AMENDMENT IN THE NATURE OF A SUBSTITUTE

TO H.R. 6097

OFFERED BY Mr.Weber

Strike all after the enacting clause and insert the following:

SECTION 1. SHORT TITLE; TABLE OF CONTENTS.

(a) SHORT TITLE.—This Act may be cited as the ''Advanced Nuclear Energy Innovation Act of 2020''.

(b) TABLE OF CONTENTS.—The table of contents for this Act is as follows:

SEC. 2. NUCLEAR ENERGY RESEARCH AND DEVELOPMENT.

Section 952 of the Energy Policy Act of 2005 (42 U.S.C. 16272) is amended by adding at the end the following:

''(e) ADVANCED REACTOR TECHNOLOGIES RESEARCH AND DEVELOPMENT PROGRAM.—

''(1) IN GENERAL.—The Secretary shall carry out a program under which the Secretary shall conduct research relating to the development of ad-

vanced nuclear energy technologies that may offer improved safety, functionality, and affordability.

''(2) REQUIREMENTS.—The program under this subsection shall—

''(A) support efforts to reduce long-term technical barriers for advanced nuclear energy systems; and

''(B) be carried out in consultation with the Nuclear Regulatory Commission to ensure identification of any relevant concerns.

''(3) PUBLIC-PRIVATE PARTNERSHIPS.—

''(A) IN GENERAL.—In carrying out the program authorized in paragraph (1), the Secretary shall, to the maximum extent practicable and consistent with national security, make available nuclear energy research infrastructure to industry partners in order to achieve faster and cost-effective development of advanced nuclear energy technologies toward commercial readiness. In carrying out this subsection, the Secretary shall make available—

''(i) experimental capabilities and testing facilities;

''(ii) computational capabilities, modeling, and simulation tools;

''(iii) access to existing datasets and data validation tools; and

''(iv) land use and site information for demonstration facilities.

''(B) SELECTION.—

''(i) IN GENERAL.—The Secretary shall select industry partners for awards on a competitive, merit-reviewed basis.

''(ii) CONSIDERATIONS.—In selecting industry stakeholders under clause (i), the Secretary shall consider—

''(I) the information disclosed by the Department under this paragraph; and

''(II) any existing facilities the Department will provide for public-private partnership activities.

''(C) TERM.—An award made to an industry partner under this subsection shall be for a period of not more than 5 years, subject to the availability of appropriations, after which the award may be renewed, subject to a rigorous merit review.

''(4) DEFINITION OF ADVANCED NUCLEAR ENERGY.—In this subsection, the term 'advanced nuclear energy' means energy provided by—

''(A) a nuclear fission reactor, including a prototype plant (as defined in sections 50.2 and 52.1 of title 10, Code of Federal Regulations (or successor regulations)), with significant improvements compared to the most recent generation of fission reactors, including improvements such as—

''(i) additional inherent safety features;

''(ii) lower waste yields;

''(iii) improved fuel performance;

''(iv) increased tolerance to loss of fuel cooling;

''(v) enhanced reliability;

''(vi) increased proliferation resistance;

''(vii) increased thermal efficiency;

''(viii) reduced consumption of cooling water;

''(ix) the ability to integrate into electric applications and nonelectric applications;

''(x) modular sizes to allow for deployment that corresponds with the demand for electricity; or

''(xi) operational flexibility to respond to changes in demand for electricity and to complement integration with intermittent renewable energy; or

''(B) a fusion reactor.''.

SEC. 3. ADVANCED FUELS DEVELOPMENT.

Section 953 of the Energy Policy Act of 2005 (42 U.S.C. 16273) is amended—

(1) by inserting before subsection (a) the following:

''(a) MATERIAL RECOVERY AND WASTE FORM DEVELOPMENT.—''; and

(2) by redesignating subsections (a) through (d) as paragraphs (1), (3), (4), and (5) of subsection (a), respectively;

(3) in paragraph (1) (as so redesignated)—

(A) by striking ''this section'' and inserting ''this subsection'';

(B) by striking ''minimize environmental'' and inserting ''improve fuel cycle performance while minimizing the cost and complexity of processing, environmental impacts,''; and

(C) by striking ''the Generation IV'';

(4) by inserting after paragraph (1) (as so redesignated) the following:

''(2) CONSIDERATIONS.—In carrying out activities under the program, the Secretary shall consider the potential benefits of those activities for civilian nuclear applications, environmental remediation, and national security.'';

(5) by adding at the end the following:

''(b) ADVANCED FUELS.—

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

''(A) next-generation light water reactor fuels that demonstrate improved—

''(i) performance; and

''(ii) accident tolerance; and

''(B) advanced reactor fuels that demonstrate improved—

''(i) proliferation resistance; and

''(ii) use of resources.

''(2) REQUIREMENTS.—In carrying out the program under this subsection, the Secretary shall—

''(A) focus on the development of accident-tolerant fuel and cladding concepts that are ca-

pable of achieving initial commercialization by December 31, 2025;

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

''(C) subject to paragraph (3), publish the results of the studies conducted under subparagraph (B); and

''(D) cooperate with institutions of higher education through the Nuclear Energy University and Integrated Research Projects programs of the Department.

