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114TH CONGRESS
2D SESSION

H. R. 5466

To secure the United States technological edge in commercial and military aviation.

IN THE HOUSE OF REPRESENTATIVES

JUNE 14, 2016

Mr. KNIGHT (for himself and Mr. HONDA) introduced the following bill; which was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Armed Services, for a period to be subsequently determined by the Speaker, in each case for consideration of such provisions as fall within the jurisdiction of the committee concerned

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A BILL

To secure the United States technological edge in commercial and military aviation.

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 ''Aeronautics Innovation Act''.

SEC. 2. FINDINGS.

The Congress makes the following findings:

(1) Aviation accounts for more than $1,500,000,000,000 of total United States economic

activity annually and is one of the few industries that generates a positive trade balance, including $82,500,000,000 in 2015 alone.

(2) Growth in the commercial aircraft market is projected to offer 8 to 10 trillion dollars in new aircraft sales, parts, and services over the next 17 years. International governments are boosting their research and development investments to give their domestic industries competitive advantages in the aircraft market.

(3) NASA's aeronautics research and collaborative ventures yield innovations that can eventually be utilized in the commercial sector, opening up entirely new markets, enabling the United States aviation industry to grow and maintain global competitiveness, providing high-quality engineering and manufacturing jobs, and benefiting the quality of life for our citizens.

(4) All of NASA's other directorates and capabilities, including those in space, depend on research and technology that originated and is maintained in NASA's Aeronautics Centers.

(5) Aviation plays a central role in our national security strategy, and our technological advantage

over potential adversaries must be maintained with sustained and focused research and development.

(6) NASA Aeronautics Research Mission Directorate's six strategic thrusts (safe, efficient growth in global operations; innovation in commercial supersonic aircraft; ultra-efficient commercial vehicles; transition to low-carbon propulsion; real-time, system-wide safety assurance; and assured autonomy for aviation transformation) are effective and necessary research areas for the development of next generation aeronautics technology that will preserve the United States lead in the global aviation industry.

(7) Continued progress in the science and technology of aeronautics is crucial to the United States sustained economic success and the protection of the United States security interests at home and around the world, as acknowledged in the 2006 National Aeronautics Research and Development Policy. To ensure Federal efforts remain on a disciplined path to meet national objectives, the Director of the Office of Science and Technology Policy is responsible for the implementation and biennial review of the Nation's aeronautics research and development plan.

(8) We need an aeronautics program worthy of the United States of America and capable of meeting our 21st century challenges.

SEC. 3. DEFINITIONS.

In this Act:

(1) ADMINISTRATOR.—The term ''Administrator'' means the Administrator of NASA.

(2) AERONAUTICS STRATEGIC IMPLEMENTATION PLAN.—The term ''Aeronautics Strategic Implementation Plan'' means the Aeronautics Strategic Implementation Plan issued by the NASA Aeronautics Research Mission Directorate.

(3) APPROPRIATE CONGRESSIONAL COMMITTEES.—The term ''appropriate congressional committees'' means the Committee on Armed Services, the Committee on Science, Space, and Technology, and the Committee on Appropriations of the House of Representatives and the Committee on Armed Services, the Committee on Commerce, Science, and Transportation, and the Committee on Appropriations of the Senate.

(4) NASA.—The term ''NASA'' means the National Aeronautics and Space Administration.

