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Subtitle A—Authorization of Appropriations

SEC. 201. AUTHORIZATION OF APPROPRIATIONS.

Funds are hereby authorized to be appropriated for fiscal year 2020 for the use of the Department of Defense for research, development, test, and evaluation, as specified in the funding table in section 4201.

Subtitle B—Program Requirements, Restrictions, and Limitations

SEC. 211. PROGRAM ON ENHANCEMENT OF PREPARATION OF DEPENDENTS OF MEMBERS OF ARMED FORCES FOR CAREERS IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS.

(a) PROGRAM REQUIRED.—Chapter 111 of title 10, United States Code, is amended by inserting after section 2192a the following new section:

“§ 2192b. Program on enhancement of preparation of dependents of members of armed forces for careers in science, technology, engineering, and mathematics

“(a) PROGRAM REQUIRED.—The Secretary of Defense shall carry out a program to—

“(1) enhance the preparation of students at covered schools for careers in science, technology, engineering, and mathematics; and

“(2) provide assistance to teachers at covered schools to enhance preparation described in paragraph (1).

“(b) COORDINATION.—In carrying out the program, the Secretary shall coordinate with the following:

“(1) The Secretaries of the military departments.

“(2) The Secretary of Education.

“(3) The National Science Foundation.

“(4) Other organizations as the Secretary of Defense considers appropriate.

“(c) ACTIVITIES.—Activities under the program may include the following:

“(1) Establishment of targeted internships and cooperative research opportunities at defense laboratories and other technical centers for students and teachers at covered schools.

“(2) Establishment of scholarships and fellowships for students at covered schools.

“(3) Efforts and activities that improve the quality of science, technology, engineering, and mathematics educational and training opportunities for students and teachers at covered schools, including with respect to improving the development of curricula at covered schools.

“(4) Development of travel opportunities, demonstrations, mentoring programs, and informal science education for students and teachers at covered schools.

“(d) METRICS.—The Secretary shall establish outcome-based metrics and internal and external assessments to evaluate the merits and benefits of activities conducted under the program with respect to the needs of the Department of Defense.

“(e) COVERED SCHOOLS DEFINED.—In this section, the term ‘covered schools’ means elementary or secondary schools at which the Secretary determines a significant number of dependents of members of the armed forces are enrolled.”

(b) CLERICAL AMENDMENT.—The table of sections at the beginning of such chapter is amended by inserting after the item relating to section 2192a the following new item:

“2192b. Program on enhancement of preparation of dependents of members of armed forces for careers in science, technology, engineering, and mathematics.”

(c) CONFORMING REPEAL.—Section 233 of the Carl Levin and Howard P. “Buck” McKeon National Defense Authorization Act for Fiscal Year 2015 (Public Law 113–291; 10 U.S.C. 2193a note) is repealed.

SEC. 212. UPDATES TO THE DEPARTMENT OF DEFENSE PERSONNEL MANAGEMENT AUTHORITY TO ATTRACT EXPERTS IN SCIENCE AND ENGINEERING.

(a) IN GENERAL.—Subsection (a) of section 1599h of title 10, United States Code, is amended by adding at the end the following new paragraph:

“(6) *JOINT ARTIFICIAL INTELLIGENCE CENTER.*—The Director of the Joint Artificial Intelligence Center may carry out a program of personnel management authority provided in subsection (b) in order to facilitate recruitment of eminent experts in science or engineering for the Center. The authority to carry out the program under this paragraph shall terminate on December 31, 2024.”

(b) *SCOPE OF APPOINTMENT AUTHORITY.*—Subsection (b)(1) of such section is amended—

(1) in subparagraph (D), by striking “and” at the end;

(2) in subparagraph (E), by adding “and” at the end; and

(3) by adding at the end the following new subparagraph:

“(F) in the case of the Joint Artificial Intelligence Center, appoint scientists and engineers to a total of not more than 5 scientific and engineering positions in the Center;”.

(c) *EXTENSION OF TERMS OF APPOINTMENT.*—Subsection (c)(2) of such section is amended by striking “or the Defense Innovation Unit Experimental” and inserting “the Defense Innovation Unit, or the Joint Artificial Intelligence Center”.

(d) *UPDATE TO ORGANIZATIONAL NAME.*—Such section is further amended—

(1) in subsection (a)(5)—

(A) in the subsection heading by striking “DIUX” and inserting “DIU”; and

(B) by striking “Experimental”; and

(2) in subsection (b)(1)(E), by striking “Experimental”.

SEC. 213. ESTABLISHMENT OF JOINT RESERVE DETACHMENT OF THE DEFENSE INNOVATION UNIT.

(a) *IN GENERAL.*—

(1) *ESTABLISHMENT OF JOINT RESERVE DETACHMENT OF THE DEFENSE INNOVATION UNIT.*—Chapter 139 of title 10, United States Code, is amended by inserting after section 2358a the following new section:

“§ 2358b. Joint reserve detachment of the Defense Innovation Unit

“(a) *ESTABLISHMENT.*—The Secretary of Defense, in consultation with the Secretaries of the military departments, may establish a joint reserve detachment (referred to in this section as the ‘Detachment’) composed of members of the reserve components described in subsection (b) to be assigned to each office of the Defense Innovation Unit to—

“(1) support engagement and collaboration with private-sector industry and the community surrounding the location of such office; and

“(2) to accelerate the use and adoption of commercially-developed technologies for national security purposes.

“(b) *MEMBERS.*—Each Secretary of a military department shall select for the Detachment, and make efforts to retain, members of the reserve components who possess relevant private-sector experience in the fields of business, acquisition, intelligence, engineering, technology transfer, science, mathematics, program management, logistics, cybersecurity, or such other fields as determined by the Under Secretary of Defense for Research and Engineering.

“(c) *DUTIES.*—The Detachment shall have the following duties:

- “(1) Providing the Department of Defense with—
 “(A) expertise on and analysis of commercially-developed technologies;
 “(B) commercially-developed technologies to be used as alternatives for technologies in use by the Department; and
 “(C) opportunities for greater engagement and collaboration between the Department and private-sector industry on innovative technologies.
 “(2) On an ongoing basis—
 “(A) partnering with the military departments, the combatant commands, and other Department of Defense organizations to—
 “(i) identify and rapidly prototype commercially-developed technologies; and
 “(ii) use alternative contracting mechanisms to procure such technologies;
 “(B) increasing awareness of—
 “(i) the work of the Defense Innovation Unit; and
 “(ii) the technology requirements of the Department of Defense as identified in the National Defense Science and Technology Strategy developed under section 218 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232; 132 Stat. 1679); and
 “(C) using the investment in research and development made by private-sector industry in assessing and developing dual-use technologies.
 “(3) Carrying out other activities as directed by the Under Secretary of Defense for Research and Engineering.
 “(d) JOINT DUTY.—Assignment to a Detachment shall not qualify as a joint duty assignment, as defined in section 668(b)(1) of title 10, United States Code, unless approved by the Secretary of Defense.”.
- (2) CLERICAL AMENDMENT.—The table of sections at the beginning of such chapter is amended by inserting after the item relating to section 2358a the following new item:
 “2358b. Joint reserve detachment of the Defense Innovation Unit.”.
- (b) IMPLEMENTATION REPORT.—Not later than 120 days after the date of the enactment of this Act, the Under Secretary of Defense for Research and Engineering, in consultation with the Director of the Defense Innovation Unit and the Secretaries of the military departments, shall submit to the congressional defense committees a report that includes—
 (1) an organizational plan and the estimated costs for establishing the joint reserve detachment required under section 2358b of title 10, United States Code (as added by subsection (a)); and
 (2) a timeline specifying when such detachment will attain initial operational capability and full operational capability, respectively.

SEC. 214. RESEARCH AND EDUCATIONAL PROGRAMS AND ACTIVITIES FOR HISTORICALLY BLACK COLLEGES AND UNIVERSITIES AND MINORITY-SERVING INSTITUTIONS OF HIGHER EDUCATION.

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

(1) by redesignating subsections (d) and (e) as subsections (e) and (f), respectively; and

(2) by inserting after subsection (c) the following new subsection:

“(d) *INCENTIVES.*—The Secretary of Defense may develop incentives to encourage research and educational collaborations between covered educational institutions and other institutions of higher education.”.

SEC. 215. MODIFICATION OF AUTHORITY FOR PRIZES FOR ADVANCED TECHNOLOGY ACHIEVEMENTS.

Section 2374a(a) of title 10, United States Code, is amended by striking “Assistant Secretary of Defense for Research and Engineering” and inserting “Under Secretary of Defense for Research and Engineering, the Under Secretary of Defense for Acquisition and Sustainment,”.

SEC. 216. JOINT HYPERSONICS TRANSITION OFFICE.

Section 218 of the John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109–364; 10 U.S.C. 2358 note) is amended—

(1) in subsection (a), by striking “the program required under subsection (b), and shall” and inserting “the program and activities described in subsections (b) through (f), and shall”;

(2) by redesignating subsections (c) through (e) as subsections (d) through (f), respectively;

(3) by inserting after subsection (b) the following new subsection (c):

“(c) *UNIVERSITY EXPERTISE.*—

“(1) *ARRANGEMENT WITH INSTITUTIONS OF HIGHER EDUCATION.*—Using the authority specified in section 217 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 10 U.S.C. 2358 note) or another similar authority, the Office shall seek to enter into an arrangement with one or more institutions of higher education (as defined in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001)) under which such institutions may provide the Office with—

“(A) access to research, technology development, and workforce development expertise to support the mission of the Office; and

“(B) foundational and applied hypersonic research, development, and workforce support in areas that the Office determines to be relevant for the Department of Defense.

“(2) *AVAILABILITY OF INFORMATION.*—The Office shall ensure that the results of any research and reports produced pursuant to an arrangement under paragraph (1) are made available to the Federal Government, the private sector, academia, and international partners consistent with appropriate security classification guidance.”;

(4) in subsection (d), as so redesignated—

(A) in paragraph (4), by striking the comma before the period; and

(B) in paragraph (5), by striking “certified under subsection (e) as being consistent with the roadmap under sub-

section (d)” and inserting “certified under subsection (f) as being consistent with the roadmap under subsection (e)”;

(5) in subsection (e), as so redesignated, by adding at the end the following new paragraph:

“(4) SUBMITTAL TO CONGRESS.—

“(A) INITIAL SUBMISSION.—Not later than 180 days after the date of the enactment of this paragraph, the Secretary of Defense shall submit to the congressional defense committees the most recent roadmap developed under paragraph (1).

“(B) SUBSEQUENT SUBMISSIONS.—The Secretary of Defense shall submit to the congressional defense committees each roadmap revised under paragraph (1) together with the budget submitted to Congress under section 1105 of title 31, United States Code, for the fiscal year concerned.”; and

(6) in subsection (f), as so redesignated—

(A) by striking “subsection (d)” each place it appears and inserting “subsection (e)”;

(B) in paragraph (3), by striking “2016” and inserting “2026”.

SEC. 217. MODIFICATION OF PROOF OF CONCEPT COMMERCIALIZATION PROGRAM.

(a) EXTENSION OF PROGRAM.—Section 1603(g) of the National Defense Authorization Act for Fiscal Year 2014 (Public Law 113–66; 10 U.S.C. 2359 note) is amended by striking “2019” and inserting “2024”.

(b) ADDITIONAL IMPROVEMENTS.—Section 1603 of such Act, as amended by subsection (a), is further amended—

(1) in the section heading, by inserting “OF DUAL-USE TECHNOLOGY” after “COMMERCIALIZATION”;

(2) in subsection (a)—

(A) by inserting “of Dual-Use Technology” after “Commercialization”;

(B) by inserting “with a focus on priority defense technology areas that attract public and private sector funding, as well as private sector investment capital, including from venture capital firms in the United States,” before “in accordance”;

(3) in subsection (c)(4)(A)(iv), by inserting “, which may include access to venture capital” after “award”;

(4) by striking subsection (d);

(5) by redesignating subsection (e) as subsection (d);

(6) by inserting after subsection (d), as so redesignated, the following new subsection (e):

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

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

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

“(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 225 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 10 U.S.C. 2359 note).

“(7) Section 1711 of such Act (Public Law 115–91; 10 U.S.C. 2505 note), relating to a pilot program on strengthening manufacturing in the defense industrial base.

“(8) 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) by striking subsection (f); and

(8) by redesignating subsection (g) as subsection (f).

SEC. 218. MODIFICATION OF AUTHORITY AND ADDITION OF TECHNOLOGY AREAS FOR EXPEDITED ACCESS TO TECHNICAL TALENT.

(a) **MODIFICATION OF AUTHORITY.**—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 “The Secretary of Defense shall, acting through the secretaries of the military departments, establish” and inserting “Not later than 180 days after the date of the enactment of the National Defense Authorization Act for Fiscal Year 2020, the Secretary of Defense shall direct the secretaries of the military departments to establish”.

(b) **ADDITIONAL TECHNOLOGY AREAS.**—Subsection (e) of such section is amended—

(1) by redesignating paragraph (27) as paragraph (30); and

(2) by inserting after paragraph (26) the following new paragraph (27):

“(27) Rapid prototyping.

“(28) Infrastructure resilience.

“(29) Hypersonics.”

SEC. 219. EXPANSION OF COORDINATION IN SUPPORT OF 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 paragraph:

“(18) The Lab-Embedded Entrepreneurship Programs of the Department of Energy.”

SEC. 220. MODIFICATION OF DEFENSE QUANTUM INFORMATION SCIENCE AND TECHNOLOGY RESEARCH AND DEVELOPMENT PROGRAM.

Section 234 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232; 10 U.S.C. 2358 note) is amended—

(1) in subsection (b)—

(A) in paragraph (2), by striking “private sector entities” and inserting “private sector and international entities”; and

(B) in paragraph (6), by striking “facilities and infrastructure” and inserting “facilities, workforce, and infrastructure”;

(2) in subsection (c)—

(A) in paragraph (2), by striking “quantum sciences;” and inserting “quantum information sciences, including through consultation with—

“(A) the National Quantum Coordination Office;

“(B) the subcommittee on Quantum Information Science of the National Science and Technology Council;

“(C) other organizations and elements of the Department of Defense;

“(D) other Federal agencies; and

“(E) appropriate private sector organizations;”;

(B) by redesignating paragraphs (3) and (4) as paragraphs (6) and (7), respectively;

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

“(3) in consultation with the entities listed in paragraph (2), develop plans for—

“(A) the development of the quantum information science and technology workforce;

“(B) enhancing awareness of quantum information science and technology;

“(C) reducing the risk of cybersecurity threats posed by quantum information science technology; and

“(D) development of ethical guidelines for the use of quantum information science technology;

“(4) in consultation with the National Institute of Standards and Technology and other appropriate Federal entities, develop a quantum information science taxonomy and standards and requirements for quantum information technology;

“(5) support efforts to increase the technology readiness level of quantum information science technologies under development in the United States;”;

(D) in paragraph (6), as so redesignated, by striking “quantum science” and inserting “quantum information science”; and

(E) in paragraph (7), as so redesignated, by striking “for meeting the long-term challenges and achieving the specific technical goals” and inserting “for carrying out the program under subsection (a)”;

(3) by redesignating subsection (d) as subsection (e);

(4) by inserting after subsection (c) the following new subsection (d):

“(d) QUANTUM INFORMATION SCIENCE RESEARCH CENTERS.—The Secretary of each military department may establish or designate a defense laboratory or establish activities to engage with appropriate public and private sector organizations, including academic organizations, to enhance and accelerate the research, development, and deployment of quantum information sciences and quantum information science-enabled technologies and systems. The Secretary of Defense shall ensure that not less than one such laboratory or center is established or designated.”; and

(5) in paragraph (2) of subsection (e), as so redesignated—

(A) in subparagraph (A), by inserting “information” before “sciences”;

(B) in subparagraph (B),

(i) by inserting “information” before “sciences”; and

(ii) by inserting “, including a discussion of likely impacts of quantum information science and technology on military capabilities” before the period at the end;

(C) in subparagraph (C), by inserting “information” before “sciences”;

(D) by redesignating subparagraph (E) as subparagraph (F); and

(E) by striking subparagraph (D) and inserting the following new subparagraphs:

“(D) A description of the activities carried out in accordance with this section, including, for each such activity—

“(i) a roadmap for the activity;

“(ii) a summary of the funding provided for the activity; and

“(iii) an estimated timeline for the development and military deployment of quantum technologies supported through the activity.

“(E) A description of the efforts of the Department of Defense to update classification and cybersecurity practices relating to quantum technology, including—

“(i) security processes and requirements for engagement with allied countries; and

“(ii) a plan for security-cleared government and contractor workforce development.”.

SEC. 221. UNDERSTANDING OF INVESTMENTS IN ARTIFICIAL INTELLIGENCE AND DEVELOPMENT OF CAPABILITIES BY ADVERSARIES.

Section 238(c)(2)(I) of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232) is amended—

(1) in clause (i), by striking “; and” and inserting a semicolon;

(2) in clause (ii), by striking the period at the end and inserting “; and”; and

(3) by adding at the end the following new clause:

“(iii) that appropriate entities in the Department are reviewing all open source publications from both the United States and outside the United States that contribute to, affect, or advance—

“(I) artificial intelligence research and development; or

“(II) the understanding of the Secretary concerning the investments by adversaries of the United States in artificial intelligence and the development by such adversaries of capabilities relating to artificial intelligence.”.

SEC. 222. ADVISORY ROLE OF JASON SCIENTIFIC ADVISORY GROUP.

(a) **ONGOING ENGAGEMENT OF CERTAIN SCIENTIFIC ADVISORY PERSONNEL.**—

(1) **IN GENERAL.**—The Secretary of Defense shall seek to engage the members of the independent, private scientific advisory group known as “JASON” as advisory personnel to provide advice, on an ongoing basis, on matters involving science, tech-

nology, and national security, including methods to defeat existential and technologically-amplified threats to national security.

(2) *AVAILABILITY TO OTHER FEDERAL AGENCIES.*—At the request of a Federal agency outside the Department of Defense, the Secretary of Defense shall seek to make personnel engaged under paragraph (1) available to such agency for the purpose of providing advice to the agency on the matters described in such subsection.

(b) *ARRANGEMENT FOR CONDUCT OF NATIONAL SECURITY STUDIES AND ANALYSIS.*—

(1) *IN GENERAL.*—Pursuant to subsection (a), the Secretary of Defense, acting through the Under Secretary of Defense for Acquisition and Sustainment, shall seek to enter into an arrangement under which JASON may provide national security research studies and other analyses to the Department of Defense and other Federal agencies to meet mission requirements and agency needs.

(2) *FORM OF ARRANGEMENT.*—The arrangement entered into under paragraph (1) shall be in a form the Under Secretary of Defense for Acquisition and Sustainment determines to be appropriate for the Department of Defense, which may include a contract, a grant, a cooperative agreement, the use of other transaction authority under section 2371 of title 10, United States Code, or another such arrangement.

(3) *TIMING OF ARRANGEMENT.*—The Secretary of Defense shall seek to enter into the arrangement under paragraph (1) not later than 120 days after the date of the enactment of this Act.

(4) *TERMS OF ARRANGEMENT.*—The arrangement entered into under paragraph (1) shall—

(A) if specifically negotiated as part of the arrangement, provide for the Department of Defense to reimburse the entity supporting JASON for all or a portion of the overhead costs incurred in support of the arrangement;

(B) allow Federal Government entities outside the Department of Defense with responsibilities relating to national security to seek to engage JASON to perform individual studies relating to national security matters as part of the arrangement; and

(C) require that a Federal agency that engages JASON to perform a study under the arrangement will fully fund such study, including a proportional percentage to the total overhead costs incurred under the arrangement.

(5) *LIMITATION ON TERMINATION.*—

(A) *IN GENERAL.*—The Secretary of Defense may not terminate the arrangement under paragraph (1) until a period of 180 days has elapsed following the date on which the Secretary—

(i) notifies the congressional defense committees of the intent of the Secretary to terminate the arrangement; and

(ii) submits the report required under subparagraph (B).

(B) *REPORT REQUIRED.*—

(i) *IN GENERAL.*—If the Secretary of Defense determines that the arrangement under paragraph (1) should be terminated, the Secretary shall submit to the congressional defense committees a report on the proposed termination of the arrangement.

(ii) *ELEMENTS.*—The report required under clause (i) shall include the following:

(I) A summary of the execution of research projects conducted by JASON over the four fiscal years preceding the date of the report, including the projects requested by the Department of Defense and the projects requested by other Federal agencies.

(II) An analysis of the costs to the Department of Defense of maintaining the arrangement under which JASON provided national security research studies, including any overhead costs incurred by the Department or shared among Federal agencies over the four fiscal years preceding the date of the report.

(III) A timeline for the potential transition or termination of the activities, functions, and expertise provided by JASON under the arrangement.

(IV) An assessment of the impact that the termination of the arrangement with JASON will have on defense research studies and analytical capabilities, including a mitigation plan that identifies where alternative and comparable scientific advice and expertise is available and a comparison of the costs associated with each alternative.

(iii) *FORM OF REPORT.*—The report required under clause (i) may be submitted in unclassified or classified form.

(6) *ANNUAL SUMMARY REPORT.*—Not later than March 1 of each year beginning after the date of the enactment of this Act, the Secretary of Defense shall submit to the congressional defense committees a report that includes—

(A) a summary of expenditures made under the arrangement with JASON under paragraph (1); and

(B) a summary of the studies and other activities carried out by JASON pursuant to such arrangement in the preceding calendar year.

SEC. 223. DIRECT AIR CAPTURE AND BLUE CARBON REMOVAL TECHNOLOGY PROGRAM.

(a) *PROGRAM REQUIRED.*—

(1) *IN GENERAL.*—The Secretary of Defense, in coordination with the Secretary of Homeland Security, the Secretary of Energy, and the heads of such other Federal agencies as the Secretary of Defense considers appropriate, shall carry out a program on research, development, testing, evaluation, study, and demonstration of technologies related to blue carbon capture and direct air capture.

(2) *PROGRAM GOALS.*—The goals of the program established under paragraph (1) are as follows:

(A) To develop technologies that capture carbon dioxide from seawater and the air to turn such carbon dioxide into clean fuels to enhance fuel and energy security.

(B) To develop and demonstrate technologies that capture carbon dioxide from seawater and the air to reuse such carbon dioxide to create products for military uses.

(C) To develop direct air capture technologies for use—
(i) at military installations or facilities of the Department of Defense; or

(ii) in modes of transportation by the Navy or the Coast Guard.

(3) PHASES.—The program established under paragraph (1) shall be carried out in two phases as follows:

(A) The first phase shall consist of research and development and shall be carried out as described in subsection (b).

(B) The second phase shall consist of testing and evaluation and shall be carried out as described in subsection (c), if the Secretary determines that the results of the research and development phase justify implementing the testing and evaluation phase.

(4) DESIGNATION.—The program established under paragraph (1) shall be known as the “Direct Air Capture and Blue Carbon Removal Technology Program” (in this section referred to as the “Program”).

(b) RESEARCH AND DEVELOPMENT PHASE.—

(1) IN GENERAL.—During the research and development phase of the Program, the Secretary of Defense shall conduct research and development in pursuit of the goals set forth in subsection (a)(2).

(2) DIRECT AIR CAPTURE.—The research and development phase of the Program may include, with respect to direct air capture, a front end engineering and design study that includes an evaluation of direct air capture designs to produce fuel for use—

(A) at military installations or facilities of the Department of Defense; or

(B) in modes of transportation by the Navy or the Coast Guard.

