

AMENDMENT NO. _____ Calendar No. _____

Purpose: In the nature of a substitute.

IN THE SENATE OF THE UNITED STATES—116th Cong., 1st Sess.

S. 2368

To amend the Atomic Energy Act of 1954 and the Energy Policy Act of 2005 to support licensing and relicensing of certain nuclear facilities and nuclear energy research, demonstration, and development, and for other purposes.

Referred to the Committee on _____ and
ordered to be printed

Ordered to lie on the table and to be printed

AMENDMENT IN THE NATURE OF A SUBSTITUTE intended
to be proposed by _____

Viz:

1 Strike all after the enacting clause and insert the fol-
2 lowing:

3 **SECTION 1. SHORT TITLE.**

4 This Act may be cited as the “Nuclear Energy Re-
5 newal Act of 2019”.

6 **SEC. 2. LIGHT WATER REACTOR SUSTAINABILITY PRO-**
7 **GRAM.**

8 Section 952 of the Energy Policy Act of 2005 (42
9 U.S.C. 16272) is amended by striking subsection (b) and
10 inserting the following:

1 “(b) LIGHT WATER REACTOR SUSTAINABILITY PRO-
2 GRAM.—The Secretary shall carry out a light water reac-
3 tor sustainability program—

4 “(1) to ensure the achievement of maximum
5 benefits from existing nuclear generation;

6 “(2) to accommodate the increase in applica-
7 tions for nuclear power plant license renewals ex-
8 pected as of the date of enactment of this sub-
9 section;

10 “(3) to enable the continued operation of exist-
11 ing nuclear power plants through technology devel-
12 opment;

13 “(4) to improve the performance and reduce the
14 operation and maintenance costs of nuclear power
15 plants;

16 “(5) to promote the use of high-performance
17 computing to simulate nuclear reactor processes;

18 “(6) to coordinate with other research and de-
19 velopment programs of the Office of Nuclear Energy
20 to ensure that developed technologies and capabili-
21 ties are part of an integrated investment strategy,
22 the overall focus of which is improving the safety,
23 security, reliability, and economics of operating nu-
24 clear power plants; and

25 “(7) to focus on—

1 “(A) new capabilities relating to nuclear
2 energy research and development;

3 “(B) enabling technologies beyond indi-
4 vidual programs;

5 “(C) coordinating capabilities among the
6 research and development programs of the Of-
7 fice of Nuclear Energy;

8 “(D) examining new classes of materials
9 not considered for nuclear applications;

10 “(E) high-risk research, which could poten-
11 tially overcome technological limitations; and

12 “(F) the potential for industry partner-
13 ships to develop technologies relating to stor-
14 age, hydrogen production, high-temperature
15 process heat, and other relevant areas.”.

16 **SEC. 3. NUCLEAR ENERGY RESEARCH, DEVELOPMENT, AND**
17 **DEMONSTRATION.**

18 Section 952 of the Energy Policy Act of 2005 (42
19 U.S.C. 16272) is amended by adding at the end the fol-
20 lowing:

21 “(e) **ADVANCED REACTOR TECHNOLOGIES DEVEL-**
22 **OPMENT PROGRAM.—**

23 “(1) **IN GENERAL.—**The Secretary shall carry
24 out a program under which the Secretary shall con-
25 duct research relating to the development of innova-

1 (3) by inserting after paragraph (1) (as so re-
2 designated) the following:

3 “(2) CONSIDERATIONS.—In carrying out activi-
4 ties under the program, the Secretary shall consider
5 the potential benefits of those activities for civilian
6 nuclear applications, environmental remediation, and
7 national security.”;

8 (4) by inserting after paragraph (5) (as so re-
9 designated) the following:

10 “(6) AUTHORIZATION OF APPROPRIATIONS.—
11 There is authorized to be appropriated to the Sec-
12 retary to carry out the program \$40,000,000 for
13 each of fiscal years 2020 through 2024.”;