SEC. 4. EXPERIMENTAL PLANE PROGRAMS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that—

(1) developing high-risk, precompetitive aerospace technology for which there is not yet a profit rationale is a fundamental NASA role;

(2) near-full-scale to full-scale vehicle flight test experimentation and validation are necessary for—

(A) transitioning new technologies to commercial and military aeronautics use; and

(B) capturing the full breadth of benefits from the Aeronautics Research Mission Directorate's investments in priority programs called for in—

(i) the National Aeronautics Research and Development Plan issued by the National Science and Technology Council in February 2010;

(ii) the NASA 2014 Strategic Plan; and

(iii) the Aeronautics Strategic Implementation Plan;

(3) a level of funding that adequately supports full-scale experimentation and related infrastructure must be assured over a sustained period of time to restore NASA's capacity to see legacy priority pro-

grams through to completion and achieve national economic and security objectives;

(4) NASA should establish a long-term goal of increasing its Aeronautics research spending, over time, to 10 percent of its overall budget; and

(5) NASA's gradual completion of Next Generation Air Transportation System tools and technologies will allow NASA to refocus its resources on its traditional studies of the problems of flight with a view to their practical solutions.

(b) NATIONAL POLICY.—It is the policy of the United States to maintain world leadership in air power projection and industrial aviation leadership, and to this end one of the fundamental objectives of NASA aeronautics research is the steady progression and expansion of high-speed flight capabilities, including the underlying aerothermodynamics, high temperature structures, propulsion, and flight controls science and technologies.

(c) ESTABLISHMENT OF PROGRAMS.—NASA shall establish the following full-scale technology, experimental flight research, multidisciplinary, and revolutionary concepts programs to demonstrate innovative advances in aeronautics and aviation and the feasibility of transformative ideas and concepts:

(1) A low-boom supersonic aircraft program, to demonstrate supersonic aircraft designs and technologies that reduce sonic boom noise to levels that will encourage the repeal of domestic and international bans on commercial supersonic flight overland.

(2) Three subsonic flight programs, from among the ultra-efficient X-Plane and hybrid-electric X-Plane programs, each centered around a set of new configuration concepts or technologies determined by the Administrator of NASA, to—

(A) enable significant increases in energy efficiency and lower life cycle emissions in the aviation system;

(B) demonstrate transformative propulsion systems, as described in the 3rd and 4th strategic thrusts of the Aeronautics Strategic Implementation Plan (ultra-efficient commercial vehicles and the transition to low-carbon propulsion);

(C) introduce and integrate a progression of technologies and systems enabling transformative levels of environmental-related performance improvements in the next generations of large civil air transports; and

(D) culminate in large-scale X-Plane demonstrations.

(3) An unmanned aircraft operations program that—

(A) researches, develops, and tests capabilities and concepts for integrating unmanned aircraft systems into the national airspace system;

(B) advances technologies for a future unmanned aircraft traffic management system for low altitude operations;

(C) advances technologies for unmanned vehicles and informs airworthiness requirements for all categories of unmanned systems;

(D) benefits industry, especially as operations transition to more autonomous systems; and

(E) is consistent with national safety and national security objectives.

(d) PROGRAM ELEMENTS.—For each of the programs established under subsection (c), NASA shall—

(1) include development of experimental aircraft (X-Plane), experimental systems (X-System), multiple technologies, and all necessary supporting flight assets;

(2) pursue a robust technology maturation and flight validation program that addresses challenges in technology development and maturation;

(3) improve necessary facilities and flight testing capabilities to support the program;

(4) coordinate demonstrations with the aviation community, the armed services, and the Defense Advanced Research Projects Agency; and

(5) ensure that the program remains aligned with the Aeronautics Strategic Implementation Plan.

(e) CROWDSOURCING PILOT PROGRAM.—

(1) ESTABLISHMENT.—The Administrator shall establish a crowdsourcing pilot program to allow NASA to experiment with the crowdsourcing of early stage experimental aerospace vehicle design work.

(2) MECHANISM.—As part of such program, NASA shall establish a mechanism from which to crowdsource the preliminary designs of advanced aerospace vehicles that will increase the speed, range, capacity, safety, and affordability of aerospace transportation, such as supersonic or hypersonic aircraft.

(3) PRIVATE SECTOR EXPERTS.—NASA may work with private sector subject matter experts in

crowdsourcing to assist in the development of the pilot program.

(4) SUNSET.—This pilot program shall terminate 5 years after the date of enactment of this Act.

