in which the plan is submitted under paragraph (3). The strategic plan shall be based on a comprehensive review of both funded and unfunded test and evaluation requirements of the Department, future threats to national security, and the adequacy of the test and evaluation facilities and resources of the Department to meet those future requirements and threats."; and

(2) in paragraph (2)(C), by striking "needed to meet such requirements" and inserting "needed to meet current and future requirements based on current and emerging threats".

**SEC. 222. COLLABORATION BETWEEN DEFENSE LABORATORIES, INDUSTRY, AND ACADEMIA; OPEN CAMPUS PROGRAM.**

(a) COLLABORATION.—The Secretary of Defense may carry out activities to prioritize innovative collaboration between Department of Defense science and technology reinvention laboratories, industry, and academia.

(b) OPEN CAMPUS PROGRAM.—In carrying out subsection (a), the Secretary, acting through the Commander of the Air Force Research Laboratory, the Commander of the Army Research, Development and Engineering Command, and the Chief of Naval Research, or such other officials of the Department as the Secretary considers appropriate, may develop and implement an open campus program for the Department science and technology reinvention laboratories which shall be modeled after the open campus program of the Army Research Laboratory.

**SEC. 223. PERMANENT EXTENSION AND CODIFICATION OF AUTHORITY TO CONDUCT TECHNOLOGY PROTECTION FEATURES ACTIVITIES DURING RESEARCH AND DEVELOPMENT OF DEFENSE SYSTEMS.**

(a) IN GENERAL.—Chapter 139 of title 10, United States Code, is amended by inserting before section 2358 the following new section:

**"§ 2357. Technology protection features activities**

"(a) ACTIVITIES.—The Secretary of Defense shall carry out activities to develop and incorporate technology protection features in a designated system during the research and development phase of such system.

"(b) COST-SHARING.—Any contract for the design or development of a system resulting from activities under subsection (a) for the purpose of enhancing or enabling the exportability of the system, either for the development of program protection strategies for the system or the design and incorporation of exportability features into the system, shall include a cost-sharing provision that requires the contractor to bear half of the cost of such activities, or such other portion of such cost as the Secretary considers appropriate upon showing of good cause.

"(c) DEFINITIONS.—In this section:

"(1) The term 'designated system' means any system (including a major system, as defined in section 2302(5) of title 10, United States Code) that the Under Secretary of Defense for Acquisition and Sustainment designates for purposes of this section.

"(2) The term 'technology protection features' means the technical modifications necessary to protect critical program

information, including anti-tamper technologies and other systems engineering activities intended to prevent or delay exploitation of critical technologies in a designated system.".

(b) CLERICAL AMENDMENT.—The table of sections at the beginning of chapter 139 of title 10, United States Code, is amended by inserting before the item relating to section 2358 the following new item:

"2357. Technology protection features activities.".

(c) CONFORMING REPEAL.—Section 243 of the Ike Skelton National Defense Authorization Act for Fiscal Year 2011 (10 U.S.C. 2358 note) is repealed.

**SEC. 224. CODIFICATION AND REAUTHORIZATION OF DEFENSE RESEARCH AND DEVELOPMENT RAPID INNOVATION PROGRAM.**

(a) CODIFICATION.—

(1) IN GENERAL.—Chapter 139 of title 10, United States Code, is amended by inserting after section 2359 the following new section:

**"§ 2359a. Defense Research and Development Rapid Innovation Program**

"(a) PROGRAM ESTABLISHED.—(1) The Secretary of Defense shall establish a competitive, merit-based program to accelerate the fielding of technologies developed pursuant to phase II Small Business Innovation Research Program projects, technologies developed by the defense laboratories, and other innovative technologies (including dual use technologies).

"(2) The purpose of this program is to stimulate innovative technologies and reduce acquisition or lifecycle costs, address technical risks, improve the timeliness and thoroughness of test and evaluation outcomes, and rapidly insert such products directly in support of primarily major defense acquisition programs, but also other defense acquisition programs that meet critical national security needs.

"(b) GUIDELINES.—The Secretary shall issue guidelines for the operation of the program. At a minimum such guidance shall provide for the following:

"(1) The issuance of one or more broad agency announcements or the use of any other competitive or merit-based processes by the Department of Defense for candidate proposals in support of defense acquisition programs as described in subsection (a).

"(2) The review of candidate proposals by the Department of Defense and by each military department and the merit-based selection of the most promising cost-effective proposals for funding through contracts, cooperative agreements, and other transactions for the purposes of carrying out the program.

"(3) The total amount of funding provided to any project under the program from funding provided under subsection (d) shall not exceed $3,000,000, unless the Secretary, or the Secretary's designee, approves a larger amount of funding for the project.

"(4) No project shall receive more than a total of two years of funding under the program from funding provided

under subsection (d), unless the Secretary, or the Secretary's designee, approves funding for any additional year.

"(5) Mechanisms to facilitate transition of follow-on or current projects carried out under the program into defense acquisition programs, through the use of the authorities of section 2302e of this title or such other authorities as may be appropriate to conduct further testing, low rate production, or full rate production of technologies developed under the program.

"(6) Projects are selected using merit-based selection procedures and the selection of projects is not subject to undue influence by Congress or other Federal agencies.

"(c) TREATMENT PURSUANT TO CERTAIN CONGRESSIONAL RULES.—Nothing in this section shall be interpreted to require or enable any official of the Department of Defense to provide funding under this section to any earmark as defined pursuant to House Rule XXI, clause 9, or any congressionally directed spending item as defined pursuant to Senate Rule XLIV, paragraph 5.

"(d) FUNDING.—Subject to the availability of appropriations for such purpose, the amounts authorized to be appropriated for research, development, test, and evaluation for a fiscal year may be used for such fiscal year for the program established under subsection (a).

"(e) TRANSFER AUTHORITY.—(1) The Secretary may transfer funds available for the program to the research, development, test, and evaluation accounts of a military department, defense agency, or the unified combatant command for special operations forces pursuant to a proposal, or any part of a proposal, that the Secretary determines would directly support the purposes of the program.

"(2) The transfer authority provided in this subsection is in addition to any other transfer authority available to the Department of Defense.".

(2) CLERICAL AMENDMENT.—The table of sections at the beginning of chapter 139 of such title is amended by inserting after the item relating to section 2359 the following new item:

"2359a. Defense Research and Development Rapid Innovation Program.".

(b) CONFORMING AMENDMENTS.—

(1) REPEAL OF OLD PROVISION.—Section 1073 of the Ike Skelton National Defense Authorization Act for Fiscal Year 2011 (Public Law 111–383; 10 U.S.C. 2359 note) is hereby repealed.

(2) REPEAL OF OLD TABLE OF CONTENTS ITEM.—The table of contents in section 2(b) of such Act is amended by striking the item relating to section 1073.

**SEC. 225. PROCEDURES FOR RAPID REACTION TO EMERGING TECHNOLOGY.**

(a) REQUIREMENT TO ESTABLISH PROCEDURES.—Not later than 180 days after the date of the enactment of this Act, the Under Secretary of Defense for Research and Engineering shall prescribe procedures for the designation and development of technologies that are—

(1) urgently needed—

(A) to react to a technological development of an adversary of the United States; or

(B) to respond to a significant and urgent emerging technology; and

(2) not receiving appropriate research funding or attention from the Department of Defense.

(b) ELEMENTS.—The procedures prescribed under subsection (a) shall include the following:

(1) A process for streamlined communications between the Under Secretary, the Joint Chiefs of Staff, the commanders of the combatant commands, the science and technology executives within each military department, and the science and technology community, including—

(A) a process for the commanders of the combatant commands and the Joint Chiefs of Staff to communicate their needs to the science and technology community; and

(B) a process for the science and technology community to propose technologies that meet the needs communicated by the combatant commands and the Joint Chiefs of Staff.

(2) Procedures for the development of technologies proposed pursuant to paragraph (1)(B), including—

(A) a process for demonstrating performance of the proposed technologies on a short timeline;

(B) a process for developing a development strategy for a technology, including integration into future budget years; and

(C) a process for making investment determinations based on information obtained pursuant to subparagraphs (A) and (B).

(c) BRIEFING.—Not later than 180 days after the date of the enactment of this Act, the Under Secretary shall provide to the congressional defense committees a briefing on the procedures required by subsection (a).

**SEC. 226. ACTIVITIES ON IDENTIFICATION AND DEVELOPMENT OF ENHANCED PERSONAL PROTECTIVE EQUIPMENT AGAINST BLAST INJURY.**

(a) ACTIVITIES REQUIRED.—During calendar year 2019, the Secretary of the Army shall, in consultation with the Director of Operational Test and Evaluation, carry out a set of activities to identify and develop personal equipment to provide enhanced protection against injuries caused by blasts in combat and training.

(b) ACTIVITIES.—

(1) CONTINUOUS EVALUATION PROCESS.—For purposes of the activities required by subsection (a), the Secretary shall establish a process to continuously solicit from government, industry, academia, and other appropriate entities personal protective equipment that is ready for testing and evaluation in order to identify and evaluate equipment or clothing that is more effective in protecting members of the Armed Forces from the harmful effects of blast injuries, including traumatic brain injuries, and would be suitable for expedited procurement and fielding.

(2) GOALS.—The goals of the activities shall include:

(A) Development of streamlined requirements for procurement of personal protective equipment.

(B) Appropriate testing of personal protective equipment prior to procurement and fielding.

(C) Development of expedited mechanisms for deployment of effective personal protective equipment.