14 (5) by inserting before paragraph (1) (as so re-
15 designated) the following:

16 “(a) MATERIAL RECOVERY AND WASTE FORM DE-
17 VELOPMENT.—”; and

18 (6) by adding at the end the following:

19 “(b) ADVANCED FUELS.—

20 “(1) IN GENERAL.—The Secretary shall carry
21 out a program to conduct research relating to—

22 “(A) next-generation light water reactor
23 fuels that demonstrate improved—

24 “(i) performance; and

25 “(ii) accident tolerance; and

1 “(B) advanced reactor fuels that dem-
2 onstrate improved—

3 “(i) proliferation resistance; and

4 “(ii) use of resources.

5 “(2) REQUIREMENTS.—In carrying out the pro-
6 gram under this subsection, the Secretary shall—

7 “(A) focus on the development of accident-
8 tolerant fuel and cladding concepts that are ca-
9 pable of achieving initial commercialization by
10 December 31, 2025;

11 “(B) conduct studies regarding the means
12 by which those concepts would impact reactor
13 economics, the fuel cycle, operations, safety,
14 and the environment;

15 “(C) subject to paragraph (3), publish the
16 results of the studies conducted under subpara-
17 graph (B); and

18 “(D) cooperate with institutions of higher
19 education through the Nuclear Energy Univer-
20 sity and Integrated Research Projects programs
21 of the Department.

22 “(3) SENSITIVE INFORMATION.—The Secretary
23 shall not publish any information under paragraph
24 (2)(C) that is detrimental to national security, as de-
25 termined by the Secretary.

1 “(4) AUTHORIZATION OF APPROPRIATIONS.—
2 There is authorized to be appropriated to the Sec-
3 retary to carry out the program under this sub-
4 section \$120,000,000 for each of fiscal years 2020
5 through 2024.”.

6 **SEC. 5. NUCLEAR SCIENCE AND ENGINEERING SUPPORT.**

7 (a) IN GENERAL.—Section 954 of the Energy Policy
8 Act of 2005 (42 U.S.C. 16274) is amended—

9 (1) in the section heading, by striking
10 “**UNIVERSITY NUCLEAR**” and inserting
11 “**NUCLEAR**”;

12 (2) in subsection (b)—

13 (A) in the matter preceding paragraph (1),
14 by striking “this section” and inserting “this
15 subsection”; and

16 (B) by redesignating paragraphs (1)
17 through (5) as subparagraphs (A) through (E),
18 respectively, and indenting appropriately;

19 (3) in subsection (c), by redesignating para-
20 graphs (1) and (2) as subparagraphs (A) and (B),
21 respectively, and indenting appropriately;

22 (4) in subsection (d)—

23 (A) in the matter preceding paragraph (1),
24 by striking “this section” and inserting “this
25 subsection”; and

1 (B) by redesignating paragraphs (1)
2 through (4) as subparagraphs (A) through (D),
3 respectively, and indenting appropriately;

4 (5) in subsection (e), by striking “this section”
5 and inserting “this subsection”;

6 (6) in subsection (f)—

7 (A) by striking “this section” and inserting
8 “this subsection”; and

9 (B) by striking “subsection (b)(2)” and in-
10 serting “paragraph (2)(B)”;

11 (7) by redesignating subsections (a) through (f)
12 as paragraphs (1), (2), (3), (4), (6), and (7), respec-
13 tively, and indenting appropriately;

14 (8) by inserting after paragraph (4) (as so re-
15 designated) the following:

16 “(5) RADIOLOGICAL FACILITIES MANAGE-
17 MENT.—

18 “(A) IN GENERAL.—The Secretary shall
19 carry out a program under which the Secretary
20 shall provide project management, technical
21 support, quality engineering and inspection, and
22 nuclear material support to research reactors
23 located at universities.