(5) REPORT.—NASA shall report to the appropriate congressional committees at the end of the pilot program to communicate lessons learned under the program and make recommendations for how benefits of crowdsourcing may be more broadly applied to NASA objectives.

SEC. 5. HYPERSONICS.

(a) SENSE OF CONGRESS.—It is the sense of Congress that the Nation's understanding of hypersonic technologies and weapons will play an increasingly important role in our national security. Maintaining United States preeminence in hypersonics research and development is key to our military's ability to project power and defend the homeland as our adversaries also seek to develop hypersonic capabilities.

(b) POLICY.—It is the policy of the United States to maintain a clear and consistent commitment to a disciplined research, development, and testing strategy to bring hypersonic technology to maturity on a schedule that sustains the United States strategic military edge.

(c) JOINT TECHNOLOGY OFFICE ON HYPERSONICS.—Section 218 of the John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109–364; 10 U.S.C. 2358 note), as most recently amended by section 1079(f) of the National Defense Authorization Act for Fiscal Year 2016 (Public Law 114–192; 129 Stat. 999), is amended by striking subsections (c) through (e) and inserting the following:

''(c) RESPONSIBILITIES.—In carrying out the program required by subsection (b), the joint technology office established under subsection (a) shall do the following:

''(1) Coordinate and integrate current and future research, development, test, and evaluation programs and system demonstration programs of the Department of Defense on hypersonics.

''(2) Undertake appropriate actions to ensure—

''(A) close and continuous integration of the programs on hypersonics of the military departments with the programs on hypersonics across the Federal Government; and

''(B) that both foundational research and developmental testing resources are adequate and robustly funded, and that facilities are made available in a timely manner to support

hypersonics research, demonstration programs, and system development.

''(3) Approve demonstration programs on hypersonic systems to speed operational applications.

''(4) Ensure that any demonstration program on hypersonic systems that is carried out in any year after its approval under paragraph (3) is carried out only if certified under subsection (e) as being consistent with the roadmap under subsection (d).

''(5) Develop a well-defined path for hypersonic technologies to transition to operational capabilities for the warfighter.

''(d) ROADMAP.—

''(1) ROADMAP REQUIRED.—The joint technology office established under subsection (a) shall develop and maintain a roadmap for the hypersonics programs of the Department of Defense. The Secretary of Defense shall ensure that all elements of the roadmap are updated to reflect changes in national hypersonics assessments and needs not less than once every two years.

''(2) COORDINATION.—The roadmap shall be developed and updated under paragraph (1) in coordination with—

''(A) the Joint Staff;

''(B) the National Security Council;

''(C) the Administrator of the National Aeronautics and Space Administration;

''(D) the Director of the Office of Science and Technology Policy;

''(E) the Director of the Defense Advanced Research Projects Agency; and

''(F) the Director of National Intelligence.

''(3) ELEMENTS.—The roadmap shall include the following matters:

''(A) Anticipated or potential mission requirements for offensive hypersonics systems and defenses against hypersonics systems of potential adversaries.

''(B) Short-term, mid-term, and long-term goals for Department of Defense hypersonics, which shall be consistent with the missions and anticipated requirements of the Department over the applicable period.

''(C) A schedule for meeting such goals, including—

''(i) the activities and funding anticipated to be required for meeting such goals; and

"(ii) the activities of the National Aeronautics and Space Administration to be leveraged by the Department of Defense to meet such goals.

"(D) The research, development, test, and evaluation facilities required to support the activities identified in subparagraph (C), along with the schedule and funding required to upgrade those facilities, as necessary.

"(E) Recommendations on the programmatic resources necessary for each agency to advance the collective goals and priorities of the roadmap in an efficient, sustained manner.

"(F) Recommendations to transition hypersonic science and technology to operational capabilities for the warfighter.

"(G) Acquisition transition plans for hypersonics.