''(3) SENSITIVE INFORMATION.—The Secretary shall not publish any information under paragraph (2)(C) that is detrimental to national security, as determined by the Secretary.''.

SEC. 4. VERSATILE NEUTRON SOURCE.

Section 955(c) of the Energy Policy Act of 2005 (42 U.S.C. 16275(c)(1)) is amended to read as follows:

''(c) VERSATILE NEUTRON SOURCE.—

''(1) IN GENERAL.—In order to advance the research and development of domestic advanced, affordable, secure, and clean nuclear energy, the Secretary of Energy shall construct a versatile reactor-

based fast neutron source, which shall operate as a national user facility. The Secretary shall consult with the private sector, universities, National Laboratories, and relevant Federal agencies to ensure that the versatile neutron source is capable of meeting Federal research needs for neutron irradiation services.

''(2) FACILITY CAPABILITIES.—

''(A) CAPABILITIES.—The Secretary shall ensure that the facility described in paragraph (1) will provide, at a minimum, the following capabilities:

''(i) Fast neutron spectrum irradiation capability.

''(ii) Capacity for upgrades to accommodate new or expanded research needs.

''(B) CONSIDERATIONS.—In carrying out subparagraph (A), the Secretary shall consider the following:

''(i) Capabilities that support experimental high-temperature testing.

''(ii) Providing a source of fast neutrons at a neutron flux higher than that at which existing research facilities operate,

sufficient to enable research for an optimal base of prospective users.

''(iii) Maximizing irradiation flexibility and irradiation volume to accommodate as many concurrent users as possible.

''(iv) Capabilities for irradiation with neutrons of a lower energy spectrum.

''(v) Multiple loops for fuels and materials testing of different coolants.

''(vi) Additional pre-irradiation and post-irradiation examination capabilities.

''(vii) Lifetime operating costs and lifecycle costs.

''(3) START OF OPERATIONS.—The Secretary shall, to the maximum extent practicable, ensure that the start of full operations of the facility under this subsection occurs before December 31, 2026.

''(4) REPORTING.—The Secretary shall include in the annual budget request of the Department an explanation for any delay in the process of the Department in completing the user facility under this subsection by the deadline described in paragraph (3).

''(5) COORDINATION.—The Secretary shall leverage the best practices for management, construc-

tion, and operation of national user facilities from the Office of Science.

''(6) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to the Secretary for the Office of Nuclear Energy to carry out to completion the construction of the facility under this subsection—

''(A) $300,000,000 for fiscal year 2021;

''(B) $550,000,000 for fiscal year 2022;

''(C) $638,000,000 for fiscal year 2023;

''(D) $765,000,000 for fiscal year 2024; and

''(E) $763,000,000 for fiscal year 2025.''.

SEC. 5. HIGH-PERFORMANCE COMPUTATION COLLABORATIVE RESEARCH PROGRAM.

Section 957 of the Energy Policy Act of 2005 (42 U.S.C. 16277) is amended by adding at the end the following:

''(d) DUPLICATION.—The Secretary shall ensure the coordination of, and avoid unnecessary duplication of, the activities of this program with the activities of—

''(1) other research entities of the Department, including the National Laboratories, the Advanced Research Projects Agency–Energy, the Advanced Scientific Computing Research program; and

''(2) industry.''.

SEC. 6. NUCLEAR ENERGY STRATEGIC PLAN.

(a) IN GENERAL.—Subtitle E of title IX of the Energy Policy Act of 2005 (42 U.S.C. 16271 et seq.) is amended by adding at the end the following:

''SEC. 959A. NUCLEAR ENERGY STRATEGIC PLAN.

''(a) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, the Secretary shall submit to the Committee on Energy and Natural Resources of the Senate and the Committees on Energy and Commerce and Science, Space, and Technology of the House of Representatives a 10-year strategic plan for the Office of Nuclear Energy of the Department, in accordance with this section.

''(b) REQUIREMENTS.—In developing the strategic plan under this section, the Secretary shall specify expected timelines for, as applicable—

''(1) the accomplishment of relevant objectives under current programs of the Department; or

''(2) the commencement of new programs to accomplish those objectives.

''(c) UPDATES.—Not less frequently than once every 2 years, the Secretary shall submit to the Committee on Energy and Natural Resources of the Senate and the Committees on Energy and Commerce and Science, Space,

and Technology of the House of Representatives an updated 10-year strategic plan in accordance with subsection (b), which shall identify, and provide a justification for, any major deviation from a previous strategic plan submitted under this section.''.

(b) TABLE OF CONTENTS.—Section 1(b) of the Energy Policy Act of 2005 (42 U.S.C. 15801 note) is amended in the table of contents by inserting after the item relating to section 959 the following:

''Sec. 959A. Nuclear energy strategic plan.''.

Amend the title so as to read: ''A bill to establish and support advanced nuclear energy research and development programs at the Department of Energy, and for other purposes.''.