(3) COMMENCEMENT.—The Secretary shall commence carrying out the research and development phase of the Program not later than 90 days after the date of the enactment of this Act.

(4) GRANTS AUTHORIZED.—The Secretary may carry out the research and development phase of the Program through the award of grants to private persons and eligible laboratories.

(5) REPORT REQUIRED.—Not later than 180 days after the date of the completion of the research and development phase of the Program, the Secretary shall submit to Congress a report on the research and development carried out under the Program.

(c) TESTING AND EVALUATION PHASE.—

(1) IN GENERAL.—During the testing and evaluation phase of the Program, the Secretary shall, in pursuit of the goals set forth in subsection (a)(2), conduct tests and evaluations of the

technologies researched and developed during the research and development phase of the Program.

(2) *DIRECT AIR CAPTURE.*—*The testing and evaluation phase of the Program may include demonstration projects for direct air capture to produce fuels for use—*

(A) at military installations or facilities of the Department of Defense; or

(B) in modes of transportation by the Navy or the Coast Guard.

(3) *COMMENCEMENT.*—*Subject to subsection (a)(3)(B), the Secretary shall commence carrying out the testing and evaluation phase of the Program on the date of the completion of the research and development phase described in subsection (b), except that the testing and evaluation phase of the Program with respect to direct air capture may commence at such time after a front end engineering and design study demonstrates to the Secretary that commencement of such phase is appropriate.*

(4) *GRANTS AUTHORIZED.*—*The Secretary may carry out the testing and evaluation phase of the Program through the award of grants to private persons and eligible laboratories.*

(5) *LOCATIONS.*—*The Secretary shall carry out the testing and evaluation phase of the Program at military installations or facilities of the Department of Defense.*

(6) *REPORT REQUIRED.*—*Not later than September 30, 2026, the Secretary shall submit to Congress a report on the findings of the Secretary with respect to the effectiveness of the technologies tested and evaluated under the Program.*

(d) *DEFINITIONS.*—*In this section:*

(1) *The term “blue carbon capture” means the removal of dissolved carbon dioxide from seawater through engineered or inorganic processes, including filters, membranes, or phase change systems.*

(2)(A) *The term “direct air capture”, with respect to a facility, technology, or system, means that the facility, technology, or system uses carbon capture equipment to capture carbon dioxide directly from the air.*

(B) *The term “direct air capture” does not include any facility, technology, or system that captures carbon dioxide—*

(i) that is deliberately released from a naturally occurring subsurface spring; or

(ii) using natural photosynthesis.

(3) *The term “eligible laboratory” means—*

(A) a National Laboratory (as defined in section 2 of the Energy Policy Act of 2005 (42 U.S.C. 15801));

(B) a science and technology reinvention laboratory designated under section 1105 of the National Defense Authorization Act for Fiscal Year 2010 (Public Law 111–84; 10 U.S.C. 2358 note);

(C) the Major Range and Test Facility Base (as defined in section 2358a(f) of title 10, United States Code); or

(D) any other facility that supports the research, development, test, and evaluation activities of the Department of Defense or the Department of Energy.

SEC. 224. REQUIRING DEFENSE MICROELECTRONICS PRODUCTS AND SERVICES MEET TRUSTED SUPPLY CHAIN AND OPERATIONAL SECURITY STANDARDS.

(a) *PURCHASES.*—To protect the United States from intellectual property theft and to ensure national security and public safety in the application of new generations of wireless network technology and microelectronics, beginning no later than January 1, 2023, the Secretary of Defense shall ensure that each microelectronics product or service that the Department of Defense purchases on or after such date meets the applicable trusted supply chain and operational security standards established pursuant to subsection (b), except in a case in which the Department seeks to purchase a microelectronics product or service but—

(1) no such product or service is available for purchase that meets such standards; or

(2) no such product or service is available for purchase that—

(A) meets such standards; and

(B) is available at a price that the Secretary does not consider prohibitively expensive.

(b) *TRUSTED SUPPLY CHAIN AND OPERATIONAL SECURITY STANDARDS.*—

(1) *STANDARDS REQUIRED.*—(A) Not later than January 1, 2021, the Secretary shall establish trusted supply chain and operational security standards for the purchase of microelectronics products and services by the Department.

(B) For purposes of this section, a trusted supply chain and operational security standard—

(i) is a standard that systematizes best practices relevant to—

(I) manufacturing location;

(II) company ownership;

(III) workforce composition;

(IV) access during manufacturing, suppliers' design, sourcing, manufacturing, packaging, and distribution processes;

(V) reliability of the supply chain; and

(VI) other matters germane to supply chain and operational security; and

(ii) is not a military standard (also known as "MIL-STD") or a military specification (also known as "MIL-SPEC") for microelectronics that—

(I) specifies individual features for Department of Defense microelectronics; or

(II) otherwise inhibits the acquisition by the Department of securely manufactured, commercially-available products.

(2) *CONSULTATION REQUIRED.*—In developing standards under paragraph (1), the Secretary shall consult with the following:

(A) The Secretary of Homeland Security, the Secretary of State, the Secretary of Commerce, and the Director of the National Institute of Standards and Technology.

(B) Suppliers of microelectronics products and services from the United States and allies and partners of the United States.

(C) Representatives of major United States industry sectors that rely on a trusted supply chain and the operational security of microelectronics products and services.

(D) Representatives of the United States insurance industry.

(3) **TIERS OF TRUST AND LEVELS OF SECURITY AUTHORIZED.**—In carrying out paragraph (1), the Secretary may establish tiers and levels of trust and security within the supply chain and operational security standards for microelectronics products and services.

(4) **GENERAL APPLICABILITY.**—The standards established pursuant to paragraph (1) shall be, to the greatest extent practicable, generally applicable to the trusted supply chain and operational security needs and use cases of the United States Government and commercial industry, such that the standards could be widely adopted by government agencies, commercial industry, and allies and partners of the United States as the basis for procuring microelectronics products and services.

(5) **ANNUAL REVIEW.**—Not later than October 1 of each year, the Secretary shall, in consultation with persons and entities set forth under paragraph (2), review the standards established pursuant to paragraph (1) and issue updates or modifications as the Secretary considers necessary or appropriate.

(c) **ENSURING ABILITY TO SELL COMMERCIALY.**—

(1) **IN GENERAL.**—The Secretary shall, to the greatest extent practicable, ensure that suppliers of microelectronics products and services for the Department of Defense subject to subsection (a) are able and incentivized to sell products commercially and to governments of allies and partners of the United States that are produced on the same production lines as the microelectronics products supplied to the Department of Defense.

(2) **EFFECT OF REQUIREMENTS AND ACQUISITIONS.**—The Secretary shall, to the greatest extent practicable, ensure that the requirements of the Department and the acquisition by the Department of microelectronics enable the success of a dual-use microelectronics industry.

(d) **MAINTAINING COMPETITION AND INNOVATION.**—The Secretary shall take such actions as the Secretary considers necessary and appropriate, within the Secretary's authorized activities to maintain the health of the defense industrial base, to ensure that—

(1) providers of microelectronics products and services that meet the standards established under subsection (b) are exposed to competitive market pressures to achieve competitive pricing and sustained innovation; and

(2) the industrial base of microelectronics products and services that meet the standards established under subsection (b) includes providers manufacturing in the United States or in countries that are allies or partners of the United States.

SEC. 225. DEVELOPMENT AND ACQUISITION STRATEGY TO PROCURE SECURE, LOW PROBABILITY OF DETECTION DATA LINK NETWORK CAPABILITY.

(a) **STRATEGY REQUIRED.**—Not later than March 1, 2020, the Chief of Staff of the Air Force, the Chief of Naval Operations, and the Chief of Staff of the Army shall jointly submit to the congressional defense committees a joint development and acquisition strat-

egy to procure a secure, low probability of detection data link network capability, with the ability to effectively operate in hostile jamming environments while preserving the low observability characteristics of the relevant platforms, including both existing and planned platforms.

(b) **NETWORK CHARACTERISTICS.**—The data link network capability to be procured pursuant to the development and acquisition strategy submitted under subsection (a) shall—

(1) ensure that any network made with such capability will be low risk and affordable, with minimal impact or change to existing host platforms and minimal overall integration costs;

(2) use a non-proprietary and open systems approach compatible with the Rapid Capabilities Office Open Mission Systems initiative of the Air Force, the Future Airborne Capability Environment initiative of the Navy, and the Modular Open Systems Architecture initiative of the Army; and

(3) provide for an architecture to connect, with operationally relevant throughput and latency—

(A) fifth-generation combat aircraft;

(B) fifth-generation and fourth-generation combat aircraft;

(C) fifth-generation and fourth-generation combat aircraft and appropriate support aircraft and other network nodes for command, control, communications, intelligence, surveillance, and reconnaissance purposes; and

(D) fifth-generation and fourth-generation combat aircraft and their associated network-enabled precision weapons.

(c) **LIMITATION.**—Of the funds authorized to be appropriated by this Act for fiscal year 2020 for operation and maintenance for the Office of the Secretary of the Air Force, for operation and maintenance for the Office of the Secretary of the Navy, and for operations and maintenance for the Office of the Secretary of the Army, not more than 50 percent may be obligated or expended until the date that is 15 days after the date on which the Chief of Staff of the Air Force, the Chief of Naval Operations, and the Chief of Staff of the Army, respectively, submit the development and acquisition strategy required by subsection (a).

SEC. 226. ESTABLISHMENT OF SECURE NEXT-GENERATION WIRELESS NETWORK (5G) INFRASTRUCTURE FOR THE NEVADA TEST AND TRAINING RANGE AND BASE INFRASTRUCTURE.

(a) **ESTABLISHMENT REQUIRED.**—Not later than one year after the date of the enactment of this Act, the Secretary of Defense shall establish secure fifth-generation wireless network components and capabilities at no fewer than two Department of Defense installations in accordance with this section.

(b) **INSTALLATIONS.**—

(1) **LOCATIONS.**—The Secretary shall establish components and capabilities under subsection (a) at the following:

(A) The Nevada Test and Training Range, which shall serve as a Major Range and Test Facility Base (MRTFB) for fifth-generation wireless networking.

(B) Such Department installations or other installations as the Secretary considers appropriate for the purpose set forth in paragraph (2).

(2) *PURPOSE.*—The purpose of the establishment of components and capabilities under subsection (a) at the locations described in paragraph (1) of this subsection is to demonstrate the following:

(A) *The potential military utility of high bandwidth, scalable, and low latency fifth-generation wireless networking technology.*

(B) *Advanced security technology that is applicable to fifth-generation networks as well as legacy Department command and control networks.*

(C) *Secure interoperability with fixed and wireless systems (legacy and future systems).*

(D) *Enhancements such as spectrum and waveform diversity, frequency hopping and spreading, and beam forming for military requirements.*

(E) *Technology for dynamic network slicing for specific use cases and applications requiring varying levels of latency, scale, and throughput.*

(F) *Technology for dynamic spectrum sharing and network isolation.*

(G) *Base infrastructure installation of high bandwidth, scalable, and low latency fifth-generation wireless networking technology.*

(H) *Applications for secure fifth-generation wireless network capabilities for the Department, such as the following:*

(i) *Interactive augmented reality or synthetic training environments.*

(ii) *Internet of things devices.*

(iii) *Autonomous systems.*

(iv) *Advanced manufacturing through the following:*

(I) *Department-sponsored centers for manufacturing innovation (as defined in section 34(c) of the National Institute of Standards and Technology Act (15 U.S.C. 278s(c))).*

(II) *Department research and development organizations.*

(III) *Manufacturers in the defense industrial base of the United States.*

SEC. 227. ADMINISTRATION OF MANUFACTURING INNOVATION INSTITUTES FUNDED BY THE DEPARTMENT OF DEFENSE.

(a) *IN GENERAL.*—The Secretary of Defense shall make such changes to the administration of covered institutes so as—

(1) *to encourage covered institutes to leverage existing workforce development programs across the Federal Government and State governments in order to build successful workforce development programs;*

(2) *to develop metrics to evaluate the workforce development performed by the covered institutes, including metrics on job quality, career pathways, wages and benefits, and efforts to support veterans, and progress in aligning workforce skillsets with the current and long-term needs of the Department of Defense and the defense industrial base;*

(3) to allow metrics to vary between covered institutes and be updated and evaluated continuously in order to more accurately evaluate covered institutes with different goals and missions;

(4) to encourage covered institutes to consider developing technologies that were previously funded by Federal Government investment for early-stage research and development and expand cross-government coordination and collaboration to achieve this goal;

(5) to provide an opportunity for increased Department of Defense input and oversight from senior-level military and civilian personnel on future technology roadmaps produced by covered institutes;

(6) to reduce the barriers to collaboration between and among multiple covered institutes;

(7) to use contracting vehicles that can increase flexibility, reduce barriers for contracting with subject-matter experts and small and medium enterprises, enhance partnerships between covered institutes, and reduce the time to award contracts at covered institutes; and

(8) to overcome barriers to the adoption of manufacturing processes and technologies developed by the covered institutes by the defense and commercial industrial base, particularly small and medium enterprises, by engaging with public and private sector partnerships and appropriate government programs and activities, including the Hollings Manufacturing Extension Partnership.

(b) **COORDINATION WITH OTHER ACTIVITIES.**—The Secretary shall carry out this section in coordination with activities undertaken under—

(1) the Manufacturing Technology Program established under section 2521 of title 10, United States Code;

(2) the Manufacturing Engineering Education Program established under section 2196 of such title;

(3) the Defense Manufacturing Community Support Program established under section 846 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232);

(4) manufacturing initiatives of the Secretary of Commerce, the head of the National Office of the Manufacturing USA Network, the Secretary of Energy, and such other government and private sector organizations as the Secretary of Defense considers appropriate; and

(5) such other activities as the Secretary considers appropriate.

(c) **DEFINITION OF COVERED INSTITUTE.**—In this section, the term “covered institute” means a manufacturing innovation institute that is funded by the Department of Defense.

SEC. 228. RESEARCH PROGRAM ON FOREIGN MALIGN INFLUENCE OPERATIONS.

(a) **PROGRAM AUTHORIZED.**—The Secretary of Defense, acting through the Under Secretary of Defense for Research and Engineering, may carry out a research program on foreign malign influence operations as part of the university research programs of the Department of Defense.

(b) *PROGRAM OBJECTIVES.*—The objectives of a research program carried out under subsection (a) should include the following:

(1) *Enhance the understanding of foreign malign influence operations, including activities conducted on social media platforms.*

(2) *Facilitate the analysis of publicly available or voluntarily provided indicators of foreign malign influence operations.*

(3) *Promote collaborative research and information exchange with relevant entities within the Department of Defense and with other agencies or nongovernmental organizations relating to foreign malign influence operations, as appropriate.*

(c) *NOTICE TO CONGRESS.*—Not later than 30 days before initiating a research program under subsection (a), the Secretary of Defense shall submit to the congressional defense committees notice of the intent of the Secretary to initiate such a program, which shall include—

(1) *a detailed description of the program and any related research activities;*

(2) *the estimated cost and duration of the program; and*

(3) *any other matters the Secretary determines to be relevant.*

SEC. 229. DIVERSIFICATION OF THE RESEARCH AND ENGINEERING WORKFORCE OF THE DEPARTMENT OF DEFENSE.

(a) *ASSESSMENT REQUIRED.*—

(1) *IN GENERAL.*—The Secretary of Defense, acting through the Under Secretary of Defense for Research and Engineering and in consultation with the Under Secretary of Defense for Personnel and Readiness, shall conduct an assessment of critical skillsets required across, and the diversity of, the research and engineering workforce of the Department of Defense, including the science and technology reinvention laboratories, to support emerging and future warfighter technologies.

(2) *ELEMENTS.*—The assessment required by paragraph (1) shall include analysis of the following:

(A) *The percentage of women and minorities employed in the research and engineering workforce of the Department of Defense as of the date of the assessment.*

(B) *Of the individuals hired into the research and engineering workforce of the Department in the five years preceding the date of the assessment, the percentage of such individuals who are women and minorities.*

(C) *The effectiveness of existing hiring, recruitment, and retention incentives for women and minorities in the research and engineering workforce of the Department.*

(D) *The effectiveness of the Department in recruiting women and minorities into the laboratory workforce after such individuals complete work on Department-funded research, projects, grant projects, fellowships, and STEM programs.*

(E) *The geographical diversity of the workforce across various geographic regions.*

(b) *PLAN REQUIRED.*—

(1) *IN GENERAL.*—Based on the results of the assessment conducted under subsection (a), the Secretary of Defense, acting

through the Under Secretary of Defense for Research and Engineering and in consultation with the Secretaries of the military departments, shall develop and implement a plan to diversify and strengthen the research and engineering workforce of the Department of Defense.

(2) *ELEMENTS.*—The plan required by paragraph (1) shall—

(A) align with science and technology strategy priorities of the Department of Defense, including the emerging and future warfighter technology requirements identified by the Department;

(B) except as provided in subsection (c)(2), set forth steps for the implementation of each recommendation included in the 2013 report of the RAND corporation titled “First Steps Toward Improving DoD STEM Workforce Diversity”;

(C) harness the full range of the Department’s STEM programs and other Department sponsored programs to develop and attract top talent;

(D) use existing authorities to attract and retain students, academics, and other talent;

(E) establish and use contracts, agreements, or other arrangements with institutions of higher education (as defined in section 101 of the Higher Education Act of 1965 (20 U.S.C. 1001)), including historically black colleges and universities and other minority-serving institutions (as described in section 371(a) of such Act (20 U.S.C. 1067q(a)) to enable easy and efficient access to research and researchers for Government sponsored basic and applied research and studies at each institution, including contracts, agreements, and other authorized arrangements such as those authorized under—

(i) section 217 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 10 U.S.C. 2358 note); and

(ii) such other authorities as the Secretary determines to be appropriate; and

(F) include recommendations for changes in authorities, regulations, policies, or any other relevant areas that would support the achievement of the goals set forth in the plan.

(3) *SUBMITTAL TO CONGRESS.*—Not later than one year after the date of the enactment of this Act, the Secretary of Defense shall submit to the congressional defense committees a report that includes—

(A) the plan developed under paragraph (1); and

(B) with respect to each recommendation described in paragraph (2)(B) that the Secretary has implemented or expects to implement—

(i) a summary of actions that have been taken to implement the recommendation; and

(ii) a schedule, with specific milestones, for completing the implementation of the recommendation.

(c) *DEADLINE FOR IMPLEMENTATION.*—

(1) *IN GENERAL.*—Except as provided in paragraph (2), not later than 18 months after the date of the enactment of this Act the Secretary of Defense shall carry out activities to implement the plan developed under subsection (b).

(2) *EXCEPTION FOR IMPLEMENTATION OF CERTAIN RECOMMENDATIONS.*—

(A) *DELAYED IMPLEMENTATION.*—The Secretary of Defense may commence implementation of a recommendation described in subsection (b)(2)(B) after the date specified in paragraph (1) if the Secretary provides the congressional defense committees with a specific justification for the delay in implementation of such recommendation on or before such date.

(B) *NONIMPLEMENTATION.*—The Secretary of Defense may opt not to implement a recommendation described in subsection (b)(2)(B) if the Secretary provides to the congressional defense committees, on or before the date specified in paragraph (1)—

(i) a specific justification for the decision not to implement the recommendation; and

(ii) a summary of the alternative actions the Secretary plans to take to address the issues underlying the recommendation.

(d) *STEM DEFINED.*—In this section, the term “STEM” means science, technology, engineering, and mathematics.

SEC. 230. POLICY ON THE TALENT MANAGEMENT OF DIGITAL EXPERTISE AND SOFTWARE PROFESSIONALS.

(a) *POLICY.*—

(1) *IN GENERAL.*—It shall be a policy of the Department of Defense to promote and maintain digital expertise and software development as core competencies of civilian and military workforces of the Department, and as a capability to support the National Defense Strategy, which policy shall be achieved by—

(A) the recruitment, development, and incentivization of retention in and to the civilian and military workforce of the Department of individuals with aptitude, experience, proficient expertise, or a combination thereof in digital expertise and software development;

(B) at the discretion of the Secretaries of the military departments, the development and maintenance of civilian and military career tracks related to digital expertise, and related digital competencies for members of the Armed Forces, including the development and maintenance of training, education, talent management, incentives, and promotion policies in support of members at all levels of such career tracks; and

(C) the development and application of appropriate readiness standards and metrics to measure and report on the overall capability, capacity, utilization, and readiness of digital engineering professionals to develop and deliver operational capabilities and employ modern business practices.

(2) *DIGITAL ENGINEERING DEFINED.*—For purposes of this section, the term “digital engineering” means the discipline and

set of skills involved in the creation, processing, transmission, integration, and storage of digital data, including data science, machine learning, software engineering, software product management, and artificial intelligence product management.

(b) **IMPLEMENTATION PLAN.**—Not later than May 1, 2020, the Secretary of Defense shall submit to the Committees on Armed Services of the Senate and the House of Representatives a plan that describes how the Department of Defense will execute the policy described in subsection (a).

(c) **RESPONSIBILITY.**—

(1) **APPOINTMENT OF OFFICER.**—Not later than 270 days after the date of enactment of this Act, the Secretary of Defense may appoint a civilian official responsible for the development and implementation of the policy and implementation plan set forth in subsections (a) and (b), respectively. The official shall be known as the “Chief Digital Engineering Recruitment and Management Officer of the Department of Defense”.

(2) **EXPIRATION OF APPOINTMENT.**—The appointment of the Officer under paragraph (1) shall expire on September 30, 2024.

SEC. 231. DIGITAL ENGINEERING CAPABILITY TO AUTOMATE TESTING AND EVALUATION.

(a) **DIGITAL ENGINEERING CAPABILITY.**—

(1) **IN GENERAL.**—The Secretary of Defense shall establish a digital engineering capability to be used—

(A) for the development and deployment of digital engineering models for use in the defense acquisition process; and

(B) to provide testing infrastructure and software to support automated approaches for testing, evaluation, and deployment throughout the defense acquisition process.

(2) **REQUIREMENTS.**—The capability developed under subsection (a) shall meet the following requirements:

(A) The capability will be accessible to, and useable by, individuals throughout the Department of Defense who have responsibilities relating to capability design, development, testing, evaluation, and operation.

(B) The capability will provide for the development, validation, use, curation, and maintenance of technically accurate digital systems, models of systems, subsystems, and their components, at the appropriate level of fidelity to ensure that test activities adequately simulate the environment in which a system will be deployed.

(C) The capability will include software to automate testing throughout the program life cycle, including to satisfy developmental test requirements and operational test requirements. Such software may be developed in accordance with the authorities provided under section 800, and shall support—

(i) security testing that includes vulnerability scanning and penetration testing performed by individuals, including threat-based red team exploitations and assessments with zero-trust assumptions; and

(ii) high-confidence distribution of software to the field on a time-bound, repeatable, frequent, and iterative basis.

(b) *DEMONSTRATION ACTIVITIES.*—

(1) *IN GENERAL.*—In developing the capability required under subsection (a), the Secretary of Defense shall carry out activities to demonstrate digital engineering approaches to automated testing that—

(A) enable continuous software development and delivery;

(B) satisfy developmental test requirements for the software-intensive programs of the Department of Defense; and

(C) satisfy operational test and evaluation requirements for such programs.