"(4) SUBMITTAL TO CONGRESS.—The Secretary of Defense shall submit to the congressional defense committees—

"(A) at the same time as the submittal to Congress of the budget for fiscal year 2018 (as submitted pursuant to section 1105 of title 31,

United States Code), the roadmap developed under paragraph (1); and

"(B) at the same time as the submittal to Congress of the budget for each even-numbered fiscal year after 2018, the roadmap updated under paragraph (1).

"(e) ANNUAL REVIEW AND CERTIFICATION OF FUNDING.—

"(1) ANNUAL REVIEW.—The joint technology office established under subsection (a) shall conduct, on an annual basis, a review of—

"(A) the funding available for research, development, test, and evaluation programs and demonstration programs within the Department of Defense for hypersonics, in order to determine whether or not such funding is consistent with the roadmap developed under subsection (d); and

"(B) the hypersonics demonstration programs of the Department of Defense, in order to determine whether or not such programs avoid duplication of effort and support the goals of the Department in a manner consistent with the roadmap developed under subsection (d).

''(2) CERTIFICATION.—The joint technology office established under subsection (a) shall, as a result of each review under paragraph (1), certify to the Secretary of Defense whether or not the funding and programs subject to such review are consistent with the roadmap developed under subsection (d).

''(3) TERMINATION.—The requirements of this subsection shall terminate after the submittal to Congress of the budget for fiscal year 2021 pursuant to section 1105 of title 31, United States Code.

''(f) REPORTS TO CONGRESS.—If, as a result of a review under subsection (e), funding or a program on hypersonics is certified under that subsection not to be consistent with the roadmap developed under subsection (d), the Secretary of Defense shall submit to the congressional defense committees, at the same time as the submittal to Congress of the budget (as submitted pursuant to section 1105 of title 31, United States Code), a report on such funding or program, as the case may be, describing how such funding or program is not consistent with the roadmap, together with a statement of the actions to be taken by the Department of Defense.

''(g) HEAD OF OFFICE.—The Secretary of Defense shall appoint an individual who is a recognized authority in the field of hypersonics to serve as the Director of the

joint technology office established under subsection (a). The Director shall serve as the head of the office and as the principal adviser to the Office of the Secretary of Defense on all matters related to hypersonics, reporting directly to the Deputy Secretary of Defense.

''(h) STAFF.—Secretary of Defense shall fix the compensation of the Director and shall appoint and fix the compensation of such other personnel as may be necessary to enable the joint technology office established under subsection (a) to carry out its functions.''.

(d) INTERAGENCY RESEARCH, DEVELOPMENT, TESTING, AND EVALUATION COORDINATION.—The Director of the Office of Science and Technology Policy, through the National Science and Technology Council, shall ensure that Federal hypersonics research, development, testing, and evaluation activities are coordinated and executed pursuant to a disciplined investment plan. In doing so, the Director shall—

(1) develop and maintain a strategic plan to advance the United States hypersonics research, development, test and evaluation goals in an efficient, sustained manner;

(2) identify test and evaluation infrastructure critical to hypersonics research, development, testing, and evaluation and make recommendations to

the President for upgrading those facilities as necessary;

(3) promote policies for a robust hypersonics workforce; and

(4) encourage Federal agencies conducting hypersonics research, development, testing, and evaluation to develop and promote policies that sustain their respective agencies' efforts in implementing the coordinated Federal hypersonics agenda.

(e) AIR FORCE HYPERSONICS CAPABILITIES ACQUISITION.—The Secretary of the Air Force shall consider findings from all Federal research, development, and demonstration projects that relate to hypersonics in making and executing acquisition plans for the Air Force.

(f) CIVILIAN HYPERSONICS REPORT.—Not later than 120 days after the date of enactment of this Act, NASA shall transmit to Congress a report that—

(1) collects broad civilian input identifying benefits to the private sector and universities from NASA support for precompetitive hypersonics science; and

(2) contains a list of proposed research and technology investments, prioritized on the basis of the national interest that will be served, potential

economic impact, and cost of each such technology investment proposal.

