H. R. 4066

To enable high-performance computation and supportive research and nuclear energy innovation.

IN THE HOUSE OF REPRESENTATIVES

November 18, 2015

Mr. GRAYSON introduced the following bill; which was referred to the Committee on Science, Space, and Technology

A BILL

To enable high-performance computation and supportive research and nuclear energy innovation.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the “Nuclear Innovation Act”.

SECTION 2. DEFINITIONS.

In this Act:

(1) ADVANCED FISSION REACTOR.—The term “advanced fission reactor” means a nuclear fission reactor with significant improvements over the most
recent generation of nuclear reactors, which may include inherent safety features, lower waste yields, greater fuel utilization, superior reliability, resistance to proliferation, and increased thermal efficiency.

(2) **DEPARTMENT.**—The term “Department” means the Department of Energy.

(3) **NATIONAL LABORATORIES.**—The term “National Laboratories” has the meaning given the term in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801).

(4) **SECRETARY.**—The term “Secretary” means the Secretary of Energy.

**SEC. 3. HIGH-PERFORMANCE COMPUTATION AND SUPPORTIVE RESEARCH.**

(a) **MODELING AND SIMULATION.**—The Secretary shall carry out a program to enhance the Nation’s capabilities to develop new reactor technologies through high-performance computation modeling and simulation techniques. This program shall coordinate with relevant Federal agencies through the National Strategic Computing Initiative created under Executive Order 13702 (July 29, 2015) while taking into account the following objectives:

(1) Utilizing expertise from the private sector, universities, and National Laboratories to develop
computational software and capabilities that prospective users may access to accelerate research and development of advanced fission reactor systems, nuclear fusion systems, and reactor systems for space exploration.

(2) Developing computational tools to simulate and predict nuclear phenomena that may be validated through physical experimentation.

(3) Increasing the utility of the Department’s research infrastructure by coordinating with the Advanced Scientific Computing Research program within the Office of Science.

(4) Leveraging experience from the Energy Innovation Hub for Modeling and Simulation.

(5) Ensuring that new experimental and computational tools are accessible to relevant research communities.

(b) Supportive Research Activities.—The Secretary shall consider support for additional research activities to maximize the utility of its research facilities, including physical processes to simulate degradation of materials and behavior of fuel forms and for validation of computational tools.
SEC. 4. ENABLING NUCLEAR ENERGY INNOVATION.

(a) NATIONAL REACTOR INNOVATION CENTER.—The Secretary shall carry out a program to enable the testing and demonstration of reactor concepts to be proposed and funded by the private sector. The Secretary shall leverage the technical expertise of relevant Federal agencies and National Laboratories in order to minimize the time required to enable construction and operation of privately funded experimental reactors at National Laboratories or other Department-owned sites while ensuring reasonable safety for persons working within these sites. Such reactors shall operate to meet the following objectives:

(1) Enabling physical validation of novel reactor concepts.

(2) Resolving technical uncertainty and increasing practical knowledge relevant to safety, resilience, security, and functionality of first-of-a-kind reactor concepts.

(3) General research and development to improve nascent technologies.

(b) REPORTING REQUIREMENT.—Not later than 180 days after the date of enactment of this Act, the Secretary, in consultation with the National Laboratories, relevant Federal agencies, and other stakeholders, shall transmit to the Committee on Science, Space, and Technology of the House of Representatives and the Committee
on Energy and Natural Resources of the Senate a report
assessing the Department’s capabilities to authorize, host,
and oversee privately funded fusion and advanced fission
experimental reactors as described under subsection (a).
The report shall address the following:

(1) The Department’s safety review and over-
sight capabilities, including options to leverage ex-
pertise from the Nuclear Regulatory Commission
and National Laboratories.

(2) Potential sites capable of hosting activities
described under subsection (a).

(3) The efficacy of the Department’s available
contractual mechanisms to partner with the private
sector and Federal agencies, including cooperative
research and development agreements, strategic
partnership projects, and agreements for commer-
cializing technology.

(4) Potential cost structures related to physical
security, decommissioning, liability, and other long
term project costs.

(5) Other challenges or considerations identified
by the Secretary.