(2) *PROGRAM SELECTION.*—Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense shall assess and select not fewer than four and not more than ten programs of the Department of Defense to participate in the demonstration activities under paragraph (1), including—

(A) at least one program participating in the pilot program authorized under section 873 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 10 U.S.C. 2223a note);

(B) at least one program participating in the pilot program authorized under section 874 of such Act (Public Law 115–91; 10 U.S.C. 2302 note);

(C) at least one major defense acquisition program (as defined in section 2430 of title 10, United States Code);

(D) at least one command and control program;

(E) at least one defense business system (as defined in section 2222(i) of title 10, United States Code); and

(F) at least one program from each military service.

(3) *ADDITIONAL REQUIREMENTS.*—As part of the demonstration activities under paragraph (1), the Secretary shall—

(A) conduct a comparative analysis that assesses the risks and benefits of the digital engineering supported automated testing approaches of the programs participating in the demonstration activities relative to traditional testing approaches that are not supported by digital engineering;

(B) ensure that the intellectual property strategy for each of the programs participating in the demonstration activities is best aligned to meet the goals of the program; and

(C) develop a workforce and infrastructure plan to support any new policies and guidance implemented in connection with the demonstration activities, including any policies and guidance implemented after the completion of such activities.

(c) *POLICIES AND GUIDANCE REQUIRED.*—Not later than one year after the date of the enactment of this Act, based on the results of the demonstration activities carried out under subsection (b), the Secretary of Defense shall issue or modify policies and guidance to—

(1) promote the use of digital engineering capabilities for development and for automated testing; and

(2) address roles, responsibilities, and procedures relating to such capabilities.

(d) *STEERING COMMITTEE.*—

(1) *IN GENERAL.*—The Secretary of Defense shall establish a steering committee to assist the Secretary in carrying out subsections (a) through (c).

(2) *MEMBERSHIP.*—The steering committee shall be composed of the following members or their designees:

(A) The Under Secretary of Defense for Research and Engineering.

(B) The Under Secretary of Defense for Acquisition and Sustainment.

(C) The Chief Information Officer.

(D) The Director of Operational Test and Evaluation.

(E) The Director of Cost Assessment and Program Evaluation.

(F) The Service Acquisition Executives.

(G) The Service testing commands.

(H) The Director of the Defense Digital Service.

(e) *REPORTS REQUIRED.*—

(1) *IMPLEMENTATION.*—Not later than March 15, 2020, the Secretary of Defense shall submit to the congressional defense committees a report on the progress of the Secretary in implementing subsections (a) through (c). The report shall include an explanation of how the results of the demonstration activities carried out under subsection (b) will be incorporated into the policy and guidance required under subsection (c), particularly the policy and guidance of the members of the steering committee established under subsection (d).

(2) *LEGISLATIVE RECOMMENDATIONS.*—Not later than October 15, 2020, the Secretary of Defense shall provide to the congressional defense committees a briefing that identifies any changes to existing law that may be necessary to facilitate the implementation of subsections (a) through (c).

(f) *INDEPENDENT ASSESSMENT.*—

(1) *IN GENERAL.*—Not later than March 15, 2021, the Defense Innovation Board and the Defense Science Board shall jointly complete an independent assessment of the progress of the Secretary in implementing subsections (a) through (c). The Secretary of Defense shall ensure that the Defense Innovation Board and the Defense Science Board have access to the resources, data, and information necessary to complete the assessment.

(2) *INFORMATION TO CONGRESS.*—Not later than 30 days after the date on which the assessment under paragraph (1) is completed, the Defense Innovation Board and the Defense Science Board shall jointly provide to the congressional defense committees—

(A) a report summarizing the assessment; and

(B) a briefing on the findings of the assessment.

SEC. 232. PROCESS TO ALIGN POLICY FORMULATION AND EMERGING TECHNOLOGY DEVELOPMENT.

(a) *ALIGNMENT OF POLICY AND TECHNOLOGICAL DEVELOPMENT.*—Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense shall establish a process to ensure that the policies of the Department of Defense relating to emerging technology are formulated and updated continuously as such technology is developed by the Department.

(b) *ELEMENTS.*—As part of the process established under subsection (a), the Secretary shall—

(1) specify the role of each covered official in ensuring that the formulation of policies relating to emerging technology is carried out concurrently with the development of such technology; and

(2) incorporate procedures for the continuous legal review of—

(A) weapons and other defense systems that incorporate or use emerging technology; and

(B) treaties that may be affected by such technology.

(c) *BRIEFING REQUIRED.*—Not later than 30 days after the date on which the Secretary of Defense establishes the process required under subsection (a), the Secretary shall provide to the congressional defense committees a briefing on such process.

(d) *DEFINITIONS.*—In this section:

(1) The term “covered official” means the following:

(A) The Chairman of the Joint Chiefs of Staff.

(B) The Under Secretary of Defense for Research and Engineering.

(C) The Under Secretary of Defense for Acquisition and Sustainment.

(D) The Under Secretary of Defense for Policy.

(E) The commanders of combatant commands with responsibilities involving the use of weapons or other defense systems that incorporate or use emerging technology, as determined by the Secretary of Defense.

(F) The Secretaries of the military departments.

(2) The term “emerging technology” means technology determined to be in an emerging phase of development by the Secretary of Defense, including quantum computing, technology for the analysis of large and diverse sets of data (commonly known as “big data analytics”), artificial intelligence, autonomous technology, robotics, directed energy, hypersonics, biotechnology, and such other technology as may be identified by the Secretary.

SEC. 233. IMPROVEMENT OF THE STRATEGIC CAPABILITIES OFFICE OF THE DEPARTMENT OF DEFENSE.

(a) *ORGANIZATION.*—

(1) *AUTHORITY OF DEPUTY SECRETARY OF DEFENSE.*—The Deputy Secretary of Defense shall exercise authority and direction over the Strategic Capabilities Office of the Department of Defense (referred to in this section as the “Office”).

(2) *AUTHORITY OF DIRECTOR.*—The Director of the Office shall report directly to the Deputy Secretary of Defense.

(3) *DELEGATION.*—In exercising authority and direction over the Office under subsection (a), the Deputy Secretary of Defense may delegate administrative, management, and other duties to the Director of the Defense Advanced Research Projects Agency, as needed, to effectively and efficiently execute the mission of the Office.

(b) *CROSS-FUNCTIONAL TEAMS.*—

(1) *ESTABLISHMENT.*—Not later than 180 days after the date of enactment of this Act, the Deputy Secretary of Defense

shall establish the following cross-functional teams to improve the effectiveness of the Office:

(A) A transition cross-functional team to improve the efficiency and effectiveness with which the programs of the Office may be transitioned into—

(i) research and development programs of the military services and other agencies of the Department of Defense; and

(ii) programs of such services and agencies in operational use.

(B) A technical cross functional team to improve the continuous technical assessment and review of the programs of the Office during program selection and execution.

(2) MEMBERSHIP.—The Deputy Secretary of Defense shall select individuals to serve on the cross-functional teams described in paragraph (1) from among individuals in the defense research and engineering enterprise, acquisition community, Joint Staff, combatant commands, and other organizations, as determined to be appropriate by the Deputy Secretary.

SEC. 234. PILOT PROGRAM ON ENHANCED CIVICS EDUCATION.

(a) IN GENERAL.—The Secretary of Defense, in consultation with the Secretary of Education, shall carry out a pilot program under which the Secretary provides enhanced educational support and funding to eligible entities to improve civics education programs taught by such entities.

(b) PURPOSE.—The purpose of the pilot program is to provide enhanced civics education on the following topics:

(1) Critical thinking and media literacy.

(2) Voting and other forms of political and civic engagement.

(3) Interest in employment, and careers, in public service.

(4) Understanding of United States law, history, and Government.

(5) The ability of participants to collaborate and compromise with others to solve problems.

(c) CONSIDERATIONS.—In carrying out the pilot program, the Secretary of Defense shall consider innovative approaches for improving civics education.

(d) METRICS AND EVALUATIONS.—The Secretary of Defense shall establish metrics and undertake evaluations to determine the effectiveness of the pilot program, including each of the activities carried out under subsection (e).

(e) TYPES OF SUPPORT AUTHORIZED.—Under the pilot program the Secretary of Defense—

(1) shall provide support to eligible entities to address, at a minimum—

(A) the development or modification of curricula relating to civics education;

(B) classroom activities, thesis projects, individual or team projects, internships, or community service activities relating to civics;

(C) collaboration with government entities, nonprofit organizations, or consortia of such entities and organizations to provide participants with civics-related experiences;

(D) civics-related faculty development programs;

(E) recruitment of educators who are highly qualified in civics education to teach civics or to assist with the development of curricula for civics education;

(F) presentation of seminars, workshops, and training for the development of skills associated with civic engagement;

(G) activities that enable participants to interact with government officials and entities;

(H) expansion of civics education programs and outreach for members of the Armed Forces, dependents and children of such members, and employees of the Department of Defense; and

(I) opportunities for participants to obtain work experience in fields relating to civics; and

(2) may provide any other form of support the Secretary determines to be appropriate to enhance the civics education taught by eligible entities.

(f) **REPORT.**—Not later than 180 days after the conclusion of the first full academic year during which the pilot program is carried out, the Secretary of Defense shall submit to the congressional defense committees a report that includes—

(1) a description of the pilot program, including the a description of the specific activities carried out under subsection (e); and

(2) the metrics and evaluations used to assess the effectiveness of the program as required under subsection (d).

(g) **DEFINITIONS.**—In this section:

(1) The term “civics education program” means an educational program that provides participants with—

(A) knowledge of law, government, and the rights of citizens; and

(B) skills that enable participants to responsibly participate in democracy.

(2) The term “eligible entity” means any of following:

(A) A local education agency that hosts a unit of the Junior Reserve Officers’ Training Corps.

(B) A school operated by the Department of Defense Education Activity.

SEC. 235. TECHNOLOGY AND NATIONAL SECURITY FELLOWSHIP.

(a) **FELLOWSHIP PROGRAM.**—

(1) **IN GENERAL.**—The Secretary of Defense, acting through the Under Secretary of Defense for Research and Engineering, may establish a civilian fellowship program designed to place eligible individuals within the Department of Defense and Congress to increase the number of national security professionals with science, technology, engineering, and mathematics credentials employed by the Department.

(2) **DESIGNATION.**—The fellowship program established under paragraph (1) shall be known as the “Technology and National Security Fellowship” (in this section referred to as the “fellows program”).

(3) **ASSIGNMENTS.**—Each individual selected for participation in the fellows program shall be assigned to a one year position within—

(A) the Department of Defense; or

(B) a congressional office with emphasis on defense and national security matters.

(4) PAY AND BENEFITS.—To the extent practicable, each individual assigned to a position under paragraph (3)—

(A) shall be compensated at a rate of basic pay that is equivalent to the rate of basic pay payable for a position at level 10 of the General Schedule; and

(B) shall be treated as an employee of the United States during the assignment.

(b) ELIGIBLE INDIVIDUALS.—

(1) ELIGIBILITY FOR DOD ASSIGNMENT.—Subject to subsection (e), an individual eligible for an assignment in the Department of Defense under subsection (a)(3)(A) is an individual who—

(A) is a citizen of the United States; and

(B) either—

(i) expects to be awarded a bachelor's degree, associate's degree, or graduate degree that, as determined by the Secretary, focuses on science, technology, engineering, or mathematics course work not later than 180 days after the date on which the individual submits an application for participation in the fellows program;

(ii) possesses a bachelor's degree, associate's degree, or graduate degree that, as determined by the Secretary, focuses on science, technology, engineering, or mathematics course work; or

(iii) is an employee of the Department of Defense and possesses a bachelor's degree, associate's degree, or graduate degree that, as determined by the Secretary, focuses on science, technology, engineering, or mathematics course work.

(2) ELIGIBILITY FOR CONGRESSIONAL ASSIGNMENT.—Subject to subsection (e), an individual eligible for an assignment in a congressional office under subsection (a)(3)(B) is an individual who—

(A) meets the requirements specified in paragraph (1); and

(B) has not less than 3 years of relevant work experience in the field of science, technology, engineering, or mathematics.

(c) APPLICATION.—Each individual seeking to participate in the fellows program shall submit to the Secretary an application therefor at such time and in such manner as the Secretary shall specify.

(d) COORDINATION.—In carrying out this section, the Secretary may consider working through the following entities:

(1) The National Security Innovation Network.

(2) Universities.

(3) Science and technology reinvention laboratories and test and evaluation centers of the Department of Defense.

(4) Other organizations of the Department of Defense or public and private sector organizations, as determined appropriate by the Secretary.

(e) MODIFICATIONS TO FELLOWS PROGRAM.—The Secretary may modify the terms and procedures of the fellows program in order to

better achieve the goals of the program and to support workforce needs of the Department of Defense.

(f) *CONSULTATION.*—The Secretary may consult with the heads of the agencies, components, and other elements of the Department of Defense, Members and committees of Congress, and such institutions of higher education and private entities engaged in work on national security and emerging technologies as the Secretary considers appropriate for purposes of the fellows program, including with respect to assignments in the fellows program.

SEC. 236. DOCUMENTATION RELATING TO THE ADVANCED BATTLE MANAGEMENT SYSTEM.

(a) *DOCUMENTATION REQUIRED.*—Not later than the date specified in subsection (b), the Secretary of the Air Force shall submit to the congressional defense committees the following documentation relating to the Advanced Battle Management System:

(1) A list that identifies each program, project, and activity that contributes to the architecture of the Advanced Battle Management System.

(2) The final analysis of alternatives for the Advanced Battle Management System.

(3) The requirements for the networked data architecture necessary for the Advanced Battle Management System to provide multidomain command and control and battle management capabilities and a development schedule for such architecture.

(b) *DATE SPECIFIED.*—The date specified in this subsection is the earlier of—

(1) the date that is 180 days after the date on which the final analysis of alternatives for the Advanced Battle Management System is completed; or

(2) June 1, 2020.

(c) *ADVANCED BATTLE MANAGEMENT SYSTEM DEFINED.*—In this section, the term “Advanced Battle Management System” means the Advanced Battle Management System of Systems capability of the Air Force, including each program, project, and activity that contributes to such capability.

SEC. 237. SENSOR DATA INTEGRATION FOR FIFTH GENERATION AIRCRAFT.

(a) *F-35 SENSOR DATA.*—The Secretary of Defense shall ensure that—

(1) information collected by the passive and active on-board sensors of the F-35 Joint Strike Fighter aircraft is capable of being shared, in real time, with joint service users in cases in which the Joint Force Commander determines that sharing such information would be operationally advantageous; and

(2) the Secretary has developed achievable, effective, and suitable concepts and supporting technical architectures to collect, store, manage, and disseminate information collected by such sensors.

(b) *GAO STUDY AND REPORT.*—

(1) *STUDY.*—The Comptroller General of the United States shall conduct a study of the sensor data collection and dissemination capability of fifth generation aircraft of the Department of Defense.

(2) *ELEMENTS.*—The study required by paragraph (1) shall include an assessment of the following—

(A) the extent to which the Department has established doctrinal, organizational, or technological methods of managing the large amount of sensor data that is currently collected and which may be collected by existing and planned advanced fifth generation aircraft;

(B) the status of the existing sensor data collection, storage, dissemination, and management capability and capacity of fifth generation aircraft, including the F-35, the F-22, and the B-21; and

(C) the ability of the F-35 aircraft and other fifth generation aircraft to share information collected by the aircraft in real-time with other joint service users as described in subsection (a)(1).

(3) *STUDY RESULTS.*—

(A) *INTERIM BRIEFING.*—Not later than 180 days after the date of the enactment of this Act, the Comptroller General shall provide to the congressional defense committees a briefing on the preliminary findings of the study conducted under this subsection.

(B) *FINAL RESULTS.*—The Comptroller General shall provide the final results of the study conducted under this subsection to the congressional defense committees at such time and in such format as is mutually agreed upon by the committees and the Comptroller General at the time of the briefing under subparagraph (A).

SEC. 238. SENSE OF CONGRESS ON FUTURE VERTICAL LIFT TECHNOLOGIES.

It is the sense of Congress that the Army should continue to invest in research, development, test, and evaluation programs to mature future vertical lift technologies, including programs to improve pilot situational awareness, increase flight operations safety, and reduce operation and maintenance costs.

SEC. 239. USE OF FUNDS FOR STRATEGIC ENVIRONMENTAL RESEARCH PROGRAM, ENVIRONMENTAL SECURITY TECHNICAL CERTIFICATION PROGRAM, AND OPERATIONAL ENERGY CAPABILITY IMPROVEMENT.

Of the funds authorized to be appropriated for fiscal year 2020 for the use of the Department of Defense for research, development, test, and evaluation, as specified in the funding table in section 4201 for the Strategic Environmental Research Program, Operational Energy Capability Improvement, and the Environmental Security Technical Certification Program, the Secretary of Defense shall, acting through the Under Secretary of Defense for Acquisition and Sustainment, expend amounts as follows:

(1) *Not less than \$10,000,000 on the development and demonstration of long duration on-site energy battery storage for distributed energy assets.*

(2) *Not less than \$10,000,000 on the development, demonstration, and validation of non-fluorine based firefighting foams.*

(3) *Not less than \$10,000,000 on the development, demonstration, and validation of secure microgrids for both installations and forward operating bases.*

(4) *Not less than \$1,000,000 on the development, demonstration, and validation of technologies that can harvest potable water from air.*

SEC. 240. LIMITATION AND REPORT ON INDIRECT FIRE PROTECTION CAPABILITY INCREMENT 2 CAPABILITY.

(a) **LIMITATION AND REPORT ON INDIRECT FIRE PROTECTION CAPABILITY INCREMENT 2.**—*Not more than 50 percent of the funds authorized to be appropriated by this Act or otherwise made available for fiscal year 2020 for the Army may be obligated or expended for research, development, test, and evaluation for the Indirect Fire Protection Capability Increment 2 capability until the Secretary of the Army submits to the congressional defense committees a report on the Indirect Fire Protection Capability Increment 2 program that contains the following:*

(1) *An assessment of whether the requirements previously established for the enduring program meet the anticipated threat at the time of planned initial operating capability and fully operating capability.*

(2) *A list of candidate systems considered to meet the Indirect Fire Protection Capability Increment 2 enduring requirement, including those fielded or in development by the Army and other elements of the Department of Defense.*

(3) *An assessment of each candidate system's capability against representative threats.*

(4) *An assessment of other relevant specifications of each candidate system, including cost of development, cost per round if applicable, technological maturity, and logistics and sustainment.*

(5) *A plan for how the Army will integrate the chosen system or systems into the Integrated Air and Missile Defense Battle Command System.*

(6) *An assessment of the results of the performance, test, evaluation, integration, and interoperability of batteries one and two of the interim solution.*

(b) **NOTIFICATION REQUIRED.**—*Not later than 10 days after the date on which the President submits the annual budget request of the President for fiscal year 2021 pursuant to section 1105 of title 31, United States Code, the Secretary of the Defense shall, without delegation, submit to the congressional defense committees a notification identifying the military services or agencies that will be responsible for the conduct of air and missile defense in support of joint campaigns as it applies to defense against current and emerging missile threats. The notification shall identify the applicable programs of record to address such threats, including each class of cruise missile threat.*

Subtitle C—Plans, Reports, and Other Matters

SEC. 251. MASTER PLAN FOR IMPLEMENTATION OF AUTHORITIES RELATING TO SCIENCE AND TECHNOLOGY REINVENTION LABORATORIES.

(a) **PLAN REQUIRED.**—*The Secretary of Defense, jointly with the Secretaries of the military departments and in consultation with the Under Secretary of Defense for Research and Engineering, shall develop a master plan for using existing authorities to strengthen and modernize the workforce and capabilities of the science and tech-*

nology reinvention laboratories of the Department of Defense (referred to in this section as the “laboratories”) to enhance the ability of the laboratories to execute missions in the most efficient and effective manner.

(b) *ELEMENTS.*—The master plan required under subsection (a) shall include, with respect to the laboratories, the following:

(1) A summary of hiring and staffing deficiencies at laboratories, by location, and the effect of such deficiencies on the ability of the laboratories—

(A) to meet existing and future requirements of the Department of Defense; and

(B) to recruit and retain qualified personnel.

(2) A summary of existing and emerging military research, development, test, and evaluation mission areas requiring the use of the laboratories.

(3) An explanation of the laboratory staffing capabilities required for each mission area identified under paragraph (2).

(4) Identification of specific projects, including hiring efforts and management reforms, that will be carried out—

(A) to address the deficiencies identified in paragraph (1); and

(B) to support the existing and emerging mission areas identified in paragraph (2).

(5) For each project identified under paragraph (4)—

(A) a summary of the plan for the project;

(B) a description of the resources that will be applied to the project; and

(C) a schedule of required investments that will be made as part of the project.

(6) A description of how the Department, including each military department concerned, will carry out the projects identified in paragraph (4) using existing authorities.

(7) Identification of any statutory, regulatory, or management-related barriers to implementing the master plan and a description of policy and legislative options that may be applied to address such barriers.

(c) *CONSULTATION.*—In developing the master plan required under subsection (a), the Secretary of Defense, the Secretaries of the military departments, and the Under Secretary of Defense for Research and Engineering shall consult with—

(1) the Service Acquisition Executives with responsibilities relevant to the laboratories;

(2) the commander of each military command with responsibilities relating to research and engineering that is affected by the master plan; and

(3) any other officials determined to be relevant by the Secretary of Defense, the Secretaries of the military departments, and the Under Secretary of Defense for Research and Engineering.

(d) *FINAL REPORT.*—Not later than October 30, 2020, the Secretary of Defense, jointly with the Secretaries of the military departments and in consultation with the Under Secretary of Defense for Research and Engineering, shall submit to the congressional defense committees—

(1) the master plan developed under subsection (a);

(2) a report on the activities carried out under this section;
and

(3) a report that identifies any barriers that prevent the full use and implementation of existing authorities, including any barriers presented by the policies, authorities, and activities of—

(A) organizations and elements of the Department of Defense; and

(B) organizations outside the Department.

SEC. 252. INFRASTRUCTURE TO SUPPORT RESEARCH, DEVELOPMENT, TEST, AND EVALUATION MISSIONS.

(a) **MASTER PLAN REQUIRED.**—The Secretary of Defense, acting through the Under Secretary of Defense for Research and Engineering and in coordination with the Secretaries of the military departments, shall develop and implement a master plan that addresses the research, development, test, and evaluation infrastructure and modernization requirements of the Department of Defense, including the science and technology reinvention laboratories and the facilities of the Major Range and Test Facility Base.

(b) **ELEMENTS.**—The master plan required under subsection (a) shall include, with respect to the research, development, test, and evaluation infrastructure of the Department of Defense, the following:

(1) A summary of deficiencies in the infrastructure, by location, and the effect of the deficiencies on the ability of the Department—

(A) to meet current and future military requirements identified in the National Defense Strategy;

(B) to support science and technology development and acquisition programs; and

(C) to recruit and train qualified personnel.

(2) A summary of existing and emerging military research, development, test, and evaluation mission areas, by location, that require modernization investments in the infrastructure—

(A) to improve operations in a manner that may benefit all users;

(B) to enhance the overall capabilities of the research, development, test, and evaluation infrastructure, including facilities and resources;

(C) to improve safety for personnel and facilities; and

(D) to reduce the long-term cost of operation and maintenance.

(3) Identification of specific infrastructure projects that are required to address the infrastructure deficiencies identified under paragraph (1) or to support the existing and emerging mission areas identified under paragraph (2).

(4) For each project identified under paragraph (3)—

(A) a description of the scope of work;

(B) a cost estimate;

(C) a summary of the plan for the project;

(D) an explanation of the level of priority that will be given to the project; and

(E) a schedule of required infrastructure investments.