(D) Identification of areas of research in which increased investment has the potential to improve the quality of personal protective equipment and the capability of the industrial base to produce such equipment.

(E) Such other goals as the Secretary considers appropriate.

(3) PARTNERSHIPS FOR CERTAIN ASSESSMENTS.—As part of the activities, the Secretary should continue to establish partnerships with appropriate academic institutions for purposes of assessing the following:

(A) The ability of various forms of personal protective equipment to protect against common blast injuries, including traumatic brain injuries.

(B) The value of real-time data analytics to track the effectiveness of various forms of personal protective equipment to protect against common blast injuries, including traumatic brain injuries.

(C) The availability of commercial-off the-shelf personal protective technology to protect against traumatic brain injury resulting from blasts.

(D) The extent to which the equipment determined through the assessment to be most effective to protect against common blast injuries is readily modifiable for different body types and to provide lightweight material options to enhance maneuverability.

(c) AUTHORITIES.—In carrying out activities under subsection (a), the Secretary may use any authority as follows:

(1) Experimental procurement authority under section 2373 of title 10, United States Code.

(2) Other transactions authority under section 2371 and 2371b of title 10, United States Code.

(3) Authority to award technology prizes under section 2374a of title 10, United States Code.

(4) Authority under the Defense Acquisition Challenge Program under section 2359b of title 10, United States Code.

(5) Any other authority on acquisition, technology transfer, and personnel management that the Secretary considers appropriate.

(d) CERTAIN TREATMENT OF ACTIVITIES.—Any activities under this section shall be deemed to have been through the use of competitive procedures for the purposes of section 2304 of title 10, United States Code.

(e) ON-GOING ASSESSMENT FOLLOWING ACTIVITIES.—After the completion of activities under subsection (a), the Secretary shall, on an on-going basis, do the following:

(1) Evaluate the extent to which personal protective equipment identified through the activities would—

(A) enhance survivability of personnel from blasts in combat and training; and

(B) enhance prevention of brain damage, and reduction of any resultant chronic brain dysfunction, from blasts in combat and training.

(2) In the case of personal protective equipment so identified that would provide enhancements as described in paragraph (1), estimate the costs that would be incurred to procure

such enhanced personal protective equipment, and develop a schedule for the procurement of such equipment.

(3) Estimate the potential health care cost savings that would occur from expanded use of personal protective equipment described in paragraph (2).

(f) REPORT.—Not later than December 1, 2019, the Secretary shall submit to the Committee on Armed Services of the Senate and the Committee on Armed Services of the House of Representatives a report on the activities under subsection (a) as of the date of the report.

(g) FUNDING.—Of the amount authorized to be appropriated for fiscal year 2019 by this Act for research, development, test, and evaluation, as specified in the funding tables in division D, $10,000,000 may be used to carry out this section.

**SEC. 227. HUMAN FACTORS MODELING AND SIMULATION ACTIVITIES.**

(a) ACTIVITIES REQUIRED.—The Secretary of Defense shall develop and provide for the carrying out of human factors modeling and simulation activities designed to do the following:

(1) Provide warfighters and civilians with personalized assessment, education, and training tools.

(2) Identify and implement effective ways to interface and team warfighters with machines.

(3) Result in the use of intelligent, adaptive augmentation to enhance decision making.

(4) Result in the development of techniques, technologies, and practices to mitigate critical stressors that impede warfighter and civilian protection, sustainment, and performance.

(b) PURPOSE.—The overall purpose of the activities shall be to accelerate research and development that enhances capabilities for human performance, human-systems integration, and training for the warfighter.

(c) PARTICIPANTS IN ACTIVITIES.—Participants in the activities may include the following:

(1) Elements of the Department of Defense engaged in science and technology activities.

(2) Program Executive Offices of the Department.

(3) Academia.

(4) The private sector.

(5) Such other participants as the Secretary considers appropriate.

**SEC. 228. EXPANSION OF MISSION AREAS SUPPORTED BY MECHANISMS FOR EXPEDITED ACCESS TO TECHNICAL TALENT AND EXPERTISE AT ACADEMIC INSTITUTIONS.**

Section 217(e) of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 10 U.S.C. 2358 note) is amended—

(1) by redesignating paragraph (23) as paragraph (27); and

(2) by inserting after paragraph (22) the following new paragraphs:

"(23) Space.

"(24) Infrastructure resilience.

"(25) Photonics.

"(26) Autonomy.".

**SEC. 229. ADVANCED MANUFACTURING ACTIVITIES.**

(a) DESIGNATION.—The Under Secretary of Defense for Acquisition and Sustainment and the Under Secretary of Defense for Research and Engineering shall jointly, in coordination with Secretaries of the military departments, establish at least one activity per military service to demonstrate advanced manufacturing techniques and capabilities at depot-level activities or military arsenal facilities of the military departments.

(b) PURPOSES.—The activities established pursuant to subsection (a) shall—

(1) support efforts to implement advanced manufacturing techniques and capabilities;

(2) identify improvements to sustainment methods for component parts and other logistics needs;

(3) identify and implement appropriate information security protections to ensure security of advanced manufacturing;

(4) aid in the procurement of advanced manufacturing equipment and support services;

(5) enhance partnerships between the defense industrial base and Department of Defense laboratories, academic institutions, and industry; and

(6) to the degree practicable, include an educational or training component to build an advanced manufacturing workforce.

(c) COOPERATIVE AGREEMENTS AND PARTNERSHIPS.—

(1) IN GENERAL.—The Under Secretaries may enter into a cooperative agreement and use public-private and public-public partnerships to facilitate development of advanced manufacturing techniques in support of the defense industrial base.

(2) REQUIREMENTS.—A cooperative agreement entered into under paragraph (1) and a partnership used under such paragraph shall facilitate—

(A) development and implementation of advanced manufacturing techniques and capabilities;

(B) appropriate sharing of information in the adaptation of advanced manufacturing, including technical data rights;

(C) implementation of appropriate information security protections into advanced manufacturing tools and techniques; and

(D) support of necessary workforce development.

(d) AUTHORITIES.—In carrying out this section, the Under Secretaries may use the following authorities:

(1) Section 2196 of title 10, United States Code, relating to the Manufacturing Engineering Education Program.

(2) Section 2368 of such title, relating to centers for science, technology, and engineering partnership.

(3) Section 2374a of such title, relating to prizes for advanced technology achievements.

(4) Section 2474 of such title, relating to centers of industrial and technical excellence.

(5) Section 2521 of such title, relating to the Manufacturing Technology Program.

(6) Section 12 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710a) and section 6305 of title 31, United States Code, relating to cooperative research and development agreements.

(7) Such other authorities as the Under Secretaries considers appropriate.

**SEC. 230. NATIONAL SECURITY INNOVATION ACTIVITIES.**

(a) ESTABLISHMENT.—The Under Secretary of Defense for Research and Engineering shall establish activities to develop interaction between the Department of Defense and the commercial technology industry and academia with regard to emerging hardware products and technologies with national security applications.

(b) ELEMENTS.—The activities required by subsection (a) shall include the following:

(1) Informing and encouraging private investment in specific hardware technologies of interest to future defense technology needs with unique national security applications.

(2) Funding research and technology development in hardware-intensive capabilities that private industry has not sufficiently supported to meet rapidly emerging defense and national security needs.

(3) Contributing to the development of policies, policy implementation, and actions to deter strategic acquisition of industrial and technical capabilities in the private sector by foreign entities that could potentially exclude companies from participating in the Department of Defense technology and industrial base.

(4) Identifying promising emerging technology in industry and academia for the Department of Defense for potential support or research and development cooperation.

(c) TRANSFER OF PERSONNEL AND RESOURCES.—

(1) IN GENERAL.—Subject to paragraph (2), the Under Secretary may transfer such personnel, resources, and authorities that are under the control of the Under Secretary as the Under Secretary considers appropriate to carry out the activities established under subsection (a) from other elements of the Department under the control of the Under Secretary or upon approval of the Secretary of Defense.

(2) CERTIFICATION.—The Under Secretary may only make a transfer of personnel, resources, or authorities under paragraph (1) upon certification by the Under Secretary that the activities established under paragraph (a) can attract sufficient private sector investment, has personnel with sufficient technical and management expertise, and has identified relevant technologies and systems for potential investment in order to carry out the activities established under subsection (a), independent of further government funding beyond this authorization.

(d) ESTABLISHMENT OF NONPROFIT ENTITY.—The Under Secretary may establish or fund a nonprofit entity to carry out the program activities under subsection (a).

(e) PLAN.—

(1) IN GENERAL.—Not later than one year after the date of the enactment of this Act, the Under Secretary shall submit to the congressional defense committees a detailed plan to carry out this section.

(2) ELEMENTS.—The plan required by paragraph (1) shall include the following:

(A) A description of the additional authorities needed to carry out the activities set forth in subsection (b).

(B) Plans for transfers under subsection (c), including plans for private fund-matching and investment mechanisms, oversight, treatment of rights relating to technical data developed, and relevant dates and goals of such transfers.

(C) Plans for attracting the participation of the commercial technology industry and academia and how those plans fit into the current Department of Defense research and engineering enterprise.

(f) AUTHORITIES.—In carrying out this section, the Under Secretary may use the following authorities:

(1) Section 1711 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91), relating to a pilot program on strengthening manufacturing in the defense industrial base.

(2) Section 1599g of title 10 of the United States Code, relating to public-private talent exchanges.

(3) Section 2368 of such title, relating to Centers for Science, Technology, and Engineering Partnerships.

