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(Original Signature of Member)

115TH CONGRESS  
1ST SESSION

**H. R. 4377**

To direct the Secretary of Energy to carry out an upgrade to research equipment and construct research user facilities, and for other purposes.

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IN THE HOUSE OF REPRESENTATIVES

Mr. HULTGREN introduced the following bill; which was referred to the Committee on \_\_\_\_\_

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**A BILL**

To direct the Secretary of Energy to carry out an upgrade to research equipment and construct research user facilities, and for other purposes.

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 “Accelerating American  
5 Leadership in Science Act of 2017”.

6 **SEC. 2. ADVANCED PHOTON SOURCE UPGRADE.**

7 (a) IN GENERAL.—The Secretary of Energy shall  
8 provide for the upgrade to the Advanced Photon Source

1 described in the publication approved by the Basic Energy  
2 Sciences Advisory Committee on June 9, 2016, titled “Re-  
3 port on Facility Upgrades”, including the development of  
4 a multi-bend achromat lattice to produce a high flux of  
5 coherent x-rays within the hard x-ray energy region and  
6 a suite of beamlines optimized for this source.

7 (b) DEFINITIONS.—In this section:

8 (1) FLUX.—The term “flux” means the rate of  
9 flow of photons.

10 (2) HARD X-RAY.—The term “hard x-ray”  
11 means a photon with energy greater than 20  
12 kiloelectron volts.

13 (c) START OF OPERATIONS.—The Secretary shall, to  
14 the maximum extent practicable, ensure that the start of  
15 full operations of the upgrade under this section occurs  
16 before December 31, 2025.

17 (d) FUNDING.—Out of funds appropriated to the Of-  
18 fice of Science, there shall be made available to the Sec-  
19 retary to carry out the upgrade under this section—

20 (1) \$93,000,000 for fiscal year 2018;

21 (2) \$130,000,000 for fiscal year 2019;

22 (3) \$152,400,000 for fiscal year 2020;

23 (4) \$150,000,000 for fiscal year 2021;

24 (5) \$73,600,000 for fiscal year 2022; and

25 (6) \$20,000,000 for fiscal year 2023.

1 **SEC. 3. LONG-BASELINE NEUTRINO FACILITY FOR DEEP**  
2 **UNDERGROUND NEUTRINO EXPERIMENT.**

3 (a) **IN GENERAL.**—The Secretary of Energy shall  
4 provide for a Long-Baseline Neutrino Facility to facilitate  
5 the international Deep Underground Neutrino Experiment  
6 to enable a program in neutrino physics to measure the  
7 fundamental properties of neutrinos, explore physics be-  
8 yond the Standard Model, and better clarify the nature  
9 of matter and antimatter.

10 (b) **FACILITY CAPABILITIES.**—The Secretary shall  
11 ensure that the facility described in subsection (a) will pro-  
12 vide, at a minimum, the following capabilities:

13 (1) A broad-band neutrino beam capable of 1.2  
14 megawatts (MW) of beam power and upgradable to  
15 2.4 MW of beam power.

16 (2) Four caverns excavated for a forty kiloton  
17 fiducial detector mass and supporting surface build-  
18 ings and utilities.

19 (3) Neutrino detector facilities at both the Far  
20 Site in South Dakota and the Near Site in Illinois  
21 to categorize and study neutrinos on their 800-mile  
22 journey between the two sites.

23 (4) Cryogenic systems to support neutrino de-  
24 tectors.

25 (c) **START OF OPERATIONS.**—The Secretary shall, to  
26 the maximum extent practicable, ensure that the start of

1 full operations of the facility under this section occurs be-  
2 fore December 31, 2026.

3 (d) FUNDING.—Out of funds appropriated to the Of-  
4 fice of Science, there shall be made available to the Sec-  
5 retary to carry out activities, including construction of the  
6 facility, under this section—

7 (1) \$95,000,000 for fiscal year 2018;

8 (2) \$160,000,000 for fiscal year 2019;

9 (3) \$195,000,000 for fiscal year 2020;

10 (4) \$195,000,000 for fiscal year 2021;

11 (5) \$200,000,000 for fiscal year 2022;

12 (6) \$200,000,000 for fiscal year 2023;

13 (7) \$195,000,000 for fiscal year 2024;

14 (8) \$150,000,000 for fiscal year 2025; and

15 (9) \$50,000,000 for fiscal year 2026.