(5) A description of how the Department, including each military department concerned, will carry out the infrastructure

projects identified in paragraph (3) using the range of authorities and methods available to the Department, including—

(A) military construction authority under section 2802 of title 10, United States Code;

(B) unspecified minor military construction authority under section 2805(a) of such title;

(C) laboratory revitalization authority under section 2805(d) of such title;

(D) the authority to carry out facility repair projects, including the conversion of existing facilities, under section 2811 of such title;

(E) the authority provided under the Defense Laboratory Modernization Pilot Program under section 2803 of the National Defense Authorization Act for Fiscal Year 2016 (Public Law 114–92; 10 U.S.C. 2358 note);

(F) methods that leverage funding from entities outside the Department, including public-private partnerships, enhanced use leases and real property exchanges;

(G) the authority to conduct commercial test and evaluation activities at a Major Range and Test Facility Installation, under section 2681 of title 10, United States Code; and

(H) any other authorities and methods determined to be appropriate by the Secretary of Defense.

(6) Identification of any regulatory or policy barriers to the effective and efficient implementation of the master plan.

(c) CONSULTATION AND COORDINATION.—In developing and implementing the plan required under subsection (a), the Secretary of Defense shall—

(1) consult with existing and anticipated customers and users of the capabilities of the Major Range and Test Facility Base and science and technology reinvention laboratories;

(2) ensure consistency with the science and technology roadmaps and strategies of the Department of Defense and the Armed Forces; and

(3) ensure consistency with the strategic plan for test and evaluation resources required by section 196(d) of title 10, United States Code.

(d) SUBMITTAL TO CONGRESS.—Not later than January 1, 2021, the Secretary of Defense, in coordination with the Secretaries of the military departments, shall submit to the congressional defense committees the master plan developed under subsection (a).

(e) RESEARCH, DEVELOPMENT, TEST, AND EVALUATION INFRASTRUCTURE DEFINED.—In this section, the term “research, development, test, and evaluation infrastructure” means the infrastructure of—

(1) the science and technology reinvention laboratories (as designated under section 1105 of the National Defense Authorization Act for Fiscal Year 2010 (Public Law 111–84; 10 U.S.C. 2358 note));

(2) the Major Range and Test Facility Base (as defined in section 2358a(f)(3) of title 10, United States Code); and

(3) other facilities that support the research development, test, and evaluation activities of the Department.

SEC. 253. ENERGETICS PLAN.

(a) *PLAN REQUIRED.*—The Under Secretary of Defense for Research and Engineering shall, in coordination with the technical directors at defense laboratories and such other officials as the Under Secretary considers appropriate, develop an energetics research and development plan to ensure a long-term multi-domain research, development, prototyping, and experimentation effort that—

(1) maintains United States technological superiority in energetics technology critical to national security;

(2) efficiently develops new energetics technologies and transitions them into operational use, as appropriate; and

(3) maintains a robust industrial base and workforce to support Department of Defense requirements for energetic materials.

(b) *BRIEFING.*—Not later than one year after the date of the enactment of this Act, the Under Secretary shall brief the congressional defense committees on the plan developed under subsection (a).

SEC. 254. STRATEGY AND IMPLEMENTATION PLAN FOR FIFTH GENERATION INFORMATION AND COMMUNICATIONS TECHNOLOGIES.

(a) *IN GENERAL.*—Not later than 270 days after the date of the enactment of this Act, the Secretary of Defense shall develop—

(1) a strategy for harnessing fifth generation (commonly known as “5G”) information and communications technologies to enhance military capabilities, maintain a technological advantage on the battlefield, and accelerate the deployment of new commercial products and services enabled by 5G networks throughout the Department of Defense; and

(2) a plan for implementing the strategy developed under paragraph (1).

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

(1) Adoption and use of secure fourth generation (commonly known as “4G”) communications technologies and the transition to advanced and secure 5G communications technologies for military applications and for military infrastructure.

(2) Science, technology, research, and development efforts to facilitate the advancement and adoption of 5G technology and new uses of 5G systems, subsystems, and components, including—

(A) 5G testbeds for developing military and dual-use applications; and

(B) spectrum-sharing technologies and frameworks.

(3) Strengthening engagement and outreach with industry, academia, international partners, and other departments and agencies of the Federal Government on issues relating to 5G technology and the deployment of such technology, including development of a common industrial base for secure microelectronics.

(4) Defense industrial base supply chain risk, management, and opportunities.

(5) Preserving the ability of the Joint Force to achieve objectives in a contested and congested spectrum environment.

(6) *Strengthening the ability of the Joint Force to conduct full spectrum operations that enhance the military advantages of the United States.*

(7) *Securing the information technology and weapon systems of the Department against malicious activity.*

(8) *Advancing the deployment of secure 5G networks nationwide.*

(9) *Such other matters as the Secretary of Defense determines to be relevant.*

(c) *CONSULTATION.—In developing the strategy and implementation plan required under subsection (a), the Secretary of Defense shall consult with the following:*

(1) *The Chief Information Officer of the Department of Defense.*

(2) *The Under Secretary of Defense for Research and Engineering.*

(3) *The Under Secretary of Defense for Acquisition and Sustainment.*

(4) *The Under Secretary of Defense for Intelligence.*

(5) *Service Acquisition Executives of each military service.*

(d) *PERIODIC BRIEFINGS.—*

(1) *IN GENERAL.—Not later than March 15, 2020, and not less frequently than once every three months thereafter through March 15, 2022, the Secretary of Defense shall provide to the congressional defense committees a briefing on the development and implementation of the strategy required under subsection (a), including an explanation of how the Department of Defense—*

(A) is using secure 5G wireless network technology;

(B) is reshaping the Department's policy for producing and procuring secure microelectronics; and

(C) is working in the interagency and internationally to develop common policies and approaches.

(2) *ELEMENTS.—Each briefing under paragraph (1) shall include information on—*

(A) efforts to ensure a secure supply chain for 5G wireless network equipment and microelectronics;

(B) the continued availability of electromagnetic spectrum for warfighting needs;

(C) planned implementation of 5G wireless network infrastructure in warfighting networks, base infrastructure, defense-related manufacturing, and logistics;

(D) steps taken to work with allied and partner countries to protect critical networks and supply chains; and

(E) such other topics as the Secretary of Defense considers relevant.

SEC. 255. DEPARTMENT-WIDE SOFTWARE SCIENCE AND TECHNOLOGY STRATEGY.

(a) *DESIGNATION OF SENIOR OFFICIAL.—Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense, acting through the Under Secretary of Defense for Research and Engineering and in consultation with the Under Secretary of Defense for Acquisition and Sustainment and appropriate public and private sector organizations, shall designate a single official or existing entity within the Department of Defense as the official or*

entity (as the case may be) with principal responsibility for guiding the development of science and technology activities related to next generation software and software reliant systems for the Department, including—

(1) research and development activities on new technologies for the creation of highly secure, scalable, reliable, time-sensitive, and mission-critical software;

(2) research and development activities on new approaches and tools to software development and deployment, testing, integration, and next generation software management tools to support the rapid insertion of such software into defense systems;

(3) foundational scientific research activities to support advances in software;

(4) technical workforce and infrastructure to support defense science and technology and software needs and mission requirements;

(5) providing capabilities, including technologies, systems, and technical expertise to support improved acquisition of software reliant business and warfighting systems; and

(6) providing capabilities, including technologies, systems, and technical expertise to support defense operational missions which are reliant on software.

(b) *DEVELOPMENT OF STRATEGY.*—The official or entity designated under subsection (a) shall develop a Department-wide strategy for the research and development of next generation software and software reliant systems for the Department of Defense, including strategies for—

(1) types of software-related activities within the science and technology portfolio of the Department;

(2) investment in new approaches to software development and deployment, and next generation management tools;

(3) ongoing research and other support of academic, commercial, and development community efforts to innovate the software development, engineering, and testing process, automated testing, assurance and certification for safety and mission critical systems, large scale deployment, and sustainment;

(4) to the extent practicable, implementing or continuing the implementation of the recommendations set forth in—

(A) the final report of the Defense Innovation Board submitted to the congressional defense committees under section 872 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91; 131 Stat. 1497);

(B) the final report of the Defense Science Board Task Force on the Design and Acquisition of Software for Defense Systems described in section 868 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232; 10 U.S.C. 2223 note); and

(C) other relevant studies on software research, development, and acquisition activities of the Department of Defense.

(5) supporting the acquisition, technology development, testing, assurance, and certification and operational needs of the Department through the development of capabilities, including personnel and research and production infrastructure, and programs in—

(A) the science and technology reinvention laboratories (as designated under section 1105 of the National Defense Authorization Act for Fiscal Year 2010 (Public Law 111–84; 10 U.S.C. 2358 note));

(B) the facilities of the Major Range and Test Facility Base (as defined in section 2358a(f)(3) of title 10, United States Code);

(C) the Defense Advanced Research Projects Agency; and

(D) universities, federally funded research and development centers, and service organizations with activities in software engineering; and

(6) the transition of relevant capabilities and technologies to relevant programs of the Department, including software-reliant cyber-physical systems, tactical systems, enterprise systems, and business systems.

(c) **SUBMITTAL TO CONGRESS.**—Not later than one year after the date of the enactment of this Act, the official or entity designated under subsection (a) shall submit to the congressional defense committees the strategy developed under subsection (b).

SEC. 256. ARTIFICIAL INTELLIGENCE EDUCATION STRATEGY.

(a) **STRATEGY REQUIRED.**—

(1) **IN GENERAL.**—The Secretary of Defense shall develop a strategy for educating servicemembers in relevant occupational fields on matters relating to artificial intelligence.

(2) **ELEMENTS.**—The strategy developed under subsection (a) shall include a curriculum designed to give servicemembers a basic knowledge of artificial intelligence. The curriculum shall include instruction in—

(A) artificial intelligence design;

(B) software coding;

(C) potential military applications for artificial intelligence;

(D) the impact of artificial intelligence on military strategy and doctrine;

(E) artificial intelligence decisionmaking via machine learning and neural networks;

(F) ethical issues relating to artificial intelligence;

(G) the potential biases of artificial intelligence;

(H) potential weakness in artificial intelligence technology;

(I) opportunities and risks; and

(J) any other matters the Secretary of Defense determines to be relevant.

(b) **IMPLEMENTATION PLAN.**—The Secretary of Defense shall develop a plan for implementing the strategy developed under subsection (a).

(c) **SUBMITTAL TO CONGRESS.**—Not later than 270 days after the date of the enactment of this Act, the Secretary of Defense shall submit to the congressional defense committees—

(1) the strategy developed under subsection (a); and

(2) the implementation plan developed under subsection (b).

SEC. 257. CYBER SCIENCE AND TECHNOLOGY ACTIVITIES ROADMAP AND REPORTS.

(a) ROADMAP FOR SCIENCE AND TECHNOLOGY ACTIVITIES TO SUPPORT DEVELOPMENT OF CYBER CAPABILITIES.—

(1) ROADMAP REQUIRED.—The Secretary of Defense, acting through the Under Secretary of Defense for Research and Engineering, shall develop a roadmap for science and technology activities of the Department of Defense to support development of cyber capabilities to meet Department needs and missions.

(2) GOAL OF CONSISTENCY.—The Secretary shall develop the roadmap required by paragraph (1) to ensure consistency with appropriate Federal interagency, industry, and academic activities.

(3) SCOPE.—The roadmap required by paragraph (1) shall—

(A) cover the development of capabilities that will likely see operational use within the next 25 years or earlier; and

(B) address cyber operations and cybersecurity.

(4) CONSULTATION.—The Secretary shall develop the roadmap required by paragraph (1) in consultation with the following:

(A) The Chief Information Officer of the Department.

(B) The secretaries and chiefs of the military departments.

(C) The Director of Operational Test and Evaluation.

(D) The Commander of the United States Cyber Command.

(E) The Director of the National Security Agency.

(F) The Director of the Defense Information Systems Agency.

(G) The Director of the Defense Advanced Research Projects Agency.

(H) The Director of the Defense Digital Service.

(I) Such interagency partners as the Secretary considers appropriate.

(5) FORM.—The Secretary shall develop the roadmap required by paragraph (1) in unclassified form, but may include a classified annex.

(6) PUBLICATION.—The Secretary shall make available to the public the unclassified form of the roadmap developed pursuant to paragraph (1).

(b) ANNUAL REPORT ON CYBER SCIENCE AND TECHNOLOGY ACTIVITIES.—

(1) ANNUAL REPORTS REQUIRED.—In fiscal years 2021, 2022, and 2023, the Under Secretary of Defense for Research and Engineering shall submit to the congressional defense committees a report on the science and technology activities within the Department of Defense relating to cyber matters during the previous fiscal year, the current fiscal year, and the following fiscal year.

(2) CONTENTS.—Each report submitted pursuant to paragraph (1) shall include, for the period covered by the report, a description and listing of the science and technology activities of the Department relating to cyber matters, including the following:

- (A) *Extramural science and technology activities.*
- (B) *Intramural science and technology activities.*
- (C) *Major and minor military construction activities.*
- (D) *Major prototyping and demonstration programs.*
- (E) *A list of agreements and activities to transition capabilities to acquisition activities, including—*
 - (i) *national security systems;*
 - (ii) *business systems; and*
 - (iii) *enterprise and network systems.*
- (F) *Efforts to enhance the national technical cybersecurity workforce, including specific programs to support education, training, internships, and hiring.*
- (G) *Efforts to perform cooperative activities with international partners.*
- (H) *Efforts under the Small Business Innovation Research and the Small Business Technology Transfer Program, including estimated amounts to be expected in the following fiscal year.*
- (I) *Efforts to encourage partnerships between the Department of Defense and universities participating in the National Centers of Academic Excellence in Cyber Operations and Cyber Defense.*

(3) **TIMING.**—Each report submitted pursuant to paragraph (1) shall be submitted concurrently with the annual budget request of the President submitted pursuant to section 1105 of title 31, United States Code.

(4) **FORM.**—The report submitted under paragraph (1) shall be submitted in unclassified form, but may include a classified annex.

SEC. 258. REPORT ON B-52 COMMERCIAL ENGINE REPLACEMENT PROGRAM.

(a) **DOCUMENTATION REQUIRED.**—The Secretary of the Air Force shall submit to the congressional defense committees a report on the B-52 commercial engine replacement program of the Air Force.

(b) **CONTENTS.**—The report submitted under subsection (a) shall include the following:

- (1) *The acquisition strategy of the Secretary for the program.*
- (2) *The cost and schedule estimates of the Secretary for the program.*
- (3) *The key performance parameters or equivalent requirements document for the program.*
- (4) *The test and evaluation strategy of the Secretary for the program.*
- (5) *The logistics strategy of the Secretary for the program.*
- (6) *The post-production fielding strategy of the Secretary for the program.*
- (7) *An assessment of the potential for the commercial engine replacement to achieve nuclear system certification.*

(c) **LIMITATION.**—Of the funds authorized to be appropriated by this Act or otherwise made available for fiscal year 2020 for the Air Force, not more than 75 percent may be obligated or expended until the date on which the Secretary of the Air Force submits to the congressional defense committees the report required by subsection (a).

SEC. 259. COMMERCIAL EDGE COMPUTING TECHNOLOGIES AND BEST PRACTICES FOR DEPARTMENT OF DEFENSE WARFIGHTING SYSTEMS.

(a) *REPORT REQUIRED.*—Not later than 120 days after the date of the enactment of this Act, the Under Secretary of Defense for Acquisition and Sustainment shall submit to the congressional defense committees a report on commercial edge computing technologies and best practices for Department of Defense warfighting systems.

(b) *CONTENTS.*—The report submitted under subsection (a) shall include the following:

(1) Identification of initial warfighting system programs of record that will benefit most from accelerated insertion of commercial edge computing technologies and best practices, resulting in significant near-term improvement in system performance and mission capability.

(2) The plan of the Department of Defense to provide additional funding for the systems identified in paragraph (1) to achieve fielding of accelerated commercial edge computing technologies before or during fiscal year 2021.

(3) The plan of the Department to identify, manage, and provide additional funding for commercial edge computing technologies more broadly over the next four fiscal years where appropriate for—

(A) command, control, communications, and intelligence systems;

(B) logistics systems; and

(C) other mission-critical systems.

(4) A detailed description of the policies, procedures, budgets, and accelerated acquisition and contracting mechanisms of the Department for near-term insertion of commercial edge computing technologies and best practices into military mission-critical systems.

SEC. 260. BIENNIAL REPORT ON THE JOINT ARTIFICIAL INTELLIGENCE CENTER.

(a) *REPORTS REQUIRED.*—Not later than 180 days after the date of the enactment of this Act and biennially thereafter through the end of 2023, the Secretary of Defense shall submit to the congressional defense committees a report on the Joint Artificial Intelligence Center (referred to in this section as the “Center”).

(b) *ELEMENTS.*—Each report under subsection (a) shall include the following:

(1) Information relating to the mission and objectives of the Center.

(2) A description of the National Mission Initiatives, Component Mission Initiatives, and any other initiatives of the Center, including a description of—

(A) the activities carried out under the initiatives;

(B) any investments made or contracts entered into under the initiatives; and

(C) the progress of the initiatives.

(3) A description of how the Center has sought to leverage lessons learned, share best practices, avoid duplication of efforts, and transition artificial intelligence research efforts into operational capabilities by—

(A) collaborating with other organizations and elements of the Department of Defense, including the Defense Agencies and the military departments; and

(B) deconflicting the activities of the Center with the activities of other organizations and elements of the Department.

(4) A description of any collaboration between—

(A) the Center and the private sector, national laboratories, and academia; and

(B) the Center and international allies and partners.

(5) The total number of military, contractor, and civilian personnel who are employed by the Center, assigned to the Center, and performing functions in support of the Center.

(6) A description of the organizational structure and staffing of the Center.

(7) A detailed description of the frameworks, metrics, and capabilities established to measure the effectiveness of the Center and the Center's investments in the National Mission Initiatives and Component Mission Initiatives.

(8) A description of any new policies, standards, or guidance relating to artificial intelligence that have been issued by the Chief Information Officer of the Department.

(9) Identification of any ethical guidelines applicable to the use of artificial intelligence by the Department.

(10) A description of any steps taken by the Center to protect systems that use artificial intelligence from any attempts to misrepresent or alter information used or provided by artificial intelligence.

(c) **JOINT ARTIFICIAL INTELLIGENCE CENTER DEFINED.**—In this section, the term “Joint Artificial Intelligence Center” means the Joint Artificial Intelligence Center of the Department of Defense established pursuant to section 238 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232; 10 U.S.C. 2358 note).

SEC. 261. QUARTERLY UPDATES ON THE OPTIONALLY MANNED FIGHTING VEHICLE PROGRAM.

(a) **IN GENERAL.**—Beginning not later than December 1, 2019, and on a quarterly basis thereafter through October 1, 2022, the Assistant Secretary shall provide to the Committees on Armed Services of the Senate and the House of Representatives a briefing on the progress of the Optionally Manned Fighting Vehicle program of the Army.

(b) **ELEMENTS.**—Each briefing under subsection (a) shall include, with respect to the Optionally Manned Fighting Vehicle program, the following elements:

(1) An overview of funding for the program, including identification of—

(A) any obligations and expenditures that have been made under the program; and

(B) any obligations and expenditures that are planned for the program.

(2) An overview of the program schedule.

(3) An assessment of the status of the program with respect to—

- (A) *the development and approval of technical requirements;*
- (B) *technological maturity;*
- (C) *testing;*
- (D) *delivery; and*
- (E) *program management.*

(4) *Any other matters that the Assistant Secretary considers relevant to a full understanding of the status and plans of the program.*

(c) **ASSISTANT SECRETARY DEFINED.**—*In this section, the term “Assistant Secretary” means the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (or the designee of the Assistant Secretary), in consultation with the Commander of the Army Futures Command (or the designee of the Commander).*

SEC. 262. NATIONAL STUDY ON DEFENSE RESEARCH AT HISTORICALLY BLACK COLLEGES AND UNIVERSITIES AND OTHER MINORITY INSTITUTIONS.

(a) **STUDY REQUIRED.**—*The Secretary of Defense shall seek to enter into an agreement with the National Academies of Sciences, Engineering, and Medicine (referred to in this section as the “National Academies”) under which the National Academies will conduct a study on the status of defense research at covered institutions and the methods and means necessary to advance research capacity at covered institutions to comprehensively address the national security and defense needs of the United States.*

(b) **DESIGNATION.**—*The study conducted under subsection (a) shall be known as the “National Study on Defense Research At Historically Black Colleges and Universities and Other Minority Institutions”.*

(c) **ELEMENTS.**—*The study conducted under subsection (a) shall include an examination of each of the following:*

(1) *The degree to which covered institutions are successful in competing for and executing Department of Defense contracts and grants for defense research.*

(2) *Best practices for advancing the capacity of covered institutions to compete for and conduct research programs related to national security and defense.*

(3) *The advancements and investments necessary to elevate covered institutions to R2 status or R1 status on the Carnegie Classification of Institutions of Higher Education, consistent with the criteria of the classification system.*

(4) *The facilities and infrastructure for defense-related research at covered institutions as compared to the facilities and infrastructure at institutions classified as R1 status on the Carnegie Classification of Institutions of Higher Education.*

(5) *Incentives to attract, recruit, and retain leading research faculty to covered institutions.*

(6) *Best practices of institutions classified as R1 status on the Carnegie Classification of Institutions of Higher Education, including best practices with respect to—*

(A) *the establishment of a distinct legal entity to—*

(i) *enter into contracts or receive grants from the Department;*

(ii) *lay the groundwork for future research opportunities;*

- (iii) develop research proposals;
- (iv) engage with defense research funding organizations; and
- (v) execute the administration of grants; and

(B) determining the type of legal entity, if any, to establish for the purposes described in subparagraph (A).

(7) The ability of covered institutions to develop, protect, and commercialize intellectual property created through defense-related research.

(8) The total amount of defense research funding awarded to all institutions of higher education, including covered institutions, through contracts and grants for each of fiscal years 2010 through 2019 and, with respect to each such institution—

(A) whether the institution established a distinct legal entity to enter into contracts or receive grants from the Department and, if so, the type of legal entity that was established;

(B) the total value of contracts and grants awarded to the institution of higher education for each of fiscal years 2010 through 2019;

(C) the overhead rate of the institution of higher education for fiscal year 2019;

(D) the institution's classification on the Carnegie Classification of Institutions of Higher Education; and

(E) whether the institution qualifies as a covered institution.

(9) Recommendations for strengthening and enhancing the programs executed under section 2362 of title 10, United States Code.

(10) Recommendations to enhance the capacity of covered institutions to transition research products into defense acquisition programs or commercialization.

(11) Previous executive or legislative actions by the Federal Government to address imbalances in Federal research funding, including such programs as the Defense Established Program to Stimulate Competitive Research (commonly known as "DEPSCoR").

(12) The effectiveness of the Department in attracting and retaining students specializing in science, technology, engineering, and mathematics fields from covered institutions for the Department's programs on emerging capabilities and technologies.

(13) Recommendations for the development of incentives to encourage research and educational collaborations between covered institutions and other institutions of higher education.

(14) Any other matters the Secretary of Defense determines to be relevant to advancing the defense research capacity of covered institutions.