(4) Section 2374a of such title, relating to prizes for advanced technology achievements.

(5) Section 2474 of such title, relating to Centers of Industrial and Technical Excellence.

(6) Section 2521 of such title, relating to the Manufacturing Technology Program.

(7) Subchapter VI of chapter 33 of title 5, United States Code, relating to assignments to and from States.

(8) Chapter 47 of such title, relating to personnel research programs and demonstration projects.

(9) Section 12 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3710a) and section 6305 of title 31, United States Code, relating to cooperative research and development agreements.

(10) Such other authorities as the Under Secretary considers appropriate.

(g) NOTICE REQUIRED.—Not later than 15 days before the date on which the Under Secretary first exercises the authority granted under subsection (d) and not later than 15 days before the date on which the Under Secretary first obligates or expends any amount authorized under subsection (h), the Under Secretary shall notify the congressional defense committees of such exercise, obligation, or expenditure, as the case may be.

(h) FUNDING.—Of the amount authorized to be appropriated for fiscal year 2019 for the Department of Defense by section 201 and subject to the availability of appropriations, up to $75,000,000 may be available to carry out this section.

**SEC. 231. PARTNERSHIP INTERMEDIARIES FOR PROMOTION OF DEFENSE RESEARCH AND EDUCATION.**

Section 2368 of title 10, United States Code, is amended—

(1) by redesignating subsections (f) and (g) as subsections (g) and (h), respectively; and

(2) by inserting after subsection (e) the following new subsection (f):

"(f) USE OF PARTNERSHIP INTERMEDIARIES TO PROMOTE DEFENSE RESEARCH AND EDUCATION.—(1) Subject to the approval of the Secretary or the head of the another department or agency

of the Federal Government concerned, the Director of a Center may enter into a contract, memorandum of understanding or other transition with a partnership intermediary that provides for the partnership intermediary to perform services for the Department of Defense that increase the likelihood of success in the conduct of cooperative or joint activities of the Center with industry or academic institutions.

"(2) In this subsection, the term 'partnership intermediary' means an agency of a State or local government, or a nonprofit entity owned in whole or in part by, chartered by, funded in whole or in part by, or operated in whole or in part by or on behalf of a State or local government, that assists, counsels, advises, evaluates, or otherwise cooperates with industry or academic institutions that need or can make demonstrably productive use of technology-related assistance from a Center.".

**SEC. 232. LIMITATION ON USE OF FUNDS FOR SURFACE NAVY LASER WEAPON SYSTEM.**

(a) LIMITATION.—None of the funds authorized to be appropriated or otherwise made available by this Act may be used to exceed, in fiscal year 2019, a procurement quantity of one Surface Navy Laser Weapon System, also known as the High Energy Laser and Integrated Optical-dazzler with Surveillance (HELIOS), unless the Secretary of the Navy submits to the congressional defense committees a report on such system with the elements set forth in subsection (b).

(b) ELEMENTS.—The elements set forth in this subsection are, with respect to the system described in subsection (a), the following:

(1) A document setting forth the requirements for the system, including desired performance characteristics.

(2) An acquisition plan that includes the following:

(A) A program schedule to accomplish design completion, technology maturation, risk reduction, and other activities, including dates of key design reviews (such as Preliminary Design Review and Critical Design Review) and program initiation decision (such as Milestone B) if applicable.

(B) A contracting strategy, including requests for proposals, the extent to which contracts will be competitively awarded, option years, option quantities, option prices, and ceiling prices.

(C) The fiscal years of procurement and delivery for each engineering development model, prototype, or similar unit planned to be acquired.

(D) A justification for the fiscal years of procurement and delivery for each engineering development model, prototype, or similar unit planned to be acquired.

(3) A test plan and schedule sufficient to achieve operational effectiveness and operational suitability determinations (such as Early Operational Capability and Initial Operational Capability) related to the requirements set forth in paragraph (1).

(4) Associated funding and item quantities, disaggregated by fiscal year and appropriation, requested in the Fiscal Year 2019 Future Years Defense Program.

(5) An estimate of the acquisition costs, including the total costs for procurement, research, development, test, and evaluation.

**SEC. 233. EXPANSION OF COORDINATION REQUIREMENT FOR SUPPORT FOR NATIONAL SECURITY INNOVATION AND ENTREPRENEURIAL EDUCATION.**

Section 225(e) of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 10 U.S.C. 2359 note) is amended by adding at the end the following new paragraphs:

"(16) The National Security Technology Accelerator.

"(17) The I-Corps Program.".

**SEC. 234. DEFENSE QUANTUM INFORMATION SCIENCE AND TECHNOLOGY RESEARCH AND DEVELOPMENT PROGRAM.**

(a) ESTABLISHMENT.—The Secretary of Defense shall carry out a quantum information science and technology research and development program.

(b) PURPOSES.—The purposes of the program required by subsection (a) are as follows:

(1) To ensure global superiority of the United States in quantum information science necessary for meeting national security requirements.

(2) To coordinate all quantum information science and technology research and development within the Department of Defense and to provide for interagency cooperation and collaboration on quantum information science and technology research and development between the Department of Defense and other departments and agencies of the United States and appropriate private sector entities that are involved in quantum information science and technology research and development.

(3) To develop and manage a portfolio of fundamental and applied quantum information science and technology and engineering research initiatives that is stable, consistent, and balanced across scientific disciplines.

(4) To accelerate the transition and deployment of technologies and concepts derived from quantum information science and technology research and development into the Armed Forces, and to establish policies, procedures, and standards for measuring the success of such efforts.

(5) To collect, synthesize, and disseminate critical information on quantum information science and technology research and development.

(6) To establish and support appropriate research, innovation, and industrial base, including facilities and infrastructure, to support the needs of Department of Defense missions and systems related to quantum information science and technology.

(c) ADMINISTRATION.—In carrying out the program required by subsection (a), the Secretary shall act through the Under Secretary of Defense for Research and Engineering, who shall supervise the planning, management, and coordination of the program. The Under Secretary, in consultation with the Secretaries of the military departments and the heads of participating Defense Agencies and other departments and agencies of the United States, shall—

(1) prescribe a set of long-term challenges and a set of specific technical goals for the program, including—

(A) optimization of analysis of national security data sets;

(B) development of defense related quantum computing algorithms;

(C) design of new materials and molecular functions;

(D) secure communications and cryptography, including development of quantum communications protocols;

(E) quantum sensing and metrology;

(F) development of mathematics relating to quantum enhancements to sensing, communications, and computing; and

(G) processing and manufacturing of low-cost, robust, and reliable quantum information science and technology-enabled devices and systems;

(2) develop a coordinated and integrated research and investment plan for meeting the near-, mid-, and long-term challenges with definitive milestones while achieving the specific technical goals that builds upon the Department's increased investment in quantum information science and technology research and development, commercial sector and global investments, and other United States Government investments in the quantum sciences;

(3) not later than 180 days after the date of the enactment of this Act, develop and continuously update guidance, including classification and data management plans for defense-related quantum information science and technology activities, and policies for control of personnel participating on such activities to minimize the effects of loss of intellectual property in basic and applied quantum science and information considered sensitive to the leadership of the United States in the field of quantum information science and technology; and

(4) develop memoranda of agreement, joint funding agreements, and other cooperative arrangements necessary for meeting the long-term challenges and achieving the specific technical goals.

(d) REPORT.—

(1) IN GENERAL.—Not later than December 31, 2020, the Secretary shall submit to the congressional defense committees a report on the program, in both classified and unclassified format.

(2) ELEMENTS.—The report required by paragraph (1) shall include the following:

(A) A description of the knowledge-base of the Department with respect to quantum sciences, plans to defend against quantum based attacks, and any plans of the Secretary to enhance such knowledge-base.

(B) A plan that describes how the Secretary intends to use quantum sciences for military applications and to meet other needs of the Department.

(C) An assessment of the efforts of foreign powers to use quantum sciences for military applications and other purposes.

(D) A description of activities undertaken consistent with this section, including funding for activities consistent with the section.

(E) Such other matters as the Secretary considers appropriate.

**SEC. 235. JOINT DIRECTED ENERGY TEST ACTIVITIES.**

(a) TEST ACTIVITIES.—The Under Secretary of Defense for Research and Engineering shall, in the Under Secretary's capacity as the official with principal responsibility for the development and demonstration of directed energy weapons for the Department of Defense pursuant to section 219(a)(1) of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114–328; 10 U.S.C. 2431 note), develop, establish, and coordinate directed energy testing activities adequate to ensure the achievement by the Department of Defense of goals of the Department for developing and deploying directed energy systems to match national security needs.

(b) ELEMENTS.—The activity established under subsection (a) shall include the following:

(1) The High Energy Laser System Test Facility of the Army Test and Evaluation Command.

(2) Such other test resources and activities as the Under Secretary may designate for purposes of this section.

(c) DESIGNATION.—The test activities established under subsection (a) shall be considered part of the Major Range and Test Facility Base (as defined in 196(i) of title 10, United States Code).

(d) PRIORITIZATION OF EFFORT.—In developing and coordinating testing activities pursuant to subsection (a), the Under Secretary shall prioritize efforts consistent with the following:

(1) Paragraphs (2) through (5) of section 219(a) of the National Defense Authorization Act for Fiscal Year 2017 (10 U.S.C. 2431 note).

(2) Enabling the standardized collection and evaluation of testing data to establish testing references and benchmarks.