16 **SEC. 4. SPALLATION NEUTRON SOURCE PROTON POWER**

17 **UPGRADE.**

18 (a) IN GENERAL.—The Secretary of Energy shall  
19 provide for a proton power upgrade to the Spallation Neu-  
20 tron Source.

21 (b) DEFINITION OF PROTON POWER UPGRADE.—

22 For the purposes of this section, the term “proton power  
23 upgrade” means the Spallation Neutron Source power up-  
24 grade described in—

1 (1) the publication of the Office of Science of  
2 the Department of Energy titled “Facilities for the  
3 Future of Science: A Twenty-year Outlook”, pub-  
4 lished December 2003;

5 (2) the publication of the Office of Science of  
6 the Department of Energy titled “Four Years Later:  
7 An Interim Report on Facilities for the Future of  
8 Science: A Twenty-Year Outlook”, published August  
9 2007; and

10 (3) the publication approved by the Basic En-  
11 ergy Sciences Advisory Committee on June 9, 2016,  
12 titled “Report on Facility Upgrades”.

13 (c) START OF OPERATIONS.—The Secretary shall, to  
14 the maximum extent practicable, ensure that the start of  
15 full operations of the upgrade under this section occurs  
16 before December 31, 2025.

17 (d) FUNDING.—Out of funds appropriated to the Of-  
18 fice of Science, there shall be made available to the Sec-  
19 retary to carry out the upgrade under this section—

20 (1) \$26,000,000 for fiscal year 2018;

21 (2) \$70,800,000 for fiscal year 2019;

22 (3) \$33,500,000 for fiscal year 2020;

23 (4) \$40,500,000 for fiscal year 2021;

24 (5) \$21,100,000 for fiscal year 2022;

25 (6) \$13,200,000 for fiscal year 2023; and

1 (7) \$2,900,000 for fiscal year 2024.

2 **SEC. 5. SPALLATION NEUTRON SOURCE SECOND TARGET**  
3 **STATION.**

4 (a) IN GENERAL.—The Secretary of Energy shall  
5 provide for a second target station for the Spallation Neu-  
6 tron Source.

7 (b) DEFINITION OF SECOND TARGET STATION.—For  
8 the purposes of this section, the term “second target sta-  
9 tion” means the Spallation Neutron Source second target  
10 station described in—

11 (1) the publication of the Office of Science of  
12 the Department of Energy titled “Facilities for the  
13 Future of Science: A Twenty-year Outlook”, pub-  
14 lished December 2003;

15 (2) the publication of the Office of Science of  
16 the Department of Energy titled “Four Years Later:  
17 An Interim Report on Facilities for the Future of  
18 Science: A Twenty-Year Outlook”, published August  
19 2007; and

20 (3) the publication approved by the Basic En-  
21 ergy Sciences Advisory Committee on June 9, 2016,  
22 titled “Report on Facility Upgrades”.

23 (c) START OF OPERATIONS.—The Secretary shall, to  
24 the maximum extent practicable, ensure that the start of  
25 full operations of the second target station under this sec-

1 tion occurs before December 31, 2030, with the option for  
2 early operation in 2028.

3 (d) FUNDING.—Out of funds appropriated to the Of-  
4 fice of Science, there shall be made available to the Sec-  
5 retary to carry out activities, including construction, under  
6 this section—

- 7 (1) \$5,000,000 for fiscal year 2018;
- 8 (2) \$10,000,000 for fiscal year 2019;
- 9 (3) \$15,000,000 for fiscal year 2020;
- 10 (4) \$25,000,000 for fiscal year 2021;
- 11 (5) \$50,000,000 for fiscal year 2022;
- 12 (6) \$200,000,000 for fiscal year 2023;
- 13 (7) \$275,000,000 for fiscal year 2024;
- 14 (8) \$275,000,000 for fiscal year 2025;
- 15 (9) \$275,000,000 for fiscal year 2026;
- 16 (10) \$250,000,000 for fiscal year 2027; and
- 17 (11) \$120,000,000 for fiscal year 2028.