(d) REPORTS.—

(1) INITIAL REPORT.—Not later than 180 days after the date of the enactment of this Act, the Secretary of Defense shall submit to the President and the appropriate congressional committees an initial report that includes—

(A) the findings of the study conducted under subsection (a); and

(B) any recommendations that the National Academies may have for action by the executive branch and Congress to improve the participation of covered institutions in Department of Defense research and any actions that may be carried out to expand the research capacity of such institutions.

(2) *FINAL REPORT.*—Not later than December 31, 2021, the Secretary of Defense shall submit to the President and the appropriate congressional committees a comprehensive report on the results of the study required under subsection (a).

(3) *FORM OF REPORTS.*—Each report submitted under this subsection shall be made publicly available.

(e) *IMPLEMENTATION REQUIRED.*—

(1) *IN GENERAL.*—Except as provided in paragraph (2), not later than March 1, 2022, the Secretary of Defense shall commence implementation of each recommendation included in the final report submitted under subsection (d)(2).

(2) *EXCEPTIONS.*—

(A) *DELAYED IMPLEMENTATION.*—The Secretary of Defense may commence implementation of a recommendation described paragraph (1) later than March 1, 2022, if—

(i) the Secretary submits to the congressional defense committees written notice of the intent of the Secretary to delay implementation of the recommendation; and

(ii) includes, as part of such notice, a specific justification for the delay in implementing the recommendation.

(B) *NONIMPLEMENTATION.*—The Secretary of Defense may elect not to implement a recommendation described in paragraph (1), if—

(i) the Secretary submits to the congressional defense committees written notice of the intent of the Secretary not to implement the recommendation; and

(ii) includes, as part of such notice—

(I) the reasons for the Secretary's decision not to implement the recommendation; and

(II) a summary of alternative actions the Secretary will carry out to address the purposes underlying the recommendation.

(3) *IMPLEMENTATION PLAN.*—For each recommendation that the Secretary implements under this subsection, the Secretary shall submit to the congressional defense committees an implementation plan that includes—

(A) a summary of actions that have been, or will be, carried out to implement the recommendation; and

(B) a schedule, with specific milestones, for completing the implementation of the recommendation.

(f) *LIST OF COVERED INSTITUTIONS.*—The Secretary of Defense, in consultation with the Secretary of Education and the Presidents of the National Academies, shall make available a list identifying each covered institution examined as part of the study under subsection (a). The list shall be made available on a publicly accessible website and shall be updated not less frequently than once annually

until the date on which the final report is submitted under subsection (d)(2).

(g) **DEFINITIONS.**—In this section:

(1) The term “appropriate congressional committees” means—

(A) the congressional defense committees;

(B) the Committee on Health, Education, Labor, and Pensions of the Senate; and

(C) the Committee on Education and Labor of the House of Representatives.

(2) The term “covered institution” means—

(A) a part B institution (as that term is defined in section 322(2) of the Higher Education Act of 1965 (20 U.S.C. 1061(2)); or

(B) any other institution of higher education (as that term is defined in section 101 of such Act (20 U.S.C. 1001)) at which not less than 50 percent of the total student enrollment consists of students from ethnic groups that are underrepresented in the fields of science and engineering.

SEC. 263. STUDY ON NATIONAL SECURITY EMERGING BIOTECHNOLOGIES FOR THE DEPARTMENT OF DEFENSE.

(a) **STUDY REQUIRED.**—

(1) **IN GENERAL.**—Not later than 30 days after the date of the enactment of this Act, the Secretary of Defense shall direct the Defense Science Board to carry out a study on emerging biotechnologies pertinent to national security.

(2) **PARTICIPATION.**—Participants in the study shall include the following:

(A) Such members of the Board as the Chairman of the Board considers appropriate for the study.

(B) Such additional temporary members or contracted support as the Secretary—

(i) selects from those recommended by the Chairman for purposes of the study; and

(ii) considers to have significant technical, policy, or military expertise.

(3) **ELEMENTS.**—The study conducted pursuant to paragraph (1) shall include the following:

(A) A review of the military understanding and relevancy of applications of emerging biotechnologies to national security requirements of the Department of Defense, including—

(i) a review of all research and development relating to emerging biotechnologies within the Department of Defense, including areas that demand further priority and investment;

(ii) a review of interagency cooperation and collaboration on research and development relating to emerging biotechnologies between—

(I) the Department;

(II) other departments and agencies in the Federal Government; and

(III) appropriate private sector entities that are involved in research and development relating to emerging biotechnologies;

(iii) an assessment of current biotechnology research in the commercial sector, institutions of higher education, the intelligence community, and civilian agencies of the Federal Government relevant to critical Department of Defense applications of this research;

(iv) an assessment of the potential national security risks of emerging biotechnologies, including risks relating to foreign powers advancing their use of emerging biotechnologies for military applications and other purposes faster than the Department; and

(v) an assessment of the knowledge base of the Department with respect to emerging biotechnologies, including scientific expertise and infrastructure in the Department and the capacity of the Department to integrate emerging biotechnologies into its operational concepts, capabilities, and forces.

(B) An assessment of the technical basis within the Department used to inform the intelligence community of the Department's collection and analysis needs relating to emerging biotechnologies.

(C) Development of a recommendation on a definition of emerging biotechnologies, as appropriate for the Department.

(D) Development of such recommendations as the Board may have for legislative or administrative action relating to national security emerging biotechnologies for the Department.

(4) ACCESS TO INFORMATION.—The Secretary shall provide the Board with timely access to appropriate information, data, resources, and analysis so that the Board may conduct a thorough and independent analysis as required under this section.

(5) REPORT.—(A) Not later than one year after the date on which the Secretary directs the Board to conduct the study pursuant to paragraph (1), the Board shall transmit to the Secretary a final report on the study.

(B) Not later than 30 days after the date on which the Secretary receives the final report under subparagraph (A), the Secretary shall submit to the congressional defense committees such report and such comments as the Secretary considers appropriate.

(b) BRIEFING REQUIRED.—Not later than 90 days after the date of the enactment of this Act, the Secretary of Defense shall provide the congressional defense committees a briefing on potential national security risks of emerging biotechnologies, including risks relating to foreign powers advancing their use of emerging biotechnologies for military applications and other purposes faster than the Department.

SEC. 264. INDEPENDENT STUDY ON OPTIMIZING RESOURCES ALLOCATED TO COMBATING TERRORISM TECHNICAL SUPPORT OFFICE.

(a) INDEPENDENT STUDY.—Not later than 30 days after the date of the enactment of this Act, the Secretary of Defense shall seek to enter into a contract with a federally funded research and development center under which the center will conduct a study on the opti-

mal use of resources allocated to the Combating Terrorism Technical Support Office.

(b) *ELEMENTS OF STUDY.*—In carrying out the study referred to in subsection (a), the federally funded research and development center with which the Secretary enters into a contract under such subsection shall—

(1) evaluate the current mission and organization of the Combating Terrorism Technical Support Office and its relation to the objectives outlined in the National Defense Strategy;

(2) assess the extent to which the activities of the Combating Terrorism Technical Support Office are complementary to and coordinated with other relevant activities by other Department of Defense entities, including activities of the Under Secretary of Defense for Research and Engineering, the Under Secretary of Defense for Acquisition and Sustainment, United States Special Operations Command, and the military departments; and

(3) identify opportunities to improve the efficiency and effectiveness of the Combating Terrorism Technical Support Office, including through increased coordination, realignment, or consolidation with other entities of the Department of Defense, if appropriate.

(c) *SUBMISSION TO DEPARTMENT OF DEFENSE.*—Not later than 180 days after the date of the enactment of this Act, the federally funded research and development center that conducts the study under subsection (a) shall submit to the Secretary of Defense a report on the results of the study in both classified and unclassified form.

(d) *SUBMISSION TO CONGRESS.*—Not later than 30 days after the date on which the Secretary of Defense receives the report under subsection (c), the Secretary shall submit to the congressional defense committees an unaltered copy of the report in both classified and unclassified form, and such comments as the Secretary may have with respect to the report.

SEC. 265. INDEPENDENT ASSESSMENT OF ELECTRONIC WARFARE PLANS AND PROGRAMS.

(a) *ASSESSMENT.*—Not later than 120 days after the date of the enactment of this Act and pursuant to the arrangement entered into under section 222, the Secretary of Defense shall seek to engage the private scientific advisory group known as “JASON” to carry out an independent assessment of electronic warfare plans and programs.

(b) *ELEMENTS.*—In carrying out the assessment under subsection (a), 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 such mission area and operations;

(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 of Defense, 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 of Defense shall appoint appropriate liaisons to JASON to support the timely conduct of the services covered by this section.

(d) **MATERIALS.**—The Secretary of Defense 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 of Defense 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, 2020, the Secretary of Defense shall submit to the congressional defense committees a report on the results of the assessment carried out under subsection (a), including—

(1) the results of the assessment with respect to each element described in subsection (b);

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

(g) **RELATIONSHIP TO OTHER LAW.**—The assessment required under subsection (a) is separate and independent from the assessment described in section 255 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115–232; 132 Stat. 1705) and shall be carried out without regard to any agreement entered into under that section or the results of any assessment conducted pursuant to such agreement.

SEC. 266. TECHNICAL CORRECTION TO GLOBAL RESEARCH WATCH PROGRAM.

Section 2365 of title 10, United States Code, is amended—

(1) in subsections (a) and (d)(2), by striking “Assistant Secretary of Defense for Research and Engineering” both places it appears and inserting “Under Secretary of Defense for Research and Engineering”;

(2) in subsections (d)(3) and (e), by striking “Assistant Secretary” both places it appears and inserting “Under Secretary of Defense for Research and Engineering”; and

(3) in subsection (d), by striking “Assistant Secretary” both places it appears and inserting “Under Secretary”.

TITLE XLII—RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION.

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION (In Thousands of Dollars)

Line	Program Element	Item	FY 2020 Request	House Authorized	Senate Authorized	Conference Change	Conference Authorized
RESEARCH, DEVELOPMENT, TEST & EVAL, ARMY							
BASIC RESEARCH							
002	0601102A	DEFENSE RESEARCH SCIENCES	297,976	297,976	302,976	10,000	307,976
		Counter UAS University Research			[5,000]	[5,000]	
		Cyber basic research				[5,000]	
003	0601103A	UNIVERSITY RESEARCH INITIATIVES	65,858	80,858	65,858	10,000	75,858
		Base infrastructure longevity and resilience		[5,000]			
		Program increase		[10,000]		[10,000]	
004	0601104A	UNIVERSITY AND INDUSTRY RESEARCH CENTERS	86,164	103,164	88,164	9,000	95,164
		3D printing			[2,000]		
		Program increase		[12,000]			
		Program increase—artificial intelligence				[5,000]	
		Program increase—military medical innovation		[5,000]			
		University and industry biotechnology research				[4,000]	
005	0601121A	CYBER COLLABORATIVE RESEARCH ALLIANCE	4,982	4,982	9,982		4,982
		Cyber basic research			[5,000]		
		SUBTOTAL BASIC RESEARCH	454,980	486,980	466,980	29,000	483,980
APPLIED RESEARCH							

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2020 Request	House Authorized	Senate Authorized	Conference Change	Conference Authorized
010	0602141A	LETHALITY TECHNOLOGY	26,961	26,961	26,961	5,000	31,961
		Program increase—next generation air-breathing propulsion technology.				[5,000]	
011	0602142A	ARMY APPLIED RESEARCH	25,319	25,319	25,319		25,319
012	0602143A	SOLDIER LETHALITY TECHNOLOGY	115,274	125,274	118,274	13,000	128,274
		Expeditionary mobile base camp technology		[5,000]		[5,000]	
		HEROES program		[5,000]		[5,000]	
		UPL MDTF for INDOPACOM			[3,000]	[3,000]	
013	0602144A	GROUND TECHNOLOGY	35,199	45,199	41,699	19,000	54,199
		Advanced materials manufacturing process			[2,000]	[2,000]	
		Biopolymer structural materials			[2,000]	[2,000]	
		Cellulose structural materials			[2,500]	[5,000]	
		High performance polymers research		[5,000]		[5,000]	
		Manufacturing research technology		[5,000]		[5,000]	
014	0602145A	NEXT GENERATION COMBAT VEHICLE TECHNOLOGY	219,047	225,047	234,047	6,000	225,047
		Structural thermoplastics		[6,000]		[6,000]	
		Support operational energy development and testing			[15,000]		
015	0602146A	NETWORK C3I TECHNOLOGY	114,516	120,016	114,516	2,500	117,016
		Assured PNT lab		[3,000]			
		Next generation SAR small sat		[2,500]		[2,500]	
016	0602147A	LONG RANGE PRECISION FIRES TECHNOLOGY	74,327	79,327	86,327	12,000	86,327
		Composite tube and propulsion technology			[10,000]	[10,000]	
		NextGen propulsion cycle artillery range extension		[5,000]			
		Novel printed armament components		96,601	[2,000]	[2,000]	
017	0602148A	FUTURE VEHICLE LIFT TECHNOLOGY	93,601	96,601	93,601	3,000	96,601
		Program increase		[3,000]		[3,000]	
018	0602150A	AIR AND MISSILE DEFENSE TECHNOLOGY	50,771	50,771	50,771		50,771

020	0602213A	C3I APPLIED CYBER	18,947	23,947	18,947	18,947
		Cyber research		[5,000]		
023	0602307A	ADVANCED WEAPONS TECHNOLOGY	5,000		5,000	
		Directed energy test range workloads	[5,000]		[5,000]	
037	0602784A	MILITARY ENGINEERING TECHNOLOGY	5,000		5,000	
		Cellulose nanocomposites research	[5,000]		[5,000]	
038	0602785A	MANPOWER/PERSONNEL/TRAINING TECHNOLOGY	20,873	20,873	20,873	20,873
040	0602787A	MEDICAL TECHNOLOGY	99,155	102,155	106,955	108,955
		Female warfighter performance research		[3,000]	9,800	
		Musculoskeletal injury prevention research	[4,800]		[2,000]	
		Musculoskeletal injury risk mitigation	[3,000]		[4,800]	
		Program increase	[3,000]		[3,000]	
		SUBTOTAL APPLIED RESEARCH	893,990	938,490	70,300	964,290
ADVANCED TECHNOLOGY DEVELOPMENT						
041	0603001A	WARFIGHTER ADVANCED TECHNOLOGY	5,000			
		Expeditionary maneuver support technologies	[5,000]			
042	0603002A	MEDICAL ADVANCED TECHNOLOGY	42,030	42,030		42,030
047	0603007A	MANPOWER, PERSONNEL AND TRAINING ADVANCED TECHNOLOGY	11,038	11,038		11,038
050	0603117A	ARMY ADVANCED TECHNOLOGY DEVELOPMENT	63,338	63,338		63,338
051	0603118A	SOLDIER LETHALITY ADVANCED TECHNOLOGY	118,468	118,468		128,468
		Improvement of combat helmet suspension systems	[5,000]		10,000	
		Thermal mitigation technologies	[5,000]		[5,000]	
052	0603119A	GROUND ADVANCED TECHNOLOGY	12,593	32,593	23,000	35,593
		100 hour battery		[10,000]	[10,000]	
		Computational manufacturing engineering	[5,000]		[5,000]	
		Ground advanced technology for cold regions		[3,000]	[3,000]	
		Lightweight protective and hardening materials		[5,000]	[5,000]	
		Robotic construction research		13,769		13,769
059	0603457A	C3I CYBER ADVANCED DEVELOPMENT	13,769	13,769		13,769
060	0603461A	HIGH PERFORMANCE COMPUTING MODERNIZATION PROGRAM	184,755	184,755	40,000	224,755
		Program increase	[40,000]		[40,000]	

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2020 Request	House Authorized	Senate Authorized	Conference Change	Conference Authorized
061	0603462A	NEXT GENERATION COMBAT VEHICLE ADVANCED TECHNOLOGY	160,035	170,035	185,035	14,000	174,035
		Ground vehicle sustainment research		[5,000]	[5,000]	[4,000]	
		Hydrogen fuel cell propulsion & autonomous driving controls		[20,000]	[20,000]		
		Program increase—hydrogen fuel cells		[10,000]	[10,000]		
062	0603463A	NETWORK C3I ADVANCED TECHNOLOGY	106,899	103,899	106,899	-3,000	103,899
		Underexecution		[-3,000]		[-3,000]	
063	0603464A	LONG RANGE PRECISION FIRES ADVANCED TECHNOLOGY	174,386	179,386	178,386	9,000	183,386
		Hypersonics research		[4,000]	[4,000]		
		Program increase missile demonstrations		[5,000]		[5,000]	
064	0603465A	FUTURE VERTICAL LIFT ADVANCED TECHNOLOGY	151,640	146,640	151,640		151,640
		Excess to need		[-5,000]			
065	0603466A	AIR AND MISSILE DEFENSE ADVANCED TECHNOLOGY	60,613	60,613	60,613		60,613
		SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT	1,099,564	1,166,564	1,148,564	93,000	1,192,564
ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES							
073	0603305A	ARMY MISSILE DEFENSE SYSTEMS INTEGRATION	10,987	30,987	10,987	8,000	18,987
		Conventional mission capabilities		[10,000]		[8,000]	
		System lab integration improvements		[10,000]			
074	0603327A	AIR AND MISSILE DEFENSE SYSTEMS ENGINEERING	15,148	15,148	15,148		15,148
075	0603619A	LANDMINE WARFARE AND BARRIER—ADV DEV	92,915	92,915	92,915		92,915
077	0603639A	TANK AND MEDIUM CALIBER AMMUNITION	82,146	82,146	82,146		82,146
078	0603645A	ARMORED SYSTEM MODERNIZATION—ADV DEV	157,656	157,656	157,656		157,656
079	0603747A	SOLDIER SUPPORT AND SURVIVABILITY	6,514	6,514	6,514		6,514
080	0603766A	TACTICAL ELECTRONIC SURVEILLANCE SYSTEM—ADV DEV	34,890	37,890	34,890		34,890
		Mobile ground terminal		[3,000]			
081	0603774A	NIGHT VISION SYSTEMS ADVANCED DEVELOPMENT	251,011	206,011	251,011	-28,220	222,791
		IVAS insufficient justification		[-45,000]		[-28,220]	

082	0603779A	ENVIRONMENTAL QUALITY TECHNOLOGY—DEM/VAL	15,132	15,132	15,132	15,132	15,132
083	0603790A	NATO RESEARCH AND DEVELOPMENT	5,406	5,406	5,406	5,406	5,406
084	0603801A	AVIATION—ADV DEV	459,290	443,340	534,890	75,600	534,890
		Early to need		[-15,950]			
		Program increase: Future long-range assault aircraft				[75,600]	
		UPL FVL CS3 program increase					
085	0603804A	LOGISTICS AND ENGINEER EQUIPMENT—ADV DEV	6,254	6,254	6,254	6,254	6,254
086	0603807A	MEDICAL SYSTEMS—ADV DEV	31,175	31,175	31,175	31,175	31,175
087	0603827A	SOLDIER SYSTEMS—ADVANCED DEVELOPMENT	22,113	22,113	22,113	22,113	22,113
088	0604017A	ROBOTICS DEVELOPMENT	115,222	115,222	115,222	-27,000	88,222
		Early to need				[-27,000]	
090	0604021A	ELECTRONIC WARFARE TECHNOLOGY MATURATION (MIP)	18,043	18,043	18,043	18,043	18,043
091	0604100A	ANALYSIS OF ALTERNATIVES	10,023	10,023	10,023	10,023	10,023
092	0604113A	FUTURE TACTICAL UNMANNED AIRCRAFT SYSTEM (FUAS)	40,745	40,745	40,745	-5,000	35,745
		Program adjustment				[-5,000]	
093	0604114A	LOWER TIER AIR MISSILE DEFENSE (LTAMD) SENSOR	427,772	427,772	427,772	427,772	379,772
		Rapid prototyping excess funding				[-48,000]	
094	0604115A	TECHNOLOGY MATURATION INITIATIVES	196,676	161,676	196,676	-35,000	161,676
		Insufficient schedule detail				[-35,000]	
095	0604117A	MANEUVER—SHORT RANGE AIR DEFENSE (M-SHORAD)	33,100	29,100	33,100	-3,700	29,400
		Excess testing cost				[-3,700]	
097	0604119A	ARMY ADVANCED COMPONENT DEVELOPMENT & PROTOTYPING	115,116	105,116	115,116	-11,785	103,331
		Early to need				[-11,785]	
099	0604121A	SYNTHETIC TRAINING ENVIRONMENT REFINEMENT & PROTOTYPING	136,761	111,761	136,761	-25,000	111,761
		Early to need (IVAS)				[-25,000]	
100	0604182A	HYPERSONICS	228,000	259,000	358,610	161,610	389,610
		Transfer from RDT&E Defense-Wide, line 124				[31,000]	
		UPL accelerate Hypersonic Weapons System				[130,610]	
102	0604403A	FUTURE INTERCEPTOR	8,000	8,000	8,000	-8,000	
		Early to need				[-8,000]	
103	0604541A	UNIFIED NETWORK TRANSPORT	39,600	30,600	39,600	-9,900	29,700
		Early to need				[-9,900]	

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104	0604644A	MOBILE MEDIUM RANGE MISSILE	20,000		20,000	-10,000	10,000
		Program decrease		[-20,000]		[-10,000]	
106	0305251A	CYBERSPACE OPERATIONS FORCES AND FORCE SUPPORT	52,102	52,102	52,102		52,102
107	1206120A	ASSURED POSITIONING, NAVIGATION AND TIMING (PNT)	192,562	150,062	192,562	-42,500	150,062
		Project cancellation		[-42,500]		[-42,500]	
108	1206308A	ARMY SPACE SYSTEMS INTEGRATION	104,996	54,996	104,996		104,996
		Program delay		[-50,000]			
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES	2,929,355	2,726,905	3,135,565	-8,895	2,920,460
SYSTEM DEVELOPMENT & DEMONSTRATION							
109	0604201A	AIRCRAFT AVIONICS	29,164	29,164	29,164		29,164
110	0604270A	ELECTRONIC WARFARE DEVELOPMENT	70,539	70,539	70,539		70,539
113	0604601A	INFANTRY SUPPORT WEAPONS	106,121	125,321	126,021		106,121
		Army unfunded priority—NGSW program increase		[19,200]			
		UPL Next Generation Squad Weapon—Automatic Rifle			[19,900]		
114	0604604A	MEDIUM TACTICAL VEHICLES	2,152	2,152	2,152		2,152
115	0604611A	JAVELIN	17,897	16,397	17,897	-1,842	16,055
		Qualification testing early to need		[-1,500]		[-1,842]	
116	0604622A	FAMILY OF HEAVY TACTICAL VEHICLES	16,745	16,745	16,745		16,745
117	0604633A	AIR TRAFFIC CONTROL	6,989	6,989	6,989		6,989
118	0604642A	LIGHT TACTICAL WHEELED VEHICLES	10,465	10,465	10,465		2,965
		Program reduction				[-7,500]	
119	0604645A	ARMORED SYSTEMS MODERNIZATION (ASM)—ENG DEV	310,152	295,152	310,152	-16,188	293,964
		Program delay		[-15,000]		[-16,188]	
120	0604710A	NIGHT VISION SYSTEMS—ENG DEV	181,732	166,732	181,732	-15,000	166,732
		Insufficient justification (IVAS)		[-15,000]		[-15,000]	
121	0604713A	COMBAT FEEDING, CLOTHING, AND EQUIPMENT	2,393	2,393	2,393		2,393