(3) Concentrating sufficient personnel expertise of directed energy weapon systems in order to validate the effectiveness of new weapon systems against a variety of targets.

(4) Consolidating modern state-of-the-art testing infrastructure including telemetry, sensors, and optics to support advanced technology testing and evaluation.

(5) Formulating a joint lethality or vulnerability information repository that can be accessed by any of the military departments of Defense Agencies, similar to a Joint Munitions Effectiveness Manuals (JMEMs).

(6) Reducing duplication of directed energy weapon testing.

(7) Ensuring that an adequate workforce and adequate testing facilities are maintained to support missions of the Department of Defense.

**SEC. 236. REQUIREMENT FOR ESTABLISHMENT OF ARRANGEMENTS FOR EXPEDITED ACCESS TO TECHNICAL TALENT AND EXPERTISE AT ACADEMIC INSTITUTIONS TO SUPPORT DEPARTMENT OF DEFENSE MISSIONS.**

(a) IN GENERAL.—Subsection (a)(1) of section 217 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 10 U.S.C. 2358 note) is amended by striking "and each secretary of a military department may establish one or more" and inserting "shall, acting through the secretaries of the military departments, establish not fewer than three".

(b) EXTENSION.—Subsection (f) of such section is amended by striking "September 30, 2020" and inserting "September 30, 2022".

**SEC. 237. AUTHORITY FOR JOINT DIRECTED ENERGY TRANSITION OFFICE TO CONDUCT RESEARCH RELATING TO HIGH POWERED MICROWAVE CAPABILITIES.**

Section 219(b)(3) of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114–328; 10 U.S.C. 2431 note) is amended by inserting ", including high-powered microwaves," after "energy systems and technologies".

**SEC. 238. JOINT ARTIFICIAL INTELLIGENCE RESEARCH, DEVELOPMENT, AND TRANSITION ACTIVITIES.**

(a) ESTABLISHMENT.—

(1) IN GENERAL.—The Secretary of Defense shall establish a set of activities within the Department of Defense to coordinate the efforts of the Department to develop, mature, and transition artificial intelligence technologies into operational use.

(2) EMPHASIS.—The set of activities established under paragraph (1) shall apply artificial intelligence and machine learning solutions to operational problems and coordinate activities involving artificial intelligence and artificial intelligence enabled capabilities within the Department.

(b) DESIGNATION.—Not later than one year after the date of the enactment of this Act, the Secretary shall designate a senior official of the Department with principal responsibility for the coordination of activities relating to the development and demonstration of artificial intelligence and machine learning for the Department.

(c) DUTIES.—The duties of the official designated under subsection (b) shall include the following:

(1) STRATEGIC PLAN.—Developing a detailed strategic plan to develop, mature, adopt, and transition artificial intelligence technologies into operational use. Such plan shall include the following:

(A) A strategic roadmap for the identification and coordination of the development and fielding of artificial intelligence technologies and key enabling capabilities.

(B) The continuous evaluation and adaptation of relevant artificial intelligence capabilities developed both inside the Department and in other organizations for military missions and business operations.

(2) ACCELERATION OF DEVELOPMENT AND FIELDING OF ARTIFICIAL INTELLIGENCE.—To the degree practicable, the designated official shall—

(A) use the flexibility of regulations, personnel, acquisition, partnerships with industry and academia, or other relevant policies of the Department to accelerate the development and fielding of artificial intelligence capabilities;

(B) ensure engagement with defense and private industries, research universities, and unaffiliated, nonprofit research institutions;

(C) provide technical advice and support to entities in the Department and the military departments to optimize the use of artificial intelligence and machine learning technologies to meet Department missions;

(D) support the development of requirements for artificial intelligence capabilities that address the highest priority capability gaps of the Department and technical feasibility;

(E) develop and support capabilities for technical analysis and assessment of threat capabilities based on artificial intelligence;

(F) ensure that the Department has appropriate workforce and capabilities at laboratories, test ranges, and within the organic defense industrial base to support the artificial intelligence capabilities and requirements of the Department;

(G) develop classification guidance for all artificial intelligence related activities of the Department;

(H) work with appropriate officials to develop appropriate ethical, legal, and other policies for the Department governing the development and use of artificial intelligence enabled systems and technologies in operational situations; and

(I) ensure—

(i) that artificial intelligence programs of each military department and of the Defense Agencies are consistent with the priorities identified under this section; and

(ii) appropriate coordination of artificial intelligence activities of the Department with interagency, industry, and international efforts relating to artificial intelligence, including relevant participation in standards setting bodies.

(3) GOVERNANCE AND OVERSIGHT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING POLICY.—Regularly convening appropriate officials across the Department—

(A) to integrate the functional activities of the organizations and elements of the Department with respect to artificial intelligence and machine learning;

(B) to ensure there are efficient and effective artificial intelligence and machine learning capabilities throughout the Department; and

(C) to develop and continuously improve research, innovation, policy, joint processes, and procedures to facilitate the development, acquisition, integration, advancement, oversight, and sustainment of artificial intelligence and machine learning throughout the Department.

(d) ACCESS TO INFORMATION.—The Secretary shall ensure that the official designated under subsection (b) has access to such information on programs and activities of the military departments and other Defense Agencies as the Secretary considers appropriate to carry out the coordination described in subsection (b) and the duties set forth in subsection (c).

(e) STUDY ON ARTIFICIAL INTELLIGENCE TOPICS.—

(1) IN GENERAL.—Not later than one year after the date of the enactment of this Act, the official designated under subsection (b) shall—

(A) complete a study on past and current advances in artificial intelligence and the future of the discipline, including the methods and means necessary to advance the development of the discipline, to comprehensively

address the national security needs and requirements of the Department; and

(B) submit to the congressional defense committees a report on the findings of the designated official with respect to the study completed under subparagraph (A).

(2) CONSULTATION WITH EXPERTS.—In conducting the study required by paragraph (1)(A), the designated official shall consult with experts within the Department, other Federal agencies, academia, any advisory committee established by the Secretary that the Secretary determines appropriate based on the duties of the advisory committee and the expertise of its members, and the commercial sector, as the Secretary considers appropriate.

(3) ELEMENTS.—The study required by paragraph (1)(A) shall include the following:

(A) A comprehensive and national-level review of—

(i) advances in artificial intelligence, machine learning, and associated technologies relevant to the needs of the Department and the Armed Forces; and

(ii) the competitiveness of the Department in artificial intelligence, machine learning, and such technologies.

(B) Near-term actionable recommendations to the Secretary for the Department to secure and maintain technical advantage in artificial intelligence, including ways—

(i) to more effectively organize the Department for artificial intelligence;

(ii) to educate, recruit, and retain leading talent; and

(iii) to most effectively leverage investments in basic and advanced research and commercial progress in these technologies.

(C) Recommendations on the establishment of Departmentwide data standards and the provision of incentives for the sharing of open training data, including those relevant for research into systems that integrate artificial intelligence and machine learning with human teams.

(D) Recommendations for engagement by the Department with relevant agencies that will be involved with artificial intelligence in the future.

(E) Recommendations for legislative action relating to artificial intelligence, machine learning, and associated technologies, including recommendations to more effectively fund and organize the Department.

(f) DELINEATION OF DEFINITION OF ARTIFICIAL INTELLIGENCE.—Not later than one year after the date of the enactment of this Act, the Secretary shall delineate a definition of the term "artificial intelligence" for use within the Department.

(g) ARTIFICIAL INTELLIGENCE DEFINED.—In this section, the term "artificial intelligence" includes the following:

(1) Any artificial system that performs tasks under varying and unpredictable circumstances without significant human oversight, or that can learn from experience and improve performance when exposed to data sets.

(2) An artificial system developed in computer software, physical hardware, or other context that solves tasks requiring

human-like perception, cognition, planning, learning, communication, or physical action.

(3) An artificial system designed to think or act like a human, including cognitive architectures and neural networks.

(4) A set of techniques, including machine learning, that is designed to approximate a cognitive task.

(5) An artificial system designed to act rationally, including an intelligent software agent or embodied robot that achieves goals using perception, planning, reasoning, learning, communicating, decision making, and acting.

## Subtitle C—Reports and Other Matters

### SEC. 241. REPORT ON SURVIVABILITY OF AIR DEFENSE ARTILLERY.

(a) REPORT REQUIRED.—Not later than March 1, 2019, the Secretary of the Army shall submit to the Committees on Armed Services of the Senate and the House of Representatives a report on the efforts of the Army to improve the survivability of air defense artillery, with a particular focus on the efforts of the Army to improve passive and active nonkinetic capabilities and training with respect to such artillery.

(b) ELEMENTS.—The report required under subsection (a) shall include the following:

(1) An analysis of the utility of relevant passive and active non-kinetic integrated air and missile defense capabilities, including tactical mobility, new passive and active sensors, signature reduction, concealment, and deception systems, and electronic warfare and high-powered radio frequency systems.

(2) An analysis of the utility of relevant active kinetic capabilities, such as a new, long-range counter-maneuvering threat missile and additional indirect fire protection capability units to defend Patriot and Terminal High Altitude Area Defense batteries.

(c) FORM OF REPORT.—The report required under subsection (a) shall be submitted in unclassified form, but may contain a classified annex.

### SEC. 242. T–45 AIRCRAFT PHYSIOLOGICAL EPISODE MITIGATION ACTIONS.

Section 1063(b) of the National Defense Authorization Act for Fiscal Year 2018 (131 Stat. 1576; Public Law 115–91) is amended by adding at the end the following new paragraphs:

"(5) A list of all modifications to the T–45 aircraft and associated ground equipment carried out during fiscal years 2017 through 2019 to mitigate the risk of physiological episodes among T–45 crewmembers.

