  
16 of carrying out this Act:

17 (1) \$35,200,000 for fiscal year 2005.

18 (2) \$44,350,000 for fiscal year 2006.

19 (3) \$49,200,000 for fiscal year 2007.

20 (4) \$54,950,000 for fiscal year 2008.

21 (b) GRADUATE AND UNDERGRADUATE FELLOW-  
22 SHIPS.—Of the funds authorized under subsection (a), the  
23 following sums are authorized to be appropriated to carry  
24 out section 3(b)(1):

25 (1) \$3,000,000 for fiscal year 2005.

1           (2) \$3,100,000 for fiscal year 2006.

2           (3) \$3,200,000 for fiscal year 2007.

3           (4) \$3,200,000 for fiscal year 2008.

4           (c) JUNIOR FACULTY RESEARCH INITIATION GRANT  
5 PROGRAM.—Of the funds authorized under subsection (a),  
6 the following sums are authorized to be appropriated to  
7 carry out section 3(b)(2):

8           (1) \$2,275,000 for fiscal year 2005.

9           (2) \$3,675,000 for fiscal year 2006.

10          (3) \$4,150,000 for fiscal year 2007.

11          (4) \$5,150,000 for fiscal year 2008.

12          (d) NUCLEAR ENGINEERING EDUCATION RESEARCH  
13 AND NUCLEAR HEALTH PHYSICS.—Of the funds author-  
14 ized under subsection (a), the following sums are author-  
15 ized to be appropriated to carry out section 3(b)(3):

16          (1) \$11,000,000 for fiscal year 2005, of which  
17 \$3,000,000 shall be for the nuclear health physics.

18          (2) \$15,600,000 for fiscal year 2006, of which  
19 \$3,600,000 shall be for the nuclear health physics.

20          (3) \$17,000,000 for fiscal year 2007, of which  
21 \$4,000,000 shall be for the nuclear health physics.

22          (4) \$19,000,000 for fiscal year 2008, of which  
23 \$4,500,000 shall be for the nuclear health physics.

24          (e) COMMUNICATION AND OUTREACH RELATED TO  
25 NUCLEAR SCIENCE, ENGINEERING, AND HEALTH PHYS-



1 ICS.—Of the funds authorized under subsection (a), the  
2 following sums are authorized to be appropriated to carry  
3 out section 3(b)(5):

4 (1) \$500,000 for fiscal year 2005.

5 (2) \$550,000 for fiscal year 2006.

6 (3) \$600,000 for fiscal year 2007.

7 (4) \$650,000 for fiscal year 2008.

8 (f) REFUELING OF RESEARCH REACTORS AND IN-  
9 STRUMENTATION UPGRADES.—Of the funds authorized  
10 under subsection (a), the following sums are authorized  
11 to be appropriated to carry out section 3(c)(1):

12 (1) \$6,000,000 for fiscal year 2005.

13 (2) \$6,500,000 for fiscal year 2006.

14 (3) \$7,000,000 for fiscal year 2007.

15 (4) \$7,500,000 for fiscal year 2008.

16 (g) RELICENSING ASSISTANCE.—Of the funds au-  
17 thorized under subsection (a), the following sums are au-  
18 thorized to be appropriated to carry out section 3(c)(2):

19 (1) \$700,000 for fiscal year 2005.

20 (2) \$1,100,000 for fiscal year 2006.

21 (3) \$1,200,000 for fiscal year 2007.

22 (4) \$1,300,000 for fiscal year 2008.

23 (h) INNOVATIONS IN NUCLEAR INFRASTRUCTURE  
24 AND EDUCATION PROGRAM.—Of the funds authorized

1 under subsection (a), the following sums are authorized  
2 to be appropriated to carry out section 3(c)(3):

3 (1) \$10,000,000 for fiscal year 2005.

4 (2) \$12,000,000 for fiscal year 2006.

5 (3) \$14,000,000 for fiscal year 2007.

6 (4) \$15,000,000 for fiscal year 2008.

7 (i) UNIVERSITY-DOE LABORATORY INTER-  
8 ACTIONS.—Of the funds authorized under subsection (a),  
9 the following sums are authorized to be appropriated to  
10 carry out section 3(d):

11 (1) \$1,725,000 for fiscal year 2005.

12 (2) \$1,825,000 for fiscal year 2006.

13 (3) \$2,050,000 for fiscal year 2007.

14 (4) \$3,150,000 for fiscal year 2008.

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