(g) 21ST CENTURY HYPERSONICS WORKFORCE.—

(1) RESEARCH AND DEVELOPMENT CAPABILITIES.—

(A) IN GENERAL.—In order to build and prepare the workforce for hypersonics development, the Air Force Office of Scientific Research, the Office of Naval Research, and the appropriate Department of the Army science and technology entities, in consultation with the Director of the Office of Science and Technology Policy, through the National Science and Technology Council, shall expand, intensify, and coordinate programs and activities with research institutions to strengthen their capabilities for research and development of hypersonics technology and related education and training.

(B) GRANTS.—To carry out subparagraph (A), the Air Force Office of Scientific Research, the Office of Naval Research, and the appropriate Department of the Army science and technology entities may make grants to research institutions. Each such grant shall be for

a period of not to exceed 3 years, and may be extended for one or more additional periods not exceeding 3 years if—

(i) the recipient's program has been reviewed and approved by an appropriate technical and scientific peer review group established by the Director of the Air Force Office of Scientific Research, the Office of Naval Research, or the appropriate Department of the Army science and technology entity; and

(ii) such group has recommended to the appropriate Director that such grant period should be extended.

(2) PILOT PROGRAMS.—Not later than 180 days after the date of enactment of this Act, the Director of the Office of Science and Technology Policy, through the National Science and Technology Council, shall recommend to the Air Force Office of Scientific Research, the Office of Naval Research, and the appropriate Department of the Army science and technology entities a series of hypersonics technology prototype projects to be completed over the next 2–5 years that meet research objectives specified in the joint technology office hypersonics road-

map developed under section 218(d) of the John Warner National Defense Authorization Act for Fiscal Year 2007, as added by subsection (c) of this section or the civilian hypersonics report transmitted under subsection (f).

SEC. 6. 21ST CENTURY AERONAUTICS RESEARCH CAPABILITIES INITIATIVE.

(a) ESTABLISHMENT.—The Administrator shall establish a 21st Century Aeronautics Capabilities Initiative, within the Construction of Facilities Account, to ensure that NASA possesses the infrastructure capabilities necessary to conduct proposed flight demonstration projects across the range of NASA aeronautics interests. As part of such Initiative, the Administrator shall carry out the following activities:

(1) Any investments necessary to upgrade and create facilities for civil and national security aeronautics research to support advancements in long-term foundational science and technology, advanced aircraft systems, air traffic management systems, fuel efficiency, system-wide safety assurance, autonomous aviation, and supersonic and hypersonic aircraft design and development.

(2) Any measures supporting flight testing activities, to include continuous refinement and devel-

opment of free-flight test techniques and methodologies, upgrades and improvements to real-time tracking and data acquisition, and any other measures related to aeronautics research support and modernization as the Administrator may consider appropriate to carry out the scientific study of the problems of flight, with a view to their practical solution.

(b) AUTHORIZATION OF APPROPRIATIONS.—For the purpose of carrying out this section, there are authorized to be appropriated to NASA $40,000,000, to be derived from amounts otherwise authorized to be appropriated to NASA.

(c) REPORT.—

(1) REPORT REQUIRED.—Not later than 60 days after the date of enactment of this Act, the Administrator shall transmit to Congress a report containing a 5-year plan for the implementation of the 21st Century Aeronautics Research Capabilities Initiative.

(2) ELEMENTS.—The report required by this subsection shall include—

(A) a description of proposed projects;

(B) a description of how the projects align with the ARMD Strategic Implementation Plan or the roadmap developed by the joint tech-

nology office on hypersonics under section 218(d) of the John Warner National Defense Authorization Act for Fiscal Year 2007, as added by section 5(c) of this Act; and

(C) a timetable for carrying out activities and initiatives authorized under this section.

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