"(6) The results achieved by the modifications listed pursuant to paragraph (5), as determined by relevant testing and operational activities.

"(7) The cost of the modifications listed pursuant to paragraph (5).

"(8) Any plans of the Navy for future modifications to the T–45 aircraft that are intended to mitigate the risk of physiological episodes among T–45 crewmembers.".

**SEC. 243. REPORT ON EFFORTS OF THE AIR FORCE TO MITIGATE PHYSIOLOGICAL EPISODES AFFECTING AIRCRAFT CREWMEMBERS.**

(a) REPORT REQUIRED.—Not later than March 1, 2019, the Secretary of the Air Force shall submit to the congressional defense committees a report on all efforts of the Air Force to reduce the occurrence of, and mitigate the risk posed by, physiological episodes affecting crewmembers of covered aircraft.

(b) ELEMENTS.—The report required under subsection (a) shall include—

(1) information on the rate of physiological episodes affecting crewmembers of covered aircraft;

(2) a description of the specific actions carried out by the Air Force to address such episodes, including a description of any upgrades or other modifications made to covered aircraft to address such episodes;

(3) schedules and cost estimates for any upgrades or modifications identified under paragraph (3); and

(4) an explanation of any organizational or other changes to the Air Force carried out to address such physiological episodes.

(c) COVERED AIRCRAFT DEFINED.—In this section, the term "covered aircraft" means—

(1) F–35A aircraft of the Air Force;

(2) T–6A aircraft of the Air Force; and

(3) any other aircraft of the Air Force as determined by the Secretary of the Air Force.

**SEC. 244. REPORT ON DEFENSE INNOVATION UNIT EXPERIMENTAL.**

Not later than May 1, 2019, the Under Secretary of Defense for Research and Engineering shall submit to the congressional defense committees a report on Defense Innovation Unit Experimental (in this section referred to as the "Unit"). Such a report shall include the following:

(1) The integration of the Unit into the broader Department of Defense research and engineering community to coordinate and de-conflict activities of the Unit with similar activities of the military departments, Defense Agencies, Department of Defense laboratories, the Defense Advanced Research Project Agency, the Small Business Innovation Research Program, and other entities.

(2) The metrics used to measure the effectiveness of the Unit and the results of these metrics.

(3) The number and types of transitions by the Unit to the military departments or fielded to the warfighter.

(4) The impact of the Unit's initiatives, outreach, and investments on Department of Defense access to technology leaders and technology not otherwise accessible to the Department including—

(A) identification of—

(i) the number of non-traditional defense contractors with Department of Defense contracts or other transactions resulting directly from the Unit's initiatives, investments, or outreach; and

(ii) the number of traditional defense contractors with contracts or other transactions resulting directly from the Unit's initiatives;

(B) the number of innovations delivered into the hands of the warfighter; and

(C) how the Department is notifying its internal components about participation in the Unit.

(5) The workforce strategy of the Unit, including whether the Unit has appropriate personnel authorities to attract and retain talent with technical and business expertise.

(6) How the Department of Defense is documenting and institutionalizing lessons learned and best practices of the Unit to alleviate the systematic problems with technology access and timely contract or other transaction execution.

(7) An assessment of management and bureaucratic challenges to the effective and efficient execution of the Unit's missions, especially with respect to contracting and personnel management.

**SEC. 245. MODIFICATION OF FUNDING CRITERIA UNDER HISTORICALLY BLACK COLLEGES AND UNIVERSITIES AND MINORITY INSTITUTIONS PROGRAM.**

Section 2362(d) of title 10, United States Code, is amended—

(1) in the subsection heading, by striking "PRIORITY" and inserting "CRITERIA"; and

(2) by striking "give priority in providing" and inserting "limit".

**SEC. 246. REPORT ON OA–X LIGHT ATTACK AIRCRAFT APPLICABILITY TO PARTNER NATION SUPPORT.**

(a) REPORT REQUIRED.—Not later than February 1, 2019, the Secretary of the Air Force shall submit to the congressional defense committees a report on the OA–X light attack aircraft experiment and how the program incorporates partner nation requirements.

(b) ELEMENTS.—The report under subsection (a) shall include a description of—

(1) how the OA–X light attack experiment will support partner nations' low-cost counter terrorism light attack capability;

(2) the extent to which the attributes of affordability, interoperability, sustainability, and simplicity of maintenance and operations are included in the requirements for the OA–X; and

(3) how Federal Aviation Administration certification and a reasonable path for military type certifications for commercial derivative aircraft are factored into foreign military sales for a partner nation.

**SEC. 247. REPORTS ON COMPARATIVE CAPABILITIES OF ADVERSARIES IN KEY TECHNOLOGY AREAS.**

(a) IN GENERAL.—Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense shall, in coordination with the Director of the Defense Intelligence Agency, submit to the appropriate committees of Congress a set of classified reports that set forth a direct comparison between the capabilities of the United States in emerging technology areas and the capabilities of adversaries of the United States in such areas.

(b) ELEMENTS.—The reports required by subsection (a) shall include, for each technology area covered, the following:

(1) An evaluation of spending by the United States and adversaries on such technology.

(2) An evaluation of the quantity and quality of research on such technology.

(3) An evaluation of the test infrastructure and workforce supporting such technology.

(4) An assessment of the technological progress of the United States and adversaries on such technology.

(5) Descriptions of timelines for operational deployment of such technology.

(6) An assessment of the intent or willingness of adversaries to use such technology.

(c) TECHNICAL AREAS.—The Secretary shall ensure that the reports submitted under subsection (a) cover the following:

(1) Hypersonics.

(2) Artificial intelligence.

(3) Quantum information science.

(4) Directed energy weapons.

(5) Such other emerging technical areas as the Secretary considers appropriate.

(d) COORDINATION.—The Secretary shall prepare the reports in coordination with other appropriate officials of the intelligence community and with such other partners in the technology areas covered by the reports as the Secretary considers appropriate.

(e) APPROPRIATE COMMITTEES OF CONGRESS DEFINED.—In this section, the term "appropriate committees of Congress" means—

(1) the Committee on Armed Services and the Select Committee on Intelligence of the Senate; and

(2) the Committee on Armed Services and the Permanent Select Committee on Intelligence of the House of Representatives.

**SEC. 248. REPORT ON ACTIVE PROTECTION SYSTEMS FOR ARMORED COMBAT AND TACTICAL VEHICLES.**

(a) REPORT REQUIRED.—Not later than 60 days after the date of the enactment of this Act, the Secretary of the Army shall submit to the Committees on Armed Services of the Senate and the House of Representatives a report on technologies related to active protection systems (APS) for armored combat and tactical vehicles.

(b) CONTENTS.—The report required by subsection (a) shall include the following:

(1) With respect to the active protection systems that the Army has recently tested on the M1A2 Abrams, the M2A3 Bradley, and the STRYKER, the following:

(A) An assessment of the effectiveness of such systems.

(B) Plans of the Secretary to further test such systems.

(C) Proposals for future development of such systems.

(D) A timeline for fielding such systems.

(2) Plans for how the Army will incorporate active protection systems into new armored combat and tactical vehicle designs, such as Mobile Protection Firepower (MPF), Armored Multi-Purpose Vehicle (AMPV), and Next Generation Combat Vehicle (NGCV).

**SEC. 249. NEXT GENERATION COMBAT VEHICLE.**

(a) PROTOTYPE.—The Secretary of the Army shall take appropriate actions to ensure that all necessary resources are planned

and programmed for accelerated prototyping, component development, testing, or acquisition for the Next Generation Combat Vehicle (NGCV).

(b) REPORT.—

(1) IN GENERAL.—Not later than March 1, 2019, the Secretary shall submit to the Committees on Armed Services of the Senate and the House of Representatives a report on the development of the Next Generation Combat Vehicle.

(2) ANALYSIS.—

(A) IN GENERAL.—The report required by paragraph (1) shall include a thorough analysis of the requirements of the Next Generation Combat Vehicle.

(B) RELEVANCE TO NATIONAL DEFENSE STRATEGY.—In carrying out subparagraph (A), the Secretary shall ensure that the requirements are relevant to the most recently published National Defense Strategy.

(C) THREATS AND TERRAIN.—The Secretary shall ensure that the analysis includes consideration of threats and terrain.

(D) COMPONENT TECHNOLOGIES.—The Secretary shall ensure that the analysis includes consideration of the latest enabling component technologies developed by the Tank Automotive, Research, Development, Engineering Center of the Army that have the potential to dramatically change basic combat vehicle design and improve lethality, protection, mobility, range, and sustainment.

(c) LIMITATION.—Of the funds authorized to be appropriated for fiscal year 2019 by section 201 and available for research, development, testing, and evaluation, Army, for the Next Generation Combat Vehicle, not more than 90 percent may be obligated or expended until the Secretary submits the report required by subsection (b).

**SEC. 250. MODIFICATION OF REPORTS ON MECHANISMS TO PROVIDE FUNDS TO DEFENSE LABORATORIES FOR RESEARCH AND DEVELOPMENT OF TECHNOLOGIES FOR MILITARY MISSIONS.**

Subsection (c) of section 2363 of title 10, United States Code, is amended to read as follows:

"(c) RELEASE AND DISSEMINATION OF INFORMATION ON CONTRIBUTIONS FROM USE OF AUTHORITY TO MILITARY MISSIONS.—

"(1) COLLECTION OF INFORMATION.—The Secretary shall establish and maintain mechanisms for the continuous collection of information on achievements, best practices identified, lessons learned, and challenges arising in the exercise of the authority in this section.