24 “(B) AUTHORIZATION OF APPROPRIA-
25 TIONS.—In addition to any amounts appro-

1 priated to carry out the program under this
2 subsection, there is authorized to be appro-
3 priated to the Secretary to carry out the pro-
4 gram under this paragraph \$15,000,000 for
5 each of fiscal years 2020 through 2024.”;

6 (9) by inserting before paragraph (1) (as so re-
7 designated) the following:

8 “(a) UNIVERSITY NUCLEAR SCIENCE AND ENGI-
9 NEERING SUPPORT.—”; and

10 (10) by adding at the end the following:

11 “(b) NUCLEAR ENERGY APPRENTICESHIP SUBPRO-
12 GRAM.—

13 “(1) ESTABLISHMENT.—In carrying out the
14 program under subsection (a), the Secretary shall
15 establish a nuclear energy apprenticeship subpro-
16 gram under which the Secretary shall establish com-
17 petitively awarded traineeships and apprenticeships
18 in industries that are represented by skilled labor
19 unions and with universities to provide focused,
20 graduate-level training to meet highly focused needs
21 through a tailored academic graduate program that
22 delivers a curriculum with a rigorous thesis or dis-
23 sertation research requirement aligned with the crit-
24 ical needs of the Department with respect to mis-
25 sion-driven workforce.

1 “(2) REQUIREMENTS.—In carrying out the sub-
2 program under this subsection, the Secretary shall—

3 “(A) encourage appropriate partnerships
4 among National Laboratories, affected univer-
5 sities, and industry; and

6 “(B) on an annual basis, evaluate the
7 needs of the nuclear energy community to im-
8 plement traineeships for focused topical areas
9 addressing mission-specific workforce needs.

10 “(3) AUTHORIZATION OF APPROPRIATIONS.—

11 There is authorized to be appropriated to the Sec-
12 retary to carry out the subprogram under this sub-
13 section \$5,000,000 for each of fiscal years 2020
14 through 2024.”.

15 (b) CONFORMING AMENDMENT.—The table of con-
16 tents of the Energy Policy Act of 2005 (Public Law 109–
17 58; 119 Stat. 600) is amended by striking the item relat-
18 ing to section 954 and inserting the following:

 “Sec. 954. Nuclear science and engineering support.”.

19 **SEC. 6. INTERNATIONAL NUCLEAR ENERGY COOPERATION.**

20 (a) IN GENERAL.—Subtitle H of Title IX of the En-
21 ergy Policy Act of 2005 (42 U.S.C. 16341 et seq.) is
22 amended by adding at the end the following:

1 **“SEC. 986B. INTERNATIONAL NUCLEAR ENERGY COOPERA-**
2 **TION. —**

3 “(a) IN GENERAL.—The Secretary shall carry out a
4 program to develop bilateral collaboration initiatives with
5 a variety of countries through—

6 “(1) research and development agreements;

7 “(2) other relevant arrangements and action
8 plan updates; and

9 “(3) maintaining existing multilateral coopera-
10 tion commitments of—

11 “(A) the International Framework for Nu-
12 clear Energy Cooperation;

13 “(B) the Generation IV International
14 Forum;

15 “(C) the International Atomic Energy
16 Agency; and

17 “(D) any other international collaborative
18 effort with respect to advanced nuclear reactor
19 operations and safety.

20 “(b) SUBPROGRAM.—

21 “(1) IN GENERAL.—In carrying out the pro-
22 gram under subsection (a), the Secretary shall es-
23 tablish a subprogram that shall—

24 “(A) support diplomatic, nonproliferation,
25 climate, and international economic objectives
26 for the safe, secure, and peaceful use of nuclear

1 “(D) the Nuclear Regulatory Commis-
2 sion.”.

3 (b) CONFORMING AMENDMENT.—The table of con-
4 tents of the Energy Policy Act of 2005 (Public Law 109–
5 58; 119 Stat. 600) is amended by inserting after the item
6 relating to section 986A the following:

“Sec. 986B. International nuclear energy cooperation.”.