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143	0605018A	Program decrease INTEGRATED PERSONNEL AND PAY SYSTEM-ARMY (PPS-A)	142,773	94,773	[-142,773]	[-45,000]	92,073
		Poor business process reengineering				[-50,700]	
		Program decrease		[-48,000]		[-50,700]	
144	0605028A	ARMORED MULTI-PURPOSE VEHICLE (AMPV)	96,730	96,730	96,730	-4,600	92,130
		Program reduction				[-4,600]	
145	0605029A	INTEGRATED GROUND SECURITY SURVEILLANCE RESPONSE CAPABILITY (IGSSR-C)	6,699	6,699	6,699		6,699
146	0605030A	JOINT TACTICAL NETWORK CENTER (JTNC)	15,882	15,882	15,882		15,882
147	0605031A	JOINT TACTICAL NETWORK (JTN)	40,808	40,808	40,808		40,808
149	0605033A	GROUND-BASED OPERATIONAL SURVEILLANCE SYSTEM—EXPEDITIONARY (GBOSS-E)	3,847	3,847	3,847		3,847
150	0605034A	TACTICAL SECURITY SYSTEM (TSS)	6,928	6,928	6,928		6,928
151	0605035A	COMMON INFRARED COUNTERMEASURES (CIRCM)	34,488	34,488	34,488		34,488
152	0605036A	COMBATING WEAPONS OF MASS DESTRUCTION (CWMD)	10,000	10,000	10,000		10,000
154	0605038A	NUCLEAR BIOLOGICAL CHEMICAL RECONNAISSANCE VEHICLE (NBCRV) SENSOR SUITE	6,054	6,054	6,054		6,054
155	0605041A	DEFENSIVE CYBER TOOL DEVELOPMENT	62,262	62,262	62,262	-16,600	45,662
		Contract delays				[-10,000]	
		Excess growth				[-6,600]	
156	0605042A	TACTICAL NETWORK RADIO SYSTEMS (LOW-TIER)	35,654	28,654	35,654	-6,400	29,254
		Excess growth		[-7,000]		[-6,400]	
157	0605047A	CONTRACT WRITING SYSTEM	19,682	19,682	[-19,682]		19,682
		Program duplication					
158	0605049A	MISSILE WARNING SYSTEM MODERNIZATION (MWSM)	1,539	1,539	1,539		1,539
159	0605051A	AIRCRAFT SURVIVABILITY DEVELOPMENT	64,557	64,557	64,557		64,557
160	0605052A	INDIRECT FIRE PROTECTION CAPABILITY INC 2—BLOCK 1	243,228	243,228	149,628	-6,800	236,428

161	0605053A	EMAM development ahead of need Iron Dome testing and delivery UPL Multi-Domain Artillery GROUND ROBOTICS Army requested realignment Excess to requirement Testing and evaluation excess growth Unjustified request	41,308 28,508 28,508 41,308 41,896 45,896	[-124,200] [20,600] [10,000] [-12,800]	[-6,800]	28,508
162	0605054A	EMERGING TECHNOLOGY INITIATIVES Testing and evaluation excess growth	41,896 [-4,000]	45,896	[-12,800] [-14,280] [-4,280] [-10,000]	31,616
163	0605203A	ARMY SYSTEM DEVELOPMENT & DEMONSTRATION	164,883	164,883		164,883
165	0605450A	JOINT AIR-TO-GROUND MISSILE (JAGM)	9,500	9,500		9,500
166	0605457A	ARMY INTEGRATED AIR AND MISSILE DEFENSE (AIAMD) Testing and evaluation excess growth	208,938 [-5,000]	208,938 378,400		193,938
167	0605625A	MANNED GROUND VEHICLE Program decrease	378,400	418,400	[-15,000] [-150,000]	228,400
168	0605766A	UPL NGCV 50mm gun NATIONAL CAPABILITIES INTEGRATION (MIP)	7,835	[40,000] 7,835		7,835
169	0605812A	Mobile ground terminal JOINT LIGHT TACTICAL VEHICLE (JLTV) ENGINEERING AND MANUFACTURING DEVELOPMENT PH. Army requested realignment	7,232	7,232	4,500	7,232
170	0605830A	AVIATION GROUND SUPPORT EQUIPMENT	1,664	[4,500]		1,664
172	0303032A	TROJAN—RH12	3,936	1,664 3,936	[4,500]	3,936
174	0304270A	ELECTRONIC WARFARE DEVELOPMENT SUBTOTAL SYSTEM DEVELOPMENT & DEMONSTRATION	19,675 3,549,431	19,675 3,344,976		19,675 3,189,390
176	0604256A	ROT&E MANAGEMENT SUPPORT THREAT SIMULATOR DEVELOPMENT	14,117	16,117	2,000	16,117
177	0604258A	Cybersecurity threat simulation	8,327	[2,000]		8,327
178	0604759A	TARGET SYSTEMS DEVELOPMENT MAJOR T&E INVESTMENT	136,565	136,565		136,565

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179	0605103A	RAND ARROYO CENTER	13,113	13,113	13,113		13,113
180	0605301A	ARMY KWALEIN ATOLL	238,691	226,691	238,691		238,691
		Program decrease		[-12,000]			
181	0605326A	CONCEPTS EXPERIMENTATION PROGRAM	42,922	42,922	42,922	-6,000	36,922
		Program reduction				[-6,000]	
183	0605601A	ARMY TEST RANGES AND FACILITIES	334,468	334,468	349,468		334,468
		Directed energy test capabilities			[15,000]		
184	0605602A	ARMY TECHNICAL TEST INSTRUMENTATION AND TARGETS	46,974	51,974	46,974	5,000	51,974
		Program increase—space and missile cybersecurity		[5,000]		[5,000]	
185	0605604A	SURVIVABILITY/LETHALITY ANALYSIS	35,075	35,075	35,075		35,075
186	0605606A	AIRCRAFT CERTIFICATION	3,461	3,461	3,461		3,461
187	0605702A	METEOROLOGICAL SUPPORT TO RDT&E ACTIVITIES	6,233	6,233	6,233		6,233
188	0605706A	MATERIEL SYSTEMS ANALYSIS	21,342	21,342	21,342		21,342
189	0605709A	EXPLOITATION OF FOREIGN ITEMS	11,168	11,168	11,168		11,168
190	0605712A	SUPPORT OF OPERATIONAL TESTING	52,723	52,723	52,723		52,723
191	0605716A	ARMY EVALUATION CENTER	60,815	60,815	60,815		60,815
192	0605718A	ARMY MODELING & SIM X-OMD COLLABORATION & INTEG.	2,527	2,527	2,527		2,527
193	0605801A	PROGRAMWIDE ACTIVITIES	58,175	61,175	58,175		58,175
		Program increase for transition costs		[3,000]			
194	0605803A	TECHNICAL INFORMATION ACTIVITIES	25,060	25,060	25,060		25,060
195	0605805A	MUNITIONS STANDARDIZATION, EFFECTIVENESS AND SAFETY	44,458	49,458	44,458		44,458
		Advanced lightweight small arms and medium caliber ammunition.		[5,000]			
196	0605857A	ENVIRONMENTAL QUALITY TECHNOLOGY MGMT SUPPORT	4,681	4,681	4,681		4,681
197	0605898A	ARMY DIRECT REPORT HEADQUARTERS—R&D - MHA	53,820	53,820	53,820		53,820
198	0606001A	MILITARY GROUND-BASED CREW TECHNOLOGY	4,291	4,291	4,291		4,291
199	0606002A	RONALD REAGAN BALLISTIC MISSILE DEFENSE TEST SITE	62,069	62,069	62,069		62,069

200	0606003A	COUNTERINTEL AND HUMAN INTEL MODERNIZATION	1,050	1,050	1,050	1,050	
201	0606942A	ASSESSMENTS AND EVALUATIONS CYBER VULNERABILITIES	4,500	4,500	4,500	4,500	
		SUBTOTAL RDT&E MANAGEMENT SUPPORT	1,286,625	1,287,625	1,303,625	1,287,625	1,000
OPERATIONAL SYSTEMS DEVELOPMENT							
UNDISTRIBUTED							
204	0603778A	MLRS PRODUCT IMPROVEMENT PROGRAM	22,877	17,877	22,877	19,877	-3,000
		HIMARS excess growth		[-5,000]			[-3,000]
206	0605024A	ANTI-TAMPER TECHNOLOGY SUPPORT	8,491	8,491	8,491	8,491	
207	0607131A	WEAPONS AND MUNITIONS PRODUCT IMPROVEMENT PROGRAMS	15,645	15,645	15,645	15,645	
209	0607134A	LONG RANGE PRECISION FIRES (LRPF)	164,182	164,182	164,182	164,182	
211	0607136A	BLACKHAWK PRODUCT IMPROVEMENT PROGRAM	13,039	13,039	13,039	13,039	
212	0607137A	CHINOOK PRODUCT IMPROVEMENT PROGRAM	174,371	174,371	174,371	168,371	-6,000
		Program reduction					[-6,000]
213	0607138A	FIXED WING PRODUCT IMPROVEMENT PROGRAM	4,545	4,545	4,545	4,545	
		Program reduction					[-4,545]
214	0607139A	IMPROVED TURBINE ENGINE PROGRAM	206,434	206,434	206,434	206,434	
216	0607142A	AVIATION ROCKET SYSTEM PRODUCT IMPROVEMENT AND DEVELOPMENT	24,221	14,221	24,221	21,130	-3,091
		Integrated munitions launcher early to need		[-10,000]			[-3,091]
217	0607143A	UNMANNED AIRCRAFT SYSTEM UNIVERSAL PRODUCTS	32,016	32,016	32,016	25,516	-6,500
		Program reduction					[-6,500]
218	0607145A	APACHE FUTURE DEVELOPMENT	5,448	448	5,448	448	-5,000
		Unjustified request		[-5,000]			[-5,000]
219	0607312A	ARMY OPERATIONAL SYSTEMS DEVELOPMENT	49,526	49,526	49,526	49,526	
220	0607665A	FAMILY OF BIOMETRICS	1,702	1,702	1,702	1,702	
221	0607865A	PATRIOT PRODUCT IMPROVEMENT	96,430	96,430	96,430	63,630	-32,800
		Excess growth					[-32,800]
222	0203728A	JOINT AUTOMATED DEEP OPERATION COORDINATION SYSTEM (JADOGCS)	47,398	47,398	47,398	47,398	
223	0203735A	COMBAT VEHICLE IMPROVEMENT PROGRAMS	334,463	324,463	334,463	290,545	-43,918
		Early to need		[-10,000]			[-41,918]
		Program support excess growth					[-2,000]
225	0203743A	155MM SELF-PROPELLED HOWITZER IMPROVEMENTS	214,246	214,246	214,246	192,746	-21,500

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226	0203744A	Program reduction AIRCRAFT MODIFICATIONS/PRODUCT IMPROVEMENT PROGRAMS	16,486	11,986	16,486	[-21,500]	13,778
		Excess to need		[-4,500]		[-2,708]	
227	0203752A	AIRCRAFT ENGINE COMPONENT IMPROVEMENT PROGRAM	144	144	144		144
228	0203758A	DIGITIZATION	5,270	5,270	5,270		5,270
229	0203801A	MISSILE/AIR DEFENSE PRODUCT IMPROVEMENT PROGRAM	1,287	1,287	1,287		1,287
230	0203802A	OTHER MISSILE PRODUCT IMPROVEMENT PROGRAMS		24,100	24,100		
		UPL CD ATACMS		[24,100]			
234	0205412A	ENVIRONMENTAL QUALITY TECHNOLOGY—OPERATIONAL SYSTEM DEV	732	732	732		732
235	0205456A	LOWER TIER AIR AND MISSILE DEFENSE (AMD) SYSTEM	107,746	107,746	107,746	-8,000	99,746
		Testing excess to need				[-8,000]	
236	0205778A	GUIDED MULTIPLE-LAUNCH ROCKET SYSTEM (GMLRS)	138,594	128,594	138,594	[-10,000]	128,594
		Testing excess to need		[-10,000]			
238	0303028A	SECURITY AND INTELLIGENCE ACTIVITIES	13,845	13,845	13,845		13,845
239	0303140A	INFORMATION SYSTEMS SECURITY PROGRAM	29,185	29,185	29,185		29,185
240	0303141A	GLOBAL COMBAT SUPPORT SYSTEM	68,976	58,976	68,976	-20,600	48,376
		Program decrease		[-10,000]		[-20,600]	
241	0303150A	WMWCCS/GLOBAL COMMAND AND CONTROL SYSTEM	2,073	2,073	2,073		2,073
245	0305179A	INTEGRATED BROADCAST SERVICE (IBS)	459	459	459		459
246	0305204A	TACTICAL UNMANNED AERIAL VEHICLES	5,097	5,097	5,097		5,097
247	0305206A	AIRBORNE RECONNAISSANCE SYSTEMS	11,177	11,177	11,177		11,177
248	0305208A	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	38,121	38,121	38,121		38,121
250	0305232A	RQ-11 UAV	3,218	3,218	3,218		3,218
251	0305233A	RQ-7 UAV	7,817	7,817	7,817		7,817
252	0307665A	BIOMETRICS ENABLED INTELLIGENCE	2,000	2,000	2,000		2,000
253	0708045A	END ITEM INDUSTRIAL PREPAREDNESS ACTIVITIES	59,848	64,848	62,848	8,000	67,848
		Nanoscale materials manufacturing			[3,000]	[3,000]	

254	1203142A	Program increase—additive manufacturing technology insertion ...							
		SATCOM GROUND ENVIRONMENT (SPACE)	34,169	34,169	[5,000]	34,169	34,169		34,169
255	1208053A	JOINT TACTICAL GROUND SYSTEM	10,275	10,275		10,275	10,275		10,275
255A	99999999999	CLASSIFIED PROGRAMS	7,273	7,273		7,273	7,273		7,273
		SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT	1,978,826	1,929,326	-159,662	2,005,926	1,819,164		1,819,164
		SUBTOTAL UNDISTRIBUTED		-49,500		27,100	-159,662		-159,662
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, ARMY	12,192,771	12,030,821	-335,298	12,344,126	11,857,473		11,857,473
		RESEARCH, DEVELOPMENT, TEST & EVAL, NAVY							
		BASIC RESEARCH							
001	0601103N	UNIVERSITY RESEARCH INITIATIVES	116,850	136,850	30,000	131,850	146,850		146,850
		Advanced radar research		[5,000]		[10,000]	[10,000]		[10,000]
		Cyber basic research		[5,000]		[5,000]	[5,000]		[5,000]
		Defense University research initiatives				[5,000]	[5,000]		[5,000]
		Digital radar research				[10,000]	[10,000]		[10,000]
		Program increase							
002	0601152N	IN-HOUSE LABORATORY INDEPENDENT RESEARCH	19,121	19,121		19,121	19,121		19,121
003	0601153N	DEFENSE RESEARCH SCIENCES	470,007	470,007		470,007	470,007		470,007
		SUBTOTAL BASIC RESEARCH	605,978	625,978	30,000	620,978	635,978		635,978
		APPLIED RESEARCH							
004	0602114N	POWER PROJECTION APPLIED RESEARCH	18,546	25,546	7,000	18,546	25,546		25,546
		Hypersonic testing facilities		[7,000]					[7,000]
005	0602123N	FORCE PROTECTION APPLIED RESEARCH	119,517	162,517	46,500	136,017	166,017		166,017
		Autonomous vehicle collaboration across maritime domains				[8,000]	[8,000]		[8,000]
		Carbon capture				[8,000]	[8,000]		[8,000]
		Cyber-physical research				[2,500]	[2,500]		[2,500]
		Electric propulsion research				[5,000]	[5,000]		[5,000]
		Energy resilience				[3,000]	[3,000]		[3,000]
		Energy resilience research				[5,000]	[5,000]		[5,000]
		Hybrid composite struct. res. enhanced mobility				[5,000]	[5,000]		[5,000]

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		Navy power and energy systems technology		[5,000]		[5,000]	
		Program increase		[10,000]		[10,000]	
		Program reduction			[-5,000]		
		Test bed for autonomous ship systems			[8,000]		
006	0602131M	MARINE CORPS LANDING FORCE TECHNOLOGY	56,604	61,604	59,604	5,000	61,604
		Interdisciplinary cybersecurity			[3,000]		
		Interdisciplinary expeditionary cybersecurity research				[5,000]	
007	0602235N	COMMON PICTURE APPLIED RESEARCH	49,297	49,297	44,297	-5,000	44,297
		Coordinate space activities			[-5,000]		
008	0602236N	WARFIGHTER SUSTAINMENT APPLIED RESEARCH	63,825	68,825	65,825	[-5,000]	63,825
		Warfighter safety and performance		[5,000]			
		Warfighter safety and performance research					
009	0602271N	ELECTROMAGNETIC SYSTEMS APPLIED RESEARCH	83,497	83,497	78,497	[-5,000]	83,497
		Coordinate EW activities					
010	0602435N	OCEAN WARFIGHTING ENVIRONMENT APPLIED RESEARCH	63,894	63,894	63,894		63,894
011	0602651M	JOINT NON-LETHAL WEAPONS APPLIED RESEARCH	6,346	6,346	6,346		6,346
012	0602747N	UNDERSEA WARFARE APPLIED RESEARCH	57,075	77,075	64,575	17,000	74,075
		Academic partnerships for undersea vehicle research		[10,000]	[7,500]	[10,000]	
		Resident autonomous undersea robotics		[10,000]		[7,000]	
013	0602750N	FUTURE NAVAL CAPABILITIES APPLIED RESEARCH	154,755	154,755	154,755		154,755
014	0602782N	MINE AND EXPEDITIONARY WARFARE APPLIED RESEARCH	36,074	36,074	36,074		36,074
015	0602792N	INNOVATIVE NAVAL PROTOTYPES (INP) APPLIED RESEARCH	153,062	153,062	153,062		153,062
016	0602861N	SCIENCE AND TECHNOLOGY MANAGEMENT—ONR FIELD ACTIVITIES	73,961	73,961	73,961		73,961
		SUBTOTAL APPLIED RESEARCH	936,453	1,016,453	955,453	70,500	1,006,953
		ADVANCED TECHNOLOGY DEVELOPMENT					
017	0603123N	FORCE PROTECTION ADVANCED TECHNOLOGY	35,286	35,286	35,286		35,286

018	0603271N	ELECTROMAGNETIC SYSTEMS ADVANCED TECHNOLOGY	9,499	9,499	9,499	9,499	
019	0603640M	USMC ADVANCED TECHNOLOGY DEMONSTRATION (ATD)	177,847	177,847	176,847	177,847	
		Consolidate efforts in AI/ML with Joint Force		[5,000]	[-5,000]		
		Program increase—modular advanced armed robotic system					
		UPL MUDLAN program increase		[9,000]			
020	0603651M	JOINT NON-LETHAL WEAPONS TECHNOLOGY DEVELOPMENT	13,307	13,307	13,307	13,307	
021	0603673N	FUTURE NAVAL CAPABILITIES ADVANCED TECHNOLOGY DEVELOPMENT	231,907	231,907	231,907	231,907	
022	0603680N	MANUFACTURING TECHNOLOGY PROGRAM	60,138	80,138	60,138	65,138	
		Program increase		[20,000]			
023	0603729N	WARFIGHTER PROTECTION ADVANCED TECHNOLOGY	4,849	4,849	4,849	4,849	
025	0603758N	NAVY WARFIGHTING EXPERIMENTS AND DEMONSTRATIONS	67,739	67,739	67,739	67,739	
026	0603782N	MINE AND EXPEDITIONARY WARFARE ADVANCED TECHNOLOGY	13,335	13,335	13,335	13,335	
027	0603801N	INNOVATIVE NAVAL PROTOTYPES (INP) ADVANCED TECHNOLOGY DEVELOPMENT	133,303	176,303	128,303	150,330	
		Electromagnetic railgun		[20,350]			
		Funds excess to requirements					[10,000]
		Program increase		[22,650]			[-7,973]
		Reduce electronic maneuver					[15,000]
		SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT	742,210	810,210	741,210	769,237	27,027
		ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES					
028	0603207N	AIR/OCEAN TACTICAL APPLICATIONS	32,643	32,643	38,643	38,643	
		Program increase for 1 REMUS 600 vehicle					[6,000]
029	0603216N	AVIATION SURVIVABILITY	11,919	11,919	11,919	11,919	
030	0603251N	AIRCRAFT SYSTEMS	1,473	1,473	1,473	1,473	
031	0603254N	ASW SYSTEMS DEVELOPMENT	7,172	7,172	7,172	7,172	
032	0603261N	TACTICAL AIRBORNE RECONNAISSANCE	3,419	3,419	3,419	3,419	
033	0603382N	ADVANCED COMBAT SYSTEMS TECHNOLOGY	64,694	64,694	64,694	64,694	
034	0603502N	SURFACE AND SHALLOW WATER MINE COUNTERMEASURES	507,000	312,200	134,500	310,500	
		Excess procurement ahead of satisfactory testing					[-196,500]
		LUSV Design Contracts early to need					[-29,100]
		LUSV GFE early to need					[-79,200]

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		LUSV program decrease		[-43,000]			
		MUSV program increase		[43,000]			
		Reduce one LUSV		[-86,500]			
		VLS concept design and LLTM early to need					
035	0603506N	SURFACE SHIP TORPEDO DEFENSE	15,800	15,800	15,800		7,242
		Excess shutdown costs					
036	0603512N	CARRIER SYSTEMS DEVELOPMENT	4,997	4,997	4,997		4,997
037	0603525N	PILOT FISH	291,148	291,148	291,148		186,328
		Program adjustment					
038	0603527N	RETRACT LARCH	11,980	11,980	11,980		11,980
039	0603536N	RETRACT JUNIPER	129,163	129,163	129,163		129,163
040	0603542N	RADIOLOGICAL CONTROL	689	689	689		689
041	0603553N	SURFACE ASW	1,137	1,137	1,137		1,137
042	0603561N	ADVANCED SUBMARINE SYSTEM DEVELOPMENT	148,756	148,756	153,756		120,046
		Program decrease					
		Project 2033: Test site emergent repairs			[5,000]		
		Project 9710: Unjustified new start					
043	0603562N	SUBMARINE TACTICAL WARFARE SYSTEMS	11,192	11,192	11,192		11,192
044	0603563N	SHIP CONCEPT ADVANCED DESIGN	81,846	67,846	57,846		57,846
		Early to need			[-24,000]		
		Future surface combatant concept development					
		Program increase					
		Program increase—moving target defense					
045	0603564N	SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES	69,084	59,084	22,484		22,584
		Early to need			[-46,600]		
		Program decrease					
046	0603570N	ADVANCED NUCLEAR POWER SYSTEMS	181,652	181,652	181,652		181,652