"(2) RELEASE OF INFORMATION.—The Secretary shall establish and maintain mechanisms as follows:

"(A) Mechanisms for the release to the public of information on achievements and best practices described in paragraph (1) in unclassified form.

"(B) Mechanisms for dissemination to appropriate civilian and military officials of information on achievements and best practices described in paragraph (1) in classified form.".

**SEC. 251. BRIEFINGS ON MOBILE PROTECTED FIREPOWER AND FUTURE VERTICAL LIFT PROGRAMS.**

(a) IN GENERAL.—Not later than March 1, 2019, the Secretary of the Army shall provide a briefing to the Committee on Armed Services of the Senate and the Committee on Armed Services of the House of Representatives on the requirements of the Army for Mobile Protected Firepower (MPF) and Future Vertical Lift (FVL).

(b) CONTENTS.—The briefing provided pursuant to subsection (a) shall include the following:

(1) With respect to the Mobile Protected Firepower program, the following:

(A) An explanation of how Mobile Protected Firepower could survive against the effects of anti-armor and anti-aircraft networks established within anti-access, area-denial defenses.

(B) An explanation of how Mobile Protected Firepower would improve offensive overmatch against a peer adversary.

(C) Details regarding the total number of Mobile Protected Firepower systems needed by the Army.

(D) An explanation of how the Mobile Protected Firepower system will be logistically supported within light formations.

(E) Plans to integrate active protection systems into the designs of the Mobile Protected Firepower program.

(2) With respect to the Future Vertical Lift program, the following:

(A) An explanation of how Future Vertical Lift could survive against the effects of anti-aircraft networks established within anti-access, area-denial defenses.

(B) An explanation of how Future Vertical Lift would improve offensive overmatch against a peer adversary.

(C) A review of the doctrine, organization, training, materiel, leadership, education, personnel, and facilities applicable to determine the total number of Future Vertical Lift Capability Set 1 or Future Attack Reconnaissance Aircraft (FARA), required by the Army.

(D) An implementation plan for the establishment of Future Vertical Lift, including a timeline for achieving initial and full operational capability.

(E) A description of the budget requirements for Future Vertical Lift to reach full operational capability, including an identification and cost of any infrastructure and equipment requirements.

(F) A detailed list of all analysis used to determine the priority of Future Vertical Lift and which programs were terminated, extended, de-scoped, or delayed in order to fund Future Vertical Lift Capability Set 1 or Future Attack Reconnaissance Aircraft in the Future Year's Defense Plan.

(G) An assessment of the analysis of alternatives on the Future Vertical Lift Capability Set 3 program.

(H) An identification of any additional authorities that may be required for achieving full operational capability of Future Vertical Lift.

(I) Any other matters deemed relevant by the Secretary.

**SEC. 252. IMPROVEMENT OF THE AIR FORCE SUPPLY CHAIN.**

(a) IN GENERAL.—The Assistant Secretary of the Air Force for Acquisition, Technology, and Logistics may use funds described in subsection (b) as follows:

(1) For nontraditional technologies and sustainment practices (such as additive manufacturing, artificial intelligence, predictive maintenance, and other software-intensive and software-defined capabilities) to—

(A) increase the availability of aircraft to the Air Force; and

(B) decrease backlogs and lead times for the production of parts for such aircraft.

(2) To advance the qualification, certification, and integration of additive manufacturing into the Air Force supply chain.

(3) To otherwise identify and reduce supply chain risk for the Air Force.

(4) To define workforce development requirements and training for personnel who implement and support additive manufacturing for the Air Force at the warfighter, end-item designer and equipment operator, and acquisition officer levels.

(b) FUNDING.—Of the amounts authorized to be appropriated for fiscal year 2019 by section 201 for research, development, test, and evaluation for the Air Force and available for Tech Transition Program (Program Element (0604858F)), up to $42,800,000 may be available as described in subsection (a).

**SEC. 253. REVIEW OF GUIDANCE ON BLAST EXPOSURE DURING TRAINING.**

(a) INITIAL REVIEW.—Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense shall review the decibel level exposure, concussive effects exposure, and the frequency of exposure to heavy weapons fire of an individual during training exercises to establish appropriate limitations on such exposures.

(b) ELEMENTS.—The review required by subsection (a) shall take into account current data and evidence on the cognitive effects of blast exposure and shall include consideration of the following:

(1) The impact of exposure over multiple successive days of training.

(2) The impact of multiple types of heavy weapons being fired in close succession.

(3) The feasibility of cumulative annual or lifetime exposure limits.

(4) The minimum safe distance for observers and instructors.

(c) UPDATED TRAINING GUIDANCE.—Not later than 180 days after the date of the completion of the review under subsection (a), each Secretary of a military department shall update any relevant training guidance to account for the conclusions of the review.

(d) UPDATED REVIEW.—

(1) IN GENERAL.—Not later than two years after the initial review conducted under subsection (a), and not later than two years thereafter, the Secretary of Defense shall conduct an updated review under such subsection, including consideration

of the matters set forth under subsection (b), and update training guidance under subsection (c).

(2) CONSIDERATION OF NEW RESEARCH AND EVIDENCE.—Each updated review conducted under paragraph (1) shall take into account new research and evidence that has emerged since the previous review.

(e) BRIEFING REQUIRED.—The Secretary of Defense shall brief the Committees on Armed Services of the Senate and the House of Representatives on a summary of the results of the initial review under subsection (a), each updated review conducted under subsection (d), and any updates to training guidance and procedures resulting from any such review or updated review.

**SEC. 254. COMPETITIVE ACQUISITION STRATEGY FOR BRADLEY FIGHTING VEHICLE TRANSMISSION REPLACEMENT.**

(a) PLAN REQUIRED.—The Secretary of the Army shall develop a strategy to competitively procure a new transmission for the Bradley Fighting Vehicle family of vehicles.

(b) ADDITIONAL STRATEGY REQUIREMENTS.—The plan required by subsection (a) shall include the following:

(1) An analysis of the potential cost savings and performance improvements associated with developing or procuring a new transmission common to the Bradley Fighting Vehicle family of vehicles, including the Armored Multipurpose Vehicle and the Paladin Integrated Management artillery system.

(2) A plan to use full and open competition as required by the Federal Acquisition Regulation.

(c) TIMELINE.—Not later than February 15, 2019, the Secretary of the Army shall submit to the congressional defense committees the strategy developed under subsection (a).

(d) LIMITATION.—None of the funds authorized to be appropriated for fiscal year 2019 by this Act for Weapons and Tracked Combat Vehicles, Army, may be obligated or expended to procure a Bradley Fighting Vehicle replacement transmission until the date that is 30 days after the date on which the Secretary of the Army submits to the congressional defense committees the plan required by subsection (a).

**SEC. 255. INDEPENDENT ASSESSMENT OF ELECTRONIC WARFARE PLANS AND PROGRAMS.**

(a) AGREEMENT.—

(1) IN GENERAL.—The Secretary of Defense shall seek to enter into an agreement with the private scientific advisory group known as "JASON" to perform the services covered by this section.

(2) TIMING.—The Secretary shall seek to enter into the agreement described in paragraph (1) not later than 120 days after the date of the enactment of this Act.

(b) INDEPENDENT ASSESSMENT.—Under an agreement between the Secretary and JASON under this section, JASON shall—

(1) assess the strategies, programs, order of battle, and doctrine of the Department of Defense related to the electronic warfare mission area and electromagnetic spectrum operations;

(2) assess the strategies, programs, order of battle, and doctrine of potential adversaries, such as China, Iran, and the Russian Federation, related to the same;

(3) develop recommendations for improvements to the strategies, programs, and doctrine of the Department of Defense

in order to enable the United States to achieve and maintain superiority in the electromagnetic spectrum in future conflicts; and

(4) develop recommendations for the Secretary, Congress, and such other Federal entities as JASON considers appropriate, including recommendations for—

(A) closing technical, policy, or resource gaps;

(B) improving cooperation and appropriate integration within the Department of Defense entities;

(C) improving cooperation between the United States and other countries and international organizations as appropriate; and

(D) such other important matters identified by JASON that are directly relevant to the strategies of the Department of Defense described in paragraph (3).

(c) LIAISONS.—The Secretary shall appoint appropriate liaisons to JASON to support the timely conduct of the services covered by this section.

(d) MATERIALS.—The Secretary shall provide access to JASON to materials relevant to the services covered by this section, consistent with the protection of sources and methods and other critically sensitive information.

(e) CLEARANCES.—The Secretary shall ensure that appropriate members and staff of JASON have the necessary clearances, obtained in an expedited manner, to conduct the services covered by this section.

(f) REPORT.—Not later than October 1, 2019, the Secretary shall submit to the congressional defense committees a report on—

(1) the findings of JASON with respect to the assessments carried out under subsection (b); and

(2) the recommendations developed by JASON pursuant to such subsection.

(g) ALTERNATE CONTRACT SCIENTIFIC ORGANIZATION.—

(1) IN GENERAL.—If the Secretary is unable within the period prescribed in paragraph (2) of subsection (a) to enter into an agreement described in paragraph (1) of such subsection with JASON on terms acceptable to the Secretary, the Secretary shall seek to enter into such agreement with another appropriate scientific organization that—

(A) is not part of the government; and

(B) has expertise and objectivity comparable to that of JASON.

(2) TREATMENT.—If the Secretary enters into an agreement with another organization as described in paragraph (1), any reference in this section to JASON shall be treated as a reference to the other organization.

# TITLE III—OPERATION AND MAINTENANCE

(1) guide the recommendations of the Secretary in any interagency determinations conducted pursuant to Federal law relating to technology protection, including relating to export licensing, deemed exports, technology transfer, and foreign direct investment;

(2) inform the Secretary while engaging in interagency processes on promotion and protection activities involving acquisition programs and technologies that are necessary to achieve and maintain the national security technology advantage of the United States and that are supportive of military requirements and strategies;

(3) inform the Department's activities to integrate acquisition, intelligence, counterintelligence and security, and law enforcement to inform requirements, acquisition, programmatic, and strategic courses of action for technology protection;

(4) inform development of research investment strategies and activities and develop innovation centers and an emerging technology industrial base through the employment of financial assistance from the United States Government through appropriate statutory authorities and programs;

(5) identify opportunities for alliances and partnerships in key research and development areas to achieve and maintain a national security technology advantage; and

(6) carry out such other purposes as identified by the Secretary.

(c) PUBLICATION.—The Secretary shall—

(1) publish the list required under subsection (a) by not later than December 31, 2018; and

(2) update such list at least annually.

**SEC. 1050. AIRBORNE HAZARDS AND OPEN BURN PIT REGISTRY.**

(a) EDUCATION CAMPAIGN.—Beginning not later than one year after the date of the enactment of this Act, the Secretary of Defense shall carry out an annual education campaign to inform individuals who may be eligible to enroll in the Airborne Hazards and Open Burn Pit Registry of such eligibility. Each such campaign shall include at least one electronic method and one physical mailing method to provide such information.

(b) AIRBORNE HAZARDS AND OPEN BURN PIT REGISTRY DEFINED.—In this section, the term "Airborne Hazards and Open Burn Pit Registry" means the registry established by the Secretary of Veterans Affairs under section 201 of the Dignified Burial and Other Veterans' Benefits Improvement Act of 2012 (Public Law 112–260; 38 U.S.C. 527 note).

**SEC. 1051. NATIONAL SECURITY COMMISSION ON ARTIFICIAL INTELLIGENCE.**

(a) ESTABLISHMENT.—

(1) IN GENERAL.—There is established in the executive branch an independent Commission to review advances in artificial intelligence, related machine learning developments, and associated technologies.

(2) TREATMENT.—The Commission shall be considered an independent establishment of the Federal Government as defined by section 104 of title 5, United States Code, and a temporary organization under section 3161 of such title.

(3) DESIGNATION.—The Commission established under paragraph (1) shall be known as the "National Security Commission on Artificial Intelligence".

(4) MEMBERSHIP.—

(A) COMPOSITION.—The Commission shall be composed of 15 members appointed as follows:

(i) The Secretary of Defense shall appoint 2 members.

(ii) The Secretary of Commerce shall appoint 1 member.

(iii) The Chairman of the Committee on Commerce, Science, and Transportation of the Senate shall appoint 1 member.

(iv) The Ranking Member of the Committee on Commerce, Science, and Transportation of the Senate shall appoint 1 member.

(v) The Chairman of the Committee on Energy and Commerce of the House of Representatives shall appoint 1 member.

(vi) The Ranking Member of the Committee on Energy and Commerce of the House of Representatives shall appoint 1 member.

(vii) The Chairman of the Committee on Armed Services of the Senate shall appoint 1 member.

(viii) The Ranking Member of the Committee on Armed Services of the Senate shall appoint 1 member.

(ix) The Chairman of the Committee on Armed Services of the House of Representatives shall appoint 1 member.

(x) The Ranking Member of the Committee on Armed Services of the House of Representatives shall appoint 1 member.

(xi) The Chairman of the Select Committee on Intelligence of the Senate shall appoint 1 member.

(xii) The Vice Chairman of the Select Committee on Intelligence of the Senate shall appoint 1 member.

(xiii) The Chairman of the Permanent Select Committee on Intelligence of the House of Representatives shall appoint 1 member.

(xiv) The Ranking Member of the Permanent Select Committee Intelligence of the House of Representatives shall appoint 1 member.

(B) DEADLINE FOR APPOINTMENT.—Members shall be appointed to the Commission under paragraph (1) not later than 90 days after the Commission establishment date.

(C) EFFECT OF LACK OF APPOINTMENT BY APPOINTMENT DATE.—If one or more appointments under paragraph (1) is not made by the appointment date specified in paragraph (2), the authority to make such appointment or appointments shall expire, and the number of members of the Commission shall be reduced by the number equal to the number of appointments so not made.

(5) CHAIR AND VICE CHAIR.—The Commission shall elect a Chair and Vice Chair from among its members.

(6) TERMS.—Members shall be appointed for the life of the Commission. A vacancy in the Commission shall not affect

its powers, and shall be filled in the same manner as the original appointment was made.

(7) STATUS AS FEDERAL EMPLOYEES.—Notwithstanding the requirements of section 2105 of title 5, United States Code, including the required supervision under subsection (a)(3) of such section, the members of the Commission shall be deemed to be Federal employees.

(b) DUTIES.—

(1) IN GENERAL.—The Commission shall carry out the review described in paragraph (2). In carrying out such review, the Commission shall consider the methods and means necessary to advance the development of artificial intelligence, machine learning, and associated technologies by the United States to comprehensively address the national security and defense needs of the United States.

(2) SCOPE OF THE REVIEW.—In conducting the review paragraph (1), the Commission shall consider the following:

(A) The competitiveness of the United States in artificial intelligence, machine learning, and other associated technologies, including matters related to national security, defense, public-private partnerships, and investments.

(B) Means and methods for the United States to maintain a technological advantage in artificial intelligence, machine learning, and other associated technologies related to national security and defense.

(C) Developments and trends in international cooperation and competitiveness, including foreign investments in artificial intelligence, related machine learning, and computer science fields that are materially related to national security and defense.

(D) Means by which to foster greater emphasis and investments in basic and advanced research to stimulate private, public, academic and combined initiatives in artificial intelligence, machine learning, and other associated technologies, to the extent that such efforts have application materially related to national security and defense.

(E) Workforce and education incentives to attract and recruit leading talent in artificial intelligence and machine learning disciplines, including science, technology, engineering, and math programs.

(F) Risks associated with United States and foreign country advances in military employment of artificial intelligence and machine learning, including international law of armed conflict, international humanitarian law, and escalation dynamics.

(G) Associated ethical considerations related to artificial intelligence and machine learning as it will be used for future applications related to national security and defense.

(H) Means to establish data standards, and incentivize the sharing of open training data within related national security and defense data-driven industries.

(I) Consideration of the evolution of artificial intelligence and appropriate mechanism for managing such technology related to national security and defense.

(J) Any other matters the Commission deems relevant to the common defense of the Nation.

(c) REPORTS.—

(1) INITIAL REPORT.—Not later than 180 days after the date of the enactment of this Act, the Commission shall submit to the President and Congress an initial report on the findings of the Commission and such recommendations that the Commission may have for action by the executive branch and Congress related to artificial intelligence, machine learning, and associated technologies, including recommendations to more effectively organize the Federal Government.

(2) ANNUAL COMPREHENSIVE REPORTS.—Not later than one year after the date of this enactment of this Act, and every year thereafter annually, until the date specified in subsection (e), the Commission shall submit a comprehensive report on the review required under subsection (b).

(3) FORM OF REPORTS.—Reports submitted under this subsection shall be made publically available, but may include a classified annex.

(d) FUNDING.—Of the amounts authorized to be appropriated by this Act for fiscal year 2019 for the Department of Defense, not more than $10,000,000 shall be made available to the Commission to carry out its duties under this subtitle. Funds made available to the Commission under the preceding sentence shall remain available until expended.

(e) TERMINATION.—The Commission shall terminate on October 1, 2020.

(f) DEFINITION OF ARTIFICIAL INTELLIGENCE.—In this section, the term "artificial intelligence" includes each of the following:

(1) Any artificial system that performs tasks under varying and unpredictable circumstances without significant human oversight, or that can learn from experience and improve performance when exposed to data sets.

(2) An artificial system developed in computer software, physical hardware, or other context that solves tasks requiring human-like perception, cognition, planning, learning, communication, or physical action.

(3) An artificial system designed to think or act like a human, including cognitive architectures and neural networks.

(4) A set of techniques, including machine learning that is designed to approximate a cognitive task.

(5) An artificial system designed to act rationally, including an intelligent software agent or embodied robot that achieves goals using perception, planning, reasoning, learning, communicating, decision-making, and acting.

**SEC. 1052. AUTHORITY TO TRANSFER FUNDS FOR BIEN HOA DIOXIN CLEANUP.**

(a) TRANSFER AUTHORITY.—Notwithstanding section 2215 of title 10, United States Code, the Secretary of Defense may transfer to the Secretary of State, for use by the United States Agency for International Development, amounts to be used for the Bien Hoa dioxin cleanup in Vietnam.

(b) LIMITATION ON AMOUNTS.—Not more than $15,000,000 may be transferred in fiscal year 2019 under the authority in subsection (a).