047	0603573N	ADVANCED SURFACE MACHINERY SYSTEMS	25,408	30,408	150,408	130,000	155,408
		Program increase		[5,000]		[5,000]	
		Surface combatant component-level prototyping			[125,000]	[125,000]	
048	0603576N	CHALK EAGLE	64,877	64,877	64,877		64,877
049	0603581N	LITTORAL COMBAT SHIP (LCS)	9,934	9,934	9,934		9,934
050	0603582N	COMBAT SYSTEM INTEGRATION	17,251	17,251	17,251		17,251
051	0603595N	OHIO REPLACEMENT	419,051	419,051	434,051	15,000	434,051
		Accelerate advanced propulsor development			[15,000]	[15,000]	
052	0603596N	LCS MISSION MODULES	108,505	108,505	103,505	-2,910	105,595
		Available prior year funds due to SUW MP testing delay			[-5,000]	[-2,910]	
053	0603597N	AUTOMATED TEST AND ANALYSIS	7,653	7,653	7,653		7,653
054	0603599N	FRIGATE DEVELOPMENT	59,007	59,007	59,007		59,007
055	0603609N	CONVENTIONAL MUNITIONS	9,988	9,988	9,988		9,988
056	0603635M	MARINE CORPS GROUND COMBAT/SUPPORT SYSTEM	86,464	11,464	86,464	-69,987	16,477
		Insufficient justification and contract delay		[-75,000]		[-69,987]	
057	0603654N	JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT	33,478	33,478	33,478		33,478
058	0603713N	OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT	5,619	5,619	5,619		5,619
059	0603721N	ENVIRONMENTAL PROTECTION	20,564	20,564	20,564		20,564
060	0603724N	NAVY ENERGY PROGRAM	26,514	49,514	26,514	23,000	49,514
		Battery development and safety enterprise		[13,000]		[13,000]	
		Marine energy systems for sensors and microgrids		[10,000]		[10,000]	
061	0603725N	FACILITIES IMPROVEMENT	3,440	3,440	3,440		3,440
062	0603734N	CHALK CORAL	346,800	346,800	346,800	-36,400	310,400
		Insufficient budget justification				[-36,400]	
063	0603739N	NAVY LOGISTIC PRODUCTIVITY	3,857	3,857	3,857		3,857
064	0603746N	RETRACT MAPLE	258,519	258,519	258,519		258,519
065	0603748N	LINK PLUMERIA	403,909	403,909	403,909	-7,400	396,509
		Insufficient budget justification				[-7,400]	
066	0603751N	RETRACT ELM	63,434	63,434	63,434		63,434
067	0603764N	LINK EVERGREEN	184,110	184,110	184,110		184,110
068	0603790N	NATO RESEARCH AND DEVELOPMENT	7,697	7,697	7,697		7,697
069	0603795N	LAND ATTACK TECHNOLOGY	9,086	9,086	9,086		9,086

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070	0603851M	JOINT NON-LETHAL WEAPONS TESTING	28,466	28,466	28,466		28,466
071	0603860N	JOINT PRECISION APPROACH AND LANDING SYSTEMS—DEWVAL	51,341	51,341	51,341		51,341
072	0603925N	DIRECTED ENERGY AND ELECTRIC WEAPON SYSTEMS	118,169	118,169	118,169		118,169
073	0604014N	F/A -18 INFRARED SEARCH AND TRACK (IRST)	113,456	112,456	113,456	-1,000	112,456
		Program delay		[-1,000]			
074	0604027N	DIGITAL WARFARE OFFICE	50,120	50,120	50,120	-25,000	25,120
		Artificial intelligence development operations unjustified growth				[-10,000]	
		Program decrease				[-15,000]	
075	0604028N	SMALL AND MEDIUM UNMANNED UNDERSEA VEHICLES	32,527	32,527	32,527		32,527
076	0604029N	UNMANNED UNDERSEA VEHICLE CORE TECHNOLOGIES	54,376	54,376	54,376		54,376
077	0604030N	RAPID PROTOTYPING, EXPERIMENTATION AND DEMONSTRATION	36,197	36,197	36,197		36,197
078	0604031N	LARGE UNMANNED UNDERSEA VEHICLES	68,310	59,810	68,310		68,310
		Early to need		[-8,500]			
079	0604112N	GERALD R. FORD CLASS NUCLEAR AIRCRAFT CARRIER (CVN 78—80)	121,310	121,310	121,310	-9,000	112,310
		Integrated digital shipbuilding insufficient budget justification				[-9,000]	
080	0604126N	LITTORAL AIRBORNE MCM	17,248	17,248	17,248		17,248
081	0604127N	SURFACE MINE COUNTERMEASURES	18,735	18,735	18,735		18,735
082	0604272N	TACTICAL AIR DIRECTIONAL INFRARED COUNTERMEASURES (TADIRCM) ..	68,346	58,346	68,346	-9,897	58,449
		Excess to need		[-10,000]			
084	0604289M	NEXT GENERATION LOGISTICS	4,420	4,420	13,420	9,000	13,420
		Additive manufacturing logistics software pilot			[9,000]		
085	0604320M	RAPID TECHNOLOGY CAPABILITY PROTOTYPE	4,558	4,558	4,558		4,558
086	0604454N	LX (R)	12,500	12,500	12,500		12,500
087	0604536N	ADVANCED UNDERSEA PROTOTYPING	181,967	174,437	181,967		181,967
		ORCA XLUUV prior year carryover		[-7,530]			
088	0604636N	COUNTER UNMANNED AIRCRAFT SYSTEMS (C-UAS)	5,500	5,500	5,500		5,500
089	0604659N	PRECISION STRIKE WEAPONS DEVELOPMENT PROGRAM	718,148	638,148	723,148	-30,000	688,148

090	0604707N	Excess growth	[-80,000]	[5,000]	[-30,000]	5,263	5,263	
		Increase for SLCM-N AOA		5,263				
		SPACE AND ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT.						
091	0604786N	OFFENSIVE ANTI-SURFACE WARFARE WEAPON DEVELOPMENT		65,419		65,419	65,419	
092	0303354N	ASW SYSTEMS DEVELOPMENT—MIP		9,991		9,991	9,991	
093	0304240M	ADVANCED TACTICAL UNMANNED AIRCRAFT SYSTEM		39,657	18,500	21,157	39,657	
		KMAX Large Unmanned Logistics System USMC unfunded priority		[18,500]	[18,500]			
095	0304270N	ELECTRONIC WARFARE DEVELOPMENT—MIP		609		609	609	
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES		5,559,062	-399,182	5,275,962	5,159,880	
		SYSTEM DEVELOPMENT & DEMONSTRATION						
096	0603208N	TRAINING SYSTEM AIRCRAFT	15,514	15,514		15,514	15,514	
097	0604212N	OTHER HELO DEVELOPMENT	28,835	28,835		28,835	28,835	
098	0604214M	AV-8B AIRCRAFT—ENG DEV	27,441	27,441		27,441	27,441	
100	0604215N	STANDARDS DEVELOPMENT	3,642	3,642		3,642	3,642	
101	0604216N	MULTI-MISSION HELICOPTER UPGRADE DEVELOPMENT	19,196	19,196		19,196	19,196	
104	0604230N	WARFARE SUPPORT SYSTEM	8,601	8,601		8,601	8,601	
105	0604231N	TACTICAL COMMAND SYSTEM	77,232	77,232		77,232	77,232	
106	0604234N	ADVANCED HAWKEYE	232,752	232,752		232,752	232,752	
107	0604245M	H-1 UPGRADES	64,859	64,859		64,859	64,859	
		Support cost growth	[-500]					
109	0604261N	ACOUSTIC SEARCH SENSORS	47,013	47,013		47,013	47,013	
110	0604262N	V-22A	185,105	172,105	5,000	190,605	190,105	
		Excess to need	[-13,000]					
		Increase reliability and reduce vibrations of V-22 nacelles		15,500]	15,000]			
111	0604264N	AIR CREW SYSTEMS DEVELOPMENT	21,172	21,172		21,172	21,172	
112	0604269N	EA-18	143,585	123,585	-10,000	143,585	133,585	
		Unjustified cost growth	[-20,000]		[-10,000]			
113	0604270N	ELECTRONIC WARFARE DEVELOPMENT	116,811	109,651	-7,160	116,811	109,651	
		Unjustified request	[-7,160]		[-7,160]			
114	0604273M	EXECUTIVE HELO DEVELOPMENT	187,436	187,436		187,436	187,436	

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116	0604274N	NEXT GENERATION JAMMER (NGJ) Underexecution	524,261	443,261	524,261	-76,000	448,261
117	0604280N	JOINT TACTICAL RADIO SYSTEM—NAVY (JTRS-NAVY) Early to need	192,345	190,845	192,345	-1,500	190,845
118	0604282N	NEXT GENERATION JAMMER (NGJ) INCREMENT II Program reduction	111,068	111,068	111,068	0	90,922
119	0604307N	SURFACE COMBATANT COMBAT SYSTEM ENGINEERING Aegis development support studies and analysis early to need	415,625	415,625	415,625	0	413,684
120	0604311N	LPD-17 CLASS SYSTEMS INTEGRATION	640	640	640	0	640
121	0604329N	SMALL DIAMETER BOMB (SDB)	50,096	50,096	50,096	0	50,096
122	0604366N	STANDARD MISSILE IMPROVEMENTS	232,391	232,391	232,391	0	232,391
123	0604373N	AIRBORNE MCM	10,916	10,916	10,916	0	10,916
124	0604378N	NAVAL INTEGRATED FIRE CONTROL—COUNTER AIR SYSTEMS ENGINEER- ING.	33,379	33,379	33,379	0	33,379
125	0604501N	ADVANCED ABOVE WATER SENSORS	34,554	34,554	34,554	0	34,554
126	0604503N	SSN-688 AND TRIDENT MODERNIZATION	84,663	84,663	84,663	0	84,663
127	0604504N	AIR CONTROL	44,923	44,923	44,923	0	44,923
128	0604512N	SHIPBOARD AVIATION SYSTEMS	10,632	10,632	10,632	0	10,632
129	0604518N	COMBAT INFORMATION CENTER CONVERSION	16,094	16,094	16,094	0	16,094
130	0604522N	AIR AND MISSILE DEFENSE RADAR (AMDR) SYSTEM Engineering changes testing and evaluation early to need	55,349	55,349	55,349	-3,000	52,349
131	0604530N	ADVANCED ARRESTING GEAR (AAG)	123,490	123,490	123,490	0	123,490
132	0604558N	NEW DESIGN SSN	121,010	121,010	121,010	0	221,010
133	0604562N	Accelerate capability development	62,426	62,426	62,426	0	62,426
134	0604567N	SUBMARINE TACTICAL WARFARE SYSTEM SHIP CONTRACT DESIGN/ LIVE FIRE T&E Program increase	46,809	56,809	46,809	100,000	46,809

135	0604574N	NAVY TACTICAL COMPUTER RESOURCES	3,692	3,692	3,692	3,692	3,692	
137	0604601N	MINE DEVELOPMENT	28,964	28,964	100,264	28,964	28,964	
		UPL Quickstrike JDAM ER			[71,300]			
138	0604610N	LIGHTWEIGHT TORPEDO DEVELOPMENT	148,349	127,349	148,349	148,349	115,541	
		Excess to need		[-21,000]			[-32,808]	
139	0604654N	JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT	8,237	8,237	8,237	8,237	8,237	
140	0604657M	USMC GROUND COMBAT/SUPPORTING ARMS SYSTEMS—ENG DEV	22,000	22,000	22,000	22,000	22,000	
141	0604703N	PERSONNEL, TRAINING, SIMULATION, AND HUMAN FACTORS	5,500	5,500	5,500	5,500	5,500	
142	0604727N	JOINT STANDOFF WEAPON SYSTEMS	18,725	16,225	18,725	18,725	16,225	
		Excess to need		[-2,500]			[-2,500]	
143	0604755N	SHIP SELF DEFENSE (DETECT & CONTROL)	192,603	192,603	192,603	192,603	180,085	
		Project 2178 prior year carryover					[-12,518]	
144	0604756N	SHIP SELF DEFENSE (ENGAGE: HARD KILL)	137,268	137,268	137,268	137,268	121,630	
		Project 2070 excess test assets					[-15,638]	
145	0604757N	SHIP SELF DEFENSE (ENGAGE: SOFT KILL/EW)	97,363	97,363	97,363	97,363	97,363	
146	0604761N	INTELLIGENCE ENGINEERING	26,710	26,710	26,710	26,710	26,710	
147	0604771N	MEDICAL DEVELOPMENT	8,181	13,181	8,181	8,181	8,181	
		Enterotoxigenic escherichia coli research		[5,000]				
148	0604777N	NAVIGATION/ID SYSTEM	40,755	40,755	40,755	40,755	40,755	
149	0604800M	JOINT STRIKE FIGHTER (JSF)—EMD	1,710	1,710	1,710	1,710	1,710	
150	0604800N	JOINT STRIKE FIGHTER (JSF)—EMD	1,490	1,490	1,490	1,490	1,490	
153	0605013M	INFORMATION TECHNOLOGY DEVELOPMENT	1,494	1,494	1,494	1,494	1,494	
154	0605013N	INFORMATION TECHNOLOGY DEVELOPMENT	384,162	370,662	328,762	328,762	268,364	
		eProcurement program duplication					[-115,798]	
		Program decrease					[-36,000]	
		Unjustified growth over FY19 projection		[-13,500]			[-79,798]	
155	0605024N	ANTI-TAMPER TECHNOLOGY SUPPORT	4,882	4,882	4,882	4,882	4,882	
156	0605212M	CH—53K RDTE	516,955	496,955	506,955	506,955	516,955	
		Early to need					[-10,000]	
		Excess to need		[-20,000]				
158	0605215N	MISSION PLANNING	75,886	75,886	75,886	75,886	75,886	
159	0605217N	COMMON AVIONICS	43,187	43,187	43,187	43,187	43,187	

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160	0605220N	SHIP TO SHORE CONNECTOR (SSC)	4,909	4,909	19,909	15,000	19,909
		Expand development and use of composite materials			[15,000]	[15,000]	
161	0605327N	T-AO 205 CLASS	1,682	1,682	1,682		1,682
162	0605414N	UNMANNED CARRIER AVIATION (UCA)	671,258	671,258	671,258	-14,160	657,098
		UMCS excess to need				[-14,160]	
163	0605450M	JOINT AIR-TO-GROUND MISSILE (JAGM)	18,393	12,393	18,393		18,393
		Schedule delays		[-6,000]			
165	0605500N	MULTI-MISSION MARITIME AIRCRAFT (MMA)	21,472	21,472	21,472		21,472
166	0605504N	MULTI-MISSION MARITIME (MMA) INCREMENT III	177,234	177,234	177,234		177,234
167	0605611M	MARINE CORPS ASSAULT VEHICLES SYSTEM DEVELOPMENT & DEMONSTRATION.	77,322	69,121	77,322	-8,201	69,121
		Early to need		[-2,201]		[-2,201]	
		Excess growth		[-6,000]		[-6,000]	
168	0605813M	JOINT LIGHT TACTICAL VEHICLE (JLV) SYSTEM DEVELOPMENT & DEMONSTRATION.	2,105	2,105	2,105		2,105
169	0204202N	DDG-1000	111,435	111,435	111,435		111,435
172	0304785N	TACTICAL CRYPTOLOGIC SYSTEMS	101,339	101,339	101,339		101,339
173	0306250M	CYBER OPERATIONS TECHNOLOGY DEVELOPMENT	26,406	26,406	26,406		26,406
		SUBTOTAL SYSTEM DEVELOPMENT & DEMONSTRATION	6,332,033	6,152,672	6,358,433	-201,370	6,130,663
		MANAGEMENT SUPPORT					
174	0604256N	THREAT SIMULATOR DEVELOPMENT	66,678	66,678	66,678		66,678
175	0604258N	TARGET SYSTEMS DEVELOPMENT	12,027	12,027	12,027		12,027
176	0604759N	MAJOR T&E INVESTMENT	85,348	85,348	85,348		85,348
178	0605152N	STUDIES AND ANALYSIS SUPPORT—NAVY	3,908	3,908	3,908		3,908
179	0605154N	CENTER FOR NAVAL ANALYSES	47,669	47,669	47,669		47,669
180	0605285N	NEXT GENERATION FIGHTER	20,698	20,698	20,698		20,698

182	0605804N	TECHNICAL INFORMATION SERVICES	988	988	988	988
183	0605853N	MANAGEMENT, TECHNICAL & INTERNATIONAL SUPPORT	102,401	102,401	102,401	102,401
184	0605856N	STRATEGIC TECHNICAL SUPPORT	3,742	3,742	3,742	3,742
186	0605863N	RDT&E SHIP AND AIRCRAFT SUPPORT	93,872	93,872	93,872	93,872
187	0605864N	TEST AND EVALUATION SUPPORT	394,020	394,020	394,020	394,020
188	0605865N	OPERATIONAL TEST AND EVALUATION CAPABILITY	25,145	25,145	25,145	25,145
189	0605866N	NAVY SPACE AND ELECTRONIC WARFARE (SEW) SUPPORT	15,773	15,773	15,773	15,773
190	0605867N	SEW SURVEILLANCE/RECONNAISSANCE SUPPORT	8,402	8,402	8,402	8,402
191	0605873M	MARINE CORPS PROGRAM WIDE SUPPORT	37,265	37,265	37,265	37,265
		Unjustified growth	[-8,000]	[-8,000]	[-8,000]	[-8,000]
192	0605898N	MANAGEMENT HQ—R&D	39,673	39,673	39,673	39,673
193	0606355N	WARFARE INNOVATION MANAGEMENT	28,750	28,750	28,750	28,750
196	0305327N	INSIDER THREAT	2,645	2,645	2,645	2,645
197	0902498N	MANAGEMENT HEADQUARTERS (DEPARTMENTAL SUPPORT ACTIVITIES)	1,460	1,460	1,460	1,460
		SUBTOTAL MANAGEMENT SUPPORT	990,464	990,464	990,464	990,464
						-8,000
OPERATIONAL SYSTEMS DEVELOPMENT						
UNDISTRIBUTED						
202	0604227N	HARPOON MODIFICATIONS	2,302	2,302	2,302	2,302
203	0604840M	F-35 C2D2	422,881	422,881	422,881	422,881
204	0604840N	F-35 C2D2	383,741	383,741	383,741	383,741
205	0607658N	COOPERATIVE ENGAGEMENT CAPABILITY (CEC)	127,924	127,924	127,924	127,924
207	0101221N	STRATEGIC SUB & WEAPONS SYSTEM SUPPORT	157,676	157,676	157,676	157,676
		D5LE2 unjustified request				-44,184
						[-44,184]
208	0101224N	SSBN SECURITY TECHNOLOGY PROGRAM	43,354	43,354	43,354	43,354
209	0101226N	SUBMARINE ACOUSTIC WARFARE DEVELOPMENT	6,815	6,815	6,815	6,815
210	0101402N	NAVY STRATEGIC COMMUNICATIONS	31,174	31,174	31,174	31,174
211	0204136N	F/A-18 SQUADRONS	216,215	213,715	216,215	208,215
		Block III support prior year carryover	[-7,500]	[-7,500]	[-7,500]	-5,500
		Jet noise reduction research	[10,000]	[2,000]	[10,000]	[-7,500]
213	0204228N	SURFACE SUPPORT	45,389	36,389	45,389	36,389
		WSN-12 Technology Insertion	[9,000]		[9,000]	

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214	0204229N	TOMAHAWK AND TOMAHAWK MISSION PLANNING CENTER (TMPC)	320,134	320,134	320,134	-33,335	286,799
		JMEWS schedule delays				[-12,098]	
		Maritime strike schedule delays				[-21,237]	
215	020431IN	INTEGRATED SURVEILLANCE SYSTEM	88,382	88,382	103,382	15,000	103,382
		Additional TRAPS units			[15,000]	[15,000]	
216	0204313N	SHIP-TOWED ARRAY SURVEILLANCE SYSTEMS	14,449	14,449	14,449		14,449
217	0204413N	AMPHIBIOUS TACTICAL SUPPORT UNITS (DISPLACEMENT CRAFT)	6,931	6,931	6,931		6,931
218	0204460M	GROUND/AIR TASK ORIENTED RADAR (G/ATOR)	23,891	23,891	23,891		23,891
219	020457IN	CONSOLIDATED TRAINING SYSTEMS DEVELOPMENT	129,873	129,873	129,873		129,873
221	0204575N	ELECTRONIC WARFARE (EW) READINESS SUPPORT	82,325	62,325	82,325	-19,891	62,434
		Prior year carryover		[-20,000]		[-19,891]	
222	020560IN	HARM IMPROVEMENT	138,431	132,431	138,431	-6,060	132,371
		AARGM ER test schedule discrepancy		[-6,000]		[-6,060]	
224	0205620N	SURFACE ASW COMBAT SYSTEM INTEGRATION	29,572	29,572	29,572		29,572
225	0205632N	MK-48 ADCAP	85,973	85,973	85,973		85,973
226	0205633N	AVIATION IMPROVEMENTS	125,461	125,461	125,461		125,461
227	0205675N	OPERATIONAL NUCLEAR POWER SYSTEMS	106,192	106,192	106,192		106,192
228	0206313M	MARINE CORPS COMMUNICATIONS SYSTEMS	143,317	134,317	143,317	-9,000	134,317
		Program delay		[-9,000]		[-9,000]	
229	0206335M	COMMON AVIATION COMMAND AND CONTROL SYSTEM (CAC2S)	4,489	4,489	4,489		4,489
230	0206623M	MARINE CORPS GROUND COMBAT/SUPPORTING ARMS SYSTEMS	51,788	51,788	51,788		51,788
231	0206624M	MARINE CORPS COMBAT SERVICES SUPPORT	37,761	37,761	42,761	5,000	42,761
		Airborne Power Generation Tech Development			[5,000]	[5,000]	
232	0206625M	USMC INTELLIGENCE/ELECTRONIC WARFARE SYSTEMS (MIP)	21,458	21,458	21,458		21,458
233	0206629M	AMPHIBIOUS ASSAULT VEHICLE	5,476	5,476	5,476		5,476
234	0207161N	TACTICAL AIM MISSILES	19,488	19,488	19,488		19,488
235	0207163N	ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE (AMRAAM)	39,029	34,529	39,029		39,029

239	0303109N	Prior year carryover							
240	0303138N	SATELLITE COMMUNICATIONS (SPACE)	34,344	34,344	34,344	34,344	34,344	34,344	34,344
241	0303140N	CONSOLIDATED AFLOAT NETWORK ENTERPRISE SERVICES (CANES)	22,873	22,873	22,873	22,873	22,873	22,873	22,873
243	0305192N	INFORMATION SYSTEMS SECURITY PROGRAM	41,853	41,853	41,853	41,853	41,853	41,853	41,853
244	0305204N	MILITARY INTELLIGENCE PROGRAM (MIP) ACTIVITIES	8,913	8,913	8,913	8,913	8,913	8,913	8,913
245	0305205N	TACTICAL UNMANNED AERIAL VEHICLES	9,451	9,451	9,451	9,451	9,451	9,451	9,451
246	0305208M	UAS INTEGRATION AND INTEROPERABILITY	42,315	42,315	42,315	42,315	42,315	42,315	42,315
248	0305220N	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	22,042	22,042	22,042	22,042	22,042	22,042	22,042
249	0305220N	MQ-4C TRITON	11,784	11,784	11,784	11,784	11,784	11,784	11,784
250	0305232M	MQ-8 UAV	29,618	29,618	29,618	29,618	29,618	29,618	29,618
251	0305234N	RQ-11 UAV	509	509	509	509	509	509	509
252	0305239M	SMALL (LEVEL 0) TACTICAL UAS (STUASLO)	11,545	11,545	11,545	11,545	11,545	11,545	11,545
253	0305241N	RQ-21A	10,914	10,914	10,914	10,914	10,914	10,914	10,914
254	0305242M	MULTI-INTELLIGENCE SENSOR DEVELOPMENT	70,612	70,612	70,612	70,612	70,612	70,612	70,612
255	0305421N	UNMANNED AERIAL SYSTEMS (UAS) PAYLOADS (MIP)	3,704	3,704	3,704	3,704	3,704	3,704	3,704
		RQ-4 MODERNIZATION	202,346	202,346	202,346	202,346	202,346	202,346	185,446
		IFC 5.0 concurrency							-16,900
256	0308601N	MODELING AND SIMULATION SUPPORT	7,119	7,119	7,119	7,119	7,119	7,119	7,119
257	0702207N	DEPOT MAINTENANCE (NON-IF)	38,182	38,182	38,182	38,182	38,182	38,182	38,182
258	0708730N	MARITIME TECHNOLOGY (MARITECH)	6,779	6,779	6,779	6,779	6,779	6,779	6,779
259	1203109N	SATELLITE COMMUNICATIONS (SPACE)	15,868	15,868	15,868	15,868	15,868	15,868	15,868
259A	99999999999	CLASSIFIED PROGRAMS	1,613,137	1,613,137	1,613,137	1,613,137	1,613,137	1,613,137	1,613,137
		SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT	5,104,299	5,076,299	5,124,299	5,124,299	5,124,299	4,989,429	4,989,429
		SUBTOTAL UNDISTRIBUTED	-28,000	-28,000	20,000	20,000	-114,870	-114,870	-114,870
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, NAVY	20,270,499	19,868,808	20,066,799	20,066,799	-595,895	19,674,604	19,674,604
		RESEARCH, DEVELOPMENT, TEST & EVAL, AF							
		BASIC RESEARCH							
001	0601102F	DEFENSE RESEARCH SCIENCES	356,107	356,107	356,107	356,107	356,107	356,107	356,107
002	0601103F	UNIVERSITY RESEARCH INITIATIVES	158,859	163,859	158,859	158,859	158,859	163,859	163,859
		Program increase		[5,000]				[5,000]	