(c) SOURCE OF FUNDS.—The Secretary of Defense may transfer funds appropriated to the Department of Defense for "Operation

**SEC. 1636. POLICY OF THE UNITED STATES ON CYBERSPACE, CYBERSECURITY, CYBER WARFARE, AND CYBER DETERRENCE.**

(a) IN GENERAL.—It shall be the policy of the United States, with respect to matters pertaining to cyberspace, cybersecurity, and cyber warfare, that the United States should employ all instruments of national power, including the use of offensive cyber capabilities, to deter if possible, and respond to when necessary, all cyber attacks or other malicious cyber activities of foreign powers that target United States interests with the intent to—

(1) cause casualties among United States persons or persons of United States allies;

(2) significantly disrupt the normal functioning of United States democratic society or government (including attacks against critical infrastructure that could damage systems used to provide key services to the public or government);

(3) threaten the command and control of the Armed Forces, the freedom of maneuver of the Armed Forces, or the industrial base or other infrastructure on which the United States Armed Forces rely to defend United States interests and commitments; or

(4) achieve an effect, whether individually or in aggregate, comparable to an armed attack or imperil a vital interest of the United States.

(b) RESPONSE OPTIONS.—In carrying out the policy set forth in subsection (a), the United States shall plan, develop, and, when appropriate, demonstrate response options to address the full range of potential cyber attacks on United States interests that could be conducted by potential adversaries of the United States.

(c) DENIAL OPTIONS.—In carrying out the policy set forth in subsection (a) through response options developed pursuant to subsection (b), the United States shall, to the greatest extent practicable, prioritize the defensibility and resiliency against cyber attacks and malicious cyber activities described in subsection (a) of infrastructure critical to the political integrity, economic security, and national security of the United States.

(d) COST-IMPOSITION OPTIONS.—In carrying out the policy set forth in subsection (a) through response options developed pursuant to subsection (b), the United States shall develop and, when appropriate, demonstrate, or otherwise make known to adversaries the existence of, cyber capabilities to impose costs on any foreign power targeting the United States or United States persons with a cyber attack or malicious cyber activity described in subsection (a).

(e) MULTI-PRONG RESPONSE.—In carrying out the policy set forth in subsection (a) through response options developed pursuant to subsection (b), the United States shall leverage all instruments of national power.

(f) UPDATE ON PRESIDENTIAL POLICY.—

(1) IN GENERAL.—Not later than 180 days after the date of the enactment of this Act, the President shall transmit, in unclassified and classified forms, as appropriate, to the appropriate congressional committees a report containing an update to the report provided to the Congress on the policy of the United States on cyberspace, cybersecurity, and cyber warfare pursuant to section 1633 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 10 U.S.C. 130g note).

(2) CONTENTS.—The report required under paragraph (1) shall include the following:

(A) An assessment of the current posture in cyberspace, including assessments of—

(i) whether past responses to major cyber attacks have had the desired deterrent effect; and

(ii) how adversaries have responded to past United States responses.

(B) Updates on the Administration's efforts in the development of—

(i) cost imposition strategies;

(ii) varying levels of cyber incursion and steps taken to date to prepare for the imposition of the consequences referred to in clause (i); and

(iii) the Cyber Deterrence Initiative.

(C) Information relating to the Administration's plans, including specific planned actions, regulations, and legislative action required, for—

(i) advancing technologies in attribution, inherently secure technology, and artificial intelligence society-wide;

(ii) improving cybersecurity in and cooperation with the private sector;

(iii) improving international cybersecurity cooperation; and

(iv) implementing the policy referred to in paragraph (1), including any realignment of government or government responsibilities required, writ large.

(f) RULE OF CONSTRUCTION.—Nothing in this subsection may be construed to limit the authority of the President or Congress to authorize the use of military force.

(g) DEFINITIONS.—In this section:

(1) APPROPRIATE CONGRESSIONAL COMMITTEES.—The term "appropriate congressional committees" means—

(A) the congressional defense committees;

(B) the Permanent Select Committee on Intelligence of the House of Representatives;

(C) the Select Committee on Intelligence of the Senate;

(D) the Committee on Foreign Affairs, the Committee on Homeland Security, and the Committee on the Judiciary of the House of Representatives; and

(E) the Committee on Foreign Relations, the Committee on Homeland Security and Governmental Affairs, and the Committee on the Judiciary of the Senate.

(2) FOREIGN POWER.—The term "foreign power" has the meaning given such term in section 101 of the Foreign Intelligence Surveillance Act of 1978 (50 U.S.C. 1801).

**SEC. 1637. BUDGET DISPLAY FOR CYBER VULNERABILITY EVALUATIONS AND MITIGATION ACTIVITIES FOR MAJOR WEAPON SYSTEMS OF THE DEPARTMENT OF DEFENSE.**

(a) BUDGET REQUIRED.—Beginning in fiscal year 2021 and in each fiscal year thereafter, the Secretary of Defense shall submit to Congress, as a part of the documentation that supports the

**SEC. 1648. TIER 1 EXERCISE OF SUPPORT TO CIVIL AUTHORITIES FOR A CYBER INCIDENT.**

(a) IN GENERAL.—The Commander of the United States Cyber Command, the Commander of United States Northern Command, and such other commands or components of the Department of Defense as the Secretary of Defense considers appropriate, shall, consistent with the recommendations made by the Comptroller General of the United States in the Government Accountability Office report GAO–16–574, conduct a tier 1 exercise of support to civil authorities for a cyber incident.

(b) ELEMENTS.—The exercise required by subsection (a) shall include the following:

(1) Department level leadership and decision-making for providing cyber support to civil authorities.

(2) Testing of the policy, guidance, doctrine and other elements in the Department of Defense Cyber Incident Coordinating Procedure.

(3) Operational planning and execution by the Joint Staff and supported and supporting combatant commands.

(4) Coordination with, and incorporation of, as appropriate, the Department of Homeland Security, the Federal Bureau of Investigation, and elements across Federal and State governments and the private sector.

**SEC. 1649. PILOT PROGRAM ON MODELING AND SIMULATION IN SUPPORT OF MILITARY HOMELAND DEFENSE OPERATIONS IN CONNECTION WITH CYBER ATTACKS ON CRITICAL INFRASTRUCTURE.**

(a) PILOT PROGRAM REQUIRED.—

(1) IN GENERAL.—The Assistant Secretary of Defense for Homeland Defense and Global Security shall carry out a pilot program to model cyber attacks on critical infrastructure in order to identify and develop means of improving Department of Defense responses to requests for defense support to civil authorities for such attacks.

(2) RESEARCH EXERCISES.—The pilot program shall source data from and include consideration of the "Jack Voltaic" research exercises conducted by the Army Cyber Institute, industry partners of the Institute, and the cities of New York, New York, and Houston, Texas.

(b) PURPOSE.—The purpose of the pilot program shall be to accomplish the following:

(1) The development and demonstration of risk analysis methodologies, and the application of commercial simulation and modeling capabilities, based on artificial intelligence and hyperscale cloud computing technologies, as applicable—

(A) to assess defense critical infrastructure vulnerabilities and interdependencies to improve military resiliency;

(B) to determine the likely effectiveness of attacks described in subsection (a)(1), and countermeasures, tactics, and tools supporting responsive military homeland defense operations;

(C) to train personnel in incident response;

(D) to conduct exercises and test scenarios;

(E) to foster collaboration and learning between and among departments and agencies of the Federal Government, State and local governments, and private entities responsible for critical infrastructure; and

(F) improve intra-agency and inter-agency coordination for consideration and approval of requests for defense support to civil authorities.

(2) The development and demonstration of the foundations for establishing and maintaining a program of record for a shared high-fidelity, interactive, affordable, cloud-based modeling and simulation of critical infrastructure systems and incident response capabilities that can simulate complex cyber and physical attacks and disruptions on individual and multiple sectors on national, regional, State, and local scales.

(c) REPORT.—

(1) IN GENERAL.—At the same time the budget of the President for fiscal year 2021 is submitted to Congress pursuant to section 1105(a) of title 31, United States Code, the Assistant Secretary shall, in consultation with the Secretary of Homeland Security, submit to the congressional defense committees a report on the pilot program.

(2) CONTENTS.—The report required by paragraph (1) shall include the following:

(A) A description of the results of the pilot program as of the date of the report.

(B) A description of the risk analysis methodologies and modeling and simulation capabilities developed and demonstrated pursuant to the pilot program, and an assessment of the potential for future growth of commercial technology in support of the homeland defense mission of the Department of Defense.

(C) Such recommendations as the Secretary considers appropriate regarding the establishment of a program of record for the Department on further development and sustainment of risk analysis methodologies and advanced, large-scale modeling and simulation on critical infrastructure and cyber warfare.

(D) Lessons learned from the use of novel risk analysis methodologies and large-scale modeling and simulation carried out under the pilot program regarding vulnerabilities, required capabilities, and reconfigured force structure, coordination practices, and policy.

(E) Planned steps for implementing the lessons described in subparagraph (D).

(F) Any other matters the Secretary determines appropriate.

**SEC. 1650. PILOT PROGRAM AUTHORITY TO ENHANCE CYBERSECURITY AND RESILIENCY OF CRITICAL INFRASTRUCTURE.**

(a) AUTHORITY.—The Secretary of Defense, in coordination with the Secretary of Homeland Security, is authorized to provide, detail, or assign technical personnel to the Department of Homeland Security on a non-reimbursable basis to enhance cybersecurity cooperation, collaboration, and unity of Government efforts.

(b) SCOPE OF ASSISTANCE.—The authority under subsection (a) shall be limited in any fiscal year to the provision of not more than 50 technical cybersecurity personnel from the Department