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003	0601108F	HIGH ENERGY LASER RESEARCH INITIATIVES	14,795	14,795	14,795		14,795
		SUBTOTAL BASIC RESEARCH	529,761	534,761	529,761	5,000	534,761
		APPLIED RESEARCH					
004	0602102F	MATERIALS	128,851	143,851	122,851	24,000	152,851
		Advanced materials high energy x-ray		[4,000]	[4,000]	[4,000]	
		Advanced materials manufacturing flexible biosensors		[5,000]	[5,000]	[5,000]	
		Advanced thermal protection systems		[5,000]	[5,000]	[5,000]	
		Duplicative material research			[-10,000]		
		Program increase		[5,000]		[10,000]	
005	0602201F	AEROSPACE VEHICLE TECHNOLOGIES	147,724	147,724	137,724		147,724
		Reduce program growth			[-10,000]		
006	0602202F	HUMAN EFFECTIVENESS APPLIED RESEARCH	131,795	131,795	131,795		131,795
007	0602203F	AEROSPACE PROPULSION	198,775	213,775	198,775	10,000	208,775
		Educational partnership agreements for aerospace propulsion		[10,000]		[5,000]	
		Educational partnership agreements for next generation liquid propulsion.					
		Electrical power/thermal management systems		[5,000]		[5,000]	
008	0602204F	AEROSPACE SENSORS	202,912	202,912	202,912		202,912
010	0602298F	SCIENCE AND TECHNOLOGY MANAGEMENT— MAJOR HEADQUARTERS ACTIVITIES.	7,968	7,968	7,968		7,968
012	0602602F	CONVENTIONAL MUNITIONS	142,772	142,772	142,772		142,772
013	0602605F	DIRECTED ENERGY TECHNOLOGY	124,379	124,379	124,379		124,379
014	0602788F	DOMINANT INFORMATION SCIENCES AND METHODS	181,562	196,562	199,062	18,000	199,562
		Counter UAS cyber		[2,500]			
		Cyberspace dominance technology research			[10,000]		
		Detection and countering of adversarial UAS		[5,000]		[5,000]	

015	0602890F	Quantum Information Science Innovation Center		[10,000]		[8,000]	
		Quantum science	44,221	44,221	15,000]	[5,000]	44,221
		HIGH ENERGY LASER RESEARCH			49,221		
		High power microwave research			[5,000]		
016	1206601F	SPACE TECHNOLOGY	124,667	124,667	124,667		124,667
		SUBTOTAL APPLIED RESEARCH	1,435,626	1,480,626	1,442,126	52,000	1,487,626
ADVANCED TECHNOLOGY DEVELOPMENT							
017	0603112F	ADVANCED MATERIALS FOR WEAPON SYSTEMS	36,586	41,586	38,586	5,000	41,586
		Metals affordability initiative		[5,000]	[2,000]	[5,000]	
018	0603199F	SUSTAINMENT SCIENCE AND TECHNOLOGY (S&T)	16,249	16,249	16,249		16,249
019	0603203F	ADVANCED AEROSPACE SENSORS	38,292	38,292	38,292		38,292
020	0603211F	AEROSPACE TECHNOLOGY DEV/DEMO	102,949	122,949	307,949	100,000	202,949
		Accelerate air breathing hypersonic program			[75,000]		
		Active winglets development			[5,000]		
		Advanced Personnel Recovery			[25,000]		
		High speed vertical lift demonstration		[5,000]			
		LCAAT			[100,000]		
		Low cost attritable aircraft technology		[15,000]			
021	0603216F	AEROSPACE PROPULSION AND POWER TECHNOLOGY	113,973	118,973	123,973	15,000	128,973
		Advanced turbine engine gas generator			[10,000]		
		Electrical power systems		[5,000]			
022	0603270F	ELECTRONIC COMBAT TECHNOLOGY	48,408	48,408	38,408		48,408
		Duplicative EW & PNT research			[-10,000]		
023	0603401F	ADVANCED SPACECRAFT TECHNOLOGY	70,525	70,525	73,525	3,000	73,525
		Strategic radiation hardened microelectronic processors			[3,000]		
024	0603444F	MAUI SPACE SURVEILLANCE SYSTEM (MSSS)	11,878	11,878	11,878		11,878
025	0603456F	HUMAN EFFECTIVENESS ADVANCED TECHNOLOGY DEVELOPMENT	37,542	37,542	37,542		37,542
026	0603601F	CONVENTIONAL WEAPONS TECHNOLOGY	225,817	225,817	225,817		225,817
027	0603605F	ADVANCED WEAPONS TECHNOLOGY	37,404	37,404	37,404		37,404
028	0603680F	MANUFACTURING TECHNOLOGY PROGRAM	43,116	59,116	50,116	23,000	66,116
		Advanced materials and materials manufacturing			[7,000]		

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029	0603788F	Aerospace composites manufacturing		[10,000]		[10,000]	
		Program increase		[6,000]		[6,000]	
		BATTLESPACE KNOWLEDGE DEVELOPMENT AND DEMONSTRATION	56,414	56,414	66,414		56,414
		Cyber applied research		[10,000]			
		SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT	839,153	885,153	1,066,153	146,000	985,153
		ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES					
031	0603260F	INTELLIGENCE ADVANCED DEVELOPMENT	5,672	5,672	5,672		5,672
032	0603742F	COMBAT IDENTIFICATION TECHNOLOGY	27,085	27,085	27,085		27,085
033	0603790F	NATO RESEARCH AND DEVELOPMENT	4,955	4,955	4,955		4,955
034	0603851F	INTERCONTINENTAL BALLISTIC MISSILE—DEMVAL	44,109	44,109	44,109		44,109
036	0604002F	AIR FORCE WEATHER SERVICES RESEARCH	772	772	772		772
037	0604004F	ADVANCED ENGINE DEVELOPMENT	878,442	849,442	878,442		878,442
		Unjustified budget growth		[-29,000]			
038	0604015F	LONG RANGE STRIKE—BOMBER	3,003,899	3,003,899	3,003,899		3,003,899
039	0604032F	DIRECTED ENERGY PROTOTYPING	10,000	20,000	10,000	10,000	20,000
		High-value airborne asset protection		[10,000]		[10,000]	
040	0604033F	HYPERSONICS PROTOTYPING	576,000	536,000	576,000		576,000
		Program concurrency		[-40,000]			
041	0604201F	PNT RESILIENCY, MODS, AND IMPROVEMENTS	92,600	124,600	124,600	32,000	124,600
		Program increase		[32,000]		[32,000]	
		UPL M-CODE acceleration			[32,000]		
042	0604257F	ADVANCED TECHNOLOGY AND SENSORS	23,145	23,145	23,145		23,145
043	0604288F	NATIONAL AIRBORNE OPS CENTER (NAOC) RECAP	16,669	16,669	16,669		16,669
044	0604317F	TECHNOLOGY TRANSFER	23,614	23,614	23,614		23,614
045	0604327F	HARD AND DEEPLY BURIED TARGET DEFEAT SYSTEM (HDBTDS) PRO-GRAM.	113,121	113,121	113,121		113,121

046	0604414F	CYBER RESILIENCY OF WEAPON SYSTEMS-ACS	56,325	56,325	56,325	56,325	56,325
047	0604776F	DEPLOYMENT & DISTRIBUTION ENTERPRISE R&D	28,034	28,034	28,034	28,034	28,034
048	0604858F	TECH TRANSITION PROGRAM	128,476	128,476	134,476	134,476	134,476
		Rapid repair			[6,000]	6,000	
049	0605230F	GROUND BASED STRATEGIC DETERRENT	570,373	489,395	592,373	552,395	552,395
		Program consolidation			[22,000]		
		Program reduction			[22,000]		
		Technical adjustment for NC3			[22,022]		
050	0207100F	LIGHT ATTACK ARMED RECONNAISSANCE (LAAR) SQUADRONS	35,000	35,000	85,000	35,000	35,000
		Light attack experiment			[50,000]		
051	0207110F	NEXT GENERATION AIR DOMINANCE	1,000,000	500,000	1,000,000	955,000	955,000
		Cost-risk associated with development profile			[500,000]		
052	0207455F	THREE DIMENSIONAL LONG-RANGE RADAR (3DELRR)	37,290	37,290	37,290	37,290	37,290
053	0208099F	UNIFIED PLATFORM (UP)	10,000	10,000	10,000	10,000	10,000
054	0305236F	COMMON DATA LINK EXECUTIVE AGENT (CDL EA)	36,910	36,910	36,910	36,910	36,910
055	0305251F	CYBERSPACE OPERATIONS FORCES AND FORCE SUPPORT	35,000	35,000	35,000	35,000	35,000
056	0305601F	MISSION PARTNER ENVIRONMENTS	8,550	8,550	8,550	8,550	8,550
057	0306250F	CYBER OPERATIONS TECHNOLOGY DEVELOPMENT	198,864	198,864	240,064	240,064	240,064
		Accelerate development of Cyber National Mission Force capabilities.			[13,600]		
		ETERNALDARKNESS			[7,100]		
		Joint Common Access Platform			[20,500]		
058	0306415F	ENABLED CYBER ACTIVITIES	16,632	16,632	16,632	16,632	16,632
060	0901410F	CONTRACTING INFORMATION TECHNOLOGY SYSTEM	20,830	20,830	20,830	20,830	20,830
061	1203164F	NAVSTAR GLOBAL POSITIONING SYSTEM (USER EQUIPMENT) (SPACE)	329,948	329,948	329,948	329,948	329,948
062	1203710F	EO/IR WEATHER SYSTEMS	101,222	101,222	101,222	101,222	101,222
063	1206422F	WEATHER SYSTEM FOLLOW-ON	225,660	205,660	225,660	205,660	205,660
		Unjustified growth			[20,000]		
064	1206425F	SPACE SITUATION AWARENESS SYSTEMS	29,776	29,776	29,776	29,776	29,776
065	1206427F	SPACE SYSTEMS PROTOTYPE TRANSITIONS (SSPT)	142,045	162,045	142,045	142,045	142,045
		Accelerate BlackJack prototype demonstration and tech maturation			[20,000]		
067	1206438F	SPACE CONTROL TECHNOLOGY	64,231	58,231	64,231	59,231	59,231
		Accelerate development of Cyber National Mission Force capabilities.			[5,000]		

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068	1206730F	Unjustified growth		[-6,000]		[-5,000]	
		SPACE SECURITY AND DEFENSE PROGRAM	56,385	56,385	56,385		56,385
069	1206760F	PROTECTED TACTICAL ENTERPRISE SERVICE (PTES)	105,003	105,003	95,003		105,003
		Unjustified growth			[-10,000]		
070	1206761F	PROTECTED TACTICAL SERVICE (PTS)	173,694	166,194	163,694	-10,000	163,694
		Unjustified growth		[-7,500]	[-10,000]	[-10,000]	
071	1206855F	EVOLVED STRATEGIC SATCOM (ESS)	172,206	172,206	172,206		172,206
072	1206857F	SPACE RAPID CAPABILITIES OFFICE	33,742	30,742	33,742	-10,000	23,742
		Program decrease		[-3,000]		[-10,000]	
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES	8,436,279	7,811,801	8,567,479	-18,778	8,417,501
SYSTEM DEVELOPMENT & DEMONSTRATION							
073	0604200F	FUTURE ADVANCED WEAPON ANALYSIS & PROGRAMS	246,200	200	97,120	-246,200	
		ERWin contract delay			[-149,080]		
		Excess to need				[-246,200]	
		Unjustified requirement					
074	0604201F	PNT RESILIENCY, MODS, AND IMPROVEMENTS	67,782	67,782	148,782	81,000	148,782
		UPL M-Code Acceleration			[81,000]	[81,000]	
075	0604222F	NUCLEAR WEAPONS SUPPORT	4,406	4,406	4,406		4,406
076	0604270F	ELECTRONIC WARFARE DEVELOPMENT	2,066	2,066	2,066		2,066
077	0604281F	TACTICAL DATA NETWORKS ENTERPRISE	229,631	210,331	229,631	-19,300	210,331
		Prior-year carryover		[-19,300]		[-19,300]	
078	0604287F	PHYSICAL SECURITY EQUIPMENT	9,700	9,700	9,700		9,700
079	0604329F	SMALL DIAMETER BOMB (SDB)—EMD	31,241	41,241	31,241	10,000	41,241
		Program efficiency initiative		[10,000]		[10,000]	
080	0604429F	AIRBORNE ELECTRONIC ATTACK	2	2	2		2
081	0604602F	ARMAMENT/ORDNANCE DEVELOPMENT	28,043	22,543	28,043		28,043

082	0604604F	Unjustified requirement (JAGM-F)					
083	0604617F	SUBMUNITIONS	3,045	3,045	3,045	3,045	3,045
084	0604706F	AGILE COMBAT SUPPORT	19,944	19,944	19,944	19,944	19,944
085	0604735F	LIFE SUPPORT SYSTEMS	8,624	8,624	8,624	8,624	8,624
086	0604800F	Next-gen ejection seat qualification		[8,000]			
087	0604932F	COMBAT TRAINING RANGES	37,365	37,365	37,365	37,365	37,365
088	0604933F	F-35—EMD	7,628	7,628	7,628	7,628	7,628
089	0605030F	LONG RANGE STANDOFF WEAPON	712,539	712,539	712,539	712,539	712,539
091	0605056F	ICBM FUZE MODERNIZATION	161,199	161,199	161,199	161,199	161,199
093	0605221F	Program decrease		[-5,000]			
094	0605223F	JOINT TACTICAL NETWORK CENTER (JTNC)	2,414	2,414	2,414	2,414	2,414
095	0605229F	OPEN ARCHITECTURE MANAGEMENT	30,000	30,000	30,000	30,000	30,000
098	0605931F	KC-46	59,561	59,561	59,561	59,561	59,561
099	0101125F	ADVANCED PILOT TRAINING	348,473	348,473	348,473	348,473	348,473
100	0101213F	COMBAT RESCUE HELICOPTER	247,047	246,047	247,047	247,047	247,047
101	0207171F	Support cost growth		[-1,000]			
102	0207328F	B-2 DEFENSIVE MANAGEMENT SYSTEM	294,400	294,400	294,400	294,400	294,400
103	0207701F	NUCLEAR WEAPONS MODERNIZATION	27,564	27,564	27,564	27,564	27,564
106	0401310F	MINUTEMAN SQUADRONS	1	1	1	1	1
107	0401319F	F-15 EPAWSS	47,322	47,322	47,322	47,322	47,322
108	0701212F	STAND IN ATTACK WEAPON	162,840	127,840	162,840	162,840	162,840
109	1203176F	Unjustified program growth		[-35,000]			
110	1203269F	FULL COMBAT MISSION TRAINING	9,797	9,797	9,797	9,797	9,797
111	1203940F	C-32 EXECUTIVE TRANSPORT RECAPITALIZATION	9,930	9,930	9,930	9,930	9,930
112	1206421F	VC-25B	757,923	757,923	757,923	757,923	757,923
		AUTOMATED TEST SYSTEMS	2,787	2,787	2,787	2,787	2,787
		COMBAT SURVIVOR EVADER LOCATOR	2,000	2,000	2,000	2,000	2,000
		GPS III FOLLOW-ON (GPS IIIF)	462,875	452,875	462,875	462,875	452,875
		Unjustified growth		[-10,000]			
		SPACE SITUATION AWARENESS OPERATIONS	76,829	56,829	76,829	76,829	56,829
		GBOSS unjustified growth		[-20,000]			
		COUNTERSPACE SYSTEMS	29,037	34,037	29,037	29,037	29,037

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		Counterspace communications systems pre-planned product improvement.		[5,000]			
113	1206422F	WEATHER SYSTEM FOLLOW-ON	2,237	2,237	2,237		2,237
114	1206425F	SPACE SITUATION AWARENESS SYSTEMS	412,894	362,894	412,894		412,894
		Unexecutable growth		[-50,000]			
115	1206426F	SPACE FENCE			20,000		
		Space Fence		[20,000]			
116	1206431F	ADVANCED EHF MILSATCOM (SPACE)	117,290	117,290	117,290		117,290
117	1206432F	POLAR MILSATCOM (SPACE)	427,400	427,400	427,400		401,400
		Prior year carryover				-26,000	
118	1206433F	WIDEBAND GLOBAL SATCOM (SPACE)	1,920	1,920	1,920		1,920
119	1206441F	SPACE BASED INFRARED SYSTEM (SBIRS) HIGH EMD	1	1	1		1
120	1206442F	NEXT GENERATION OPTR	1,395,278	1,018,878	1,395,278		1,395,278
		Unexecutable funding profile		[-293,100]			
		Unexecutable funding profile (ground)		[-83,300]			
121	1206445F	COMMERCIAL SATCOM (COMSATCOM) INTEGRATION		10,000		5,000	5,000
		Accelerate integration of COMSATCOM capabilities		[10,000]		[5,000]	
122	1206853F	NATIONAL SECURITY SPACE LAUNCH PROGRAM (SPACE)—EMD	432,009	432,009	432,009		432,009
		SUBTOTAL SYSTEM DEVELOPMENT & DEMONSTRATION	6,925,244	6,194,044	6,881,164	-225,500	6,703,744
		MANAGEMENT SUPPORT					
123	0604256F	THREAT SIMULATOR DEVELOPMENT	59,693	59,693	59,693		59,693
124	0604759F	MAJOR T&E INVESTMENT	181,663	183,663	232,663	38,000	219,663
		Telemetry extension SATCOM relay		[2,000]		[2,000]	
		UPL M-Code Acceleration			[36,000]	[36,000]	
		Utah training range instrumentation			[15,000]		
125	0605101F	RAND PROJECT AIR FORCE	35,258	35,258	35,258		35,258

127	0605712F	INITIAL OPERATIONAL TEST & EVALUATION	13,793	13,793	13,793	13,793	13,793
128	0605807F	TEST AND EVALUATION SUPPORT	717,895	743,395	771,895	717,895	717,895
		Accelerate prototype program			[5,000]		
		Facilitates 5G test and evaluation			[49,000]		
		Overwater range telemetry improvements		[9,500]			
		Program increase		[16,000]			
129	0605826F	ACQ WORKFORCE- GLOBAL POWER	258,667	258,667	258,667	258,667	258,667
130	0605827F	ACQ WORKFORCE- GLOBAL VIG & COMBAT SYS	251,992	226,992	251,992	251,992	251,992
		Program decrease		[-25,000]			
131	0605828F	ACQ WORKFORCE- GLOBAL REACH	149,191	149,191	149,191	149,191	149,191
132	0605829F	ACQ WORKFORCE- CYBER, NETWORK, & BUS SYS	235,360	235,360	235,360	235,360	235,360
133	0605830F	ACQ WORKFORCE- GLOBAL BATTLE MGMT	160,196	144,196	160,196	160,196	160,196
		Program decrease		[-16,000]			
134	0605831F	ACQ WORKFORCE- CAPABILITY INTEGRATION	220,255	198,255	220,255	220,255	220,255
		Program decrease		[-22,000]			
135	0605832F	ACQ WORKFORCE- ADVANCED PRGM TECHNOLOGY	42,392	42,392	42,392	42,392	42,392
136	0605833F	ACQ WORKFORCE- NUCLEAR SYSTEMS	133,231	133,231	133,231	133,231	133,231
137	0605898F	MANAGEMENT HQ—R&D	5,590	5,590	5,590	5,590	5,590
138	0605976F	FACILITIES RESTORATION AND MODERNIZATION—TEST AND EVALUATION SUPPORT.	88,445	88,445	88,445	88,445	88,445
139	0605978F	FACILITIES SUSTAINMENT—TEST AND EVALUATION SUPPORT	29,424	29,424	29,424	29,424	29,424
140	0606017F	REQUIREMENTS ANALYSIS AND MATURATION	62,715	62,715	62,715	62,715	62,715
141	0606398F	MANAGEMENT HQ—T&E	5,013	5,013	5,013	5,013	5,013
142	0308602F	ENTERPRISE INFORMATION SERVICES (EIS)	17,128	17,128	17,128	17,128	17,128
143	0702806F	ACQUISITION AND MANAGEMENT SUPPORT	5,913	5,913	5,913	5,913	5,913
144	0804731F	GENERAL SKILL TRAINING	1,475	1,475	1,475	1,475	1,475
146	1001004F	INTERNATIONAL ACTIVITIES	4,071	4,071	4,071	4,071	4,071
147	1206116F	SPACE TEST AND TRAINING RANGE DEVELOPMENT	19,942	14,942	19,942	19,942	19,942
		Unjustified growth		[-5,000]			
148	1206392F	SPACE AND MISSILE CENTER (SMC) CIVILIAN WORKFORCE	167,810	167,810	167,810	167,810	167,810
149	1206398F	SPACE & MISSILE SYSTEMS CENTER—MHA	10,170	10,170	10,170	10,170	10,170
150	1206860F	ROCKET SYSTEMS LAUNCH PROGRAM (SPACE)	13,192	23,192	13,192	13,192	13,192

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151	1206864F	Small rockets launch services		[10,000]			
		SPACE TEST PROGRAM (STP)	26,097	29,097	26,097		26,097
		Small launch		[3,000]			
		SUBTOTAL MANAGEMENT SUPPORT	2,916,571	2,889,071	3,021,571	38,000	2,954,571
OPERATIONAL SYSTEMS DEVELOPMENT							
UNDISTRIBUTED							
152	0604003F	ADVANCED BATTLE MANAGEMENT SYSTEM (ABMS)	35,611	20,011	84,611	-2,000	33,611
		Accelerates 5G military use			[49,000]		
		Program increase—sensor fusion and artificial intelligence technology.		[10,000]		[8,000]	
		Unjustified request		[-25,600]		[-10,000]	
154	0604233F	SPECIALIZED UNDERGRADUATE FLIGHT TRAINING	2,584	2,584	2,584		2,584
155	0604445F	WIDE AREA SURVEILLANCE		20,000			
		Program increase		[20,000]			
156	0604776F	DEPLOYMENT & DISTRIBUTION ENTERPRISE R&D	903	903	903		903
157	0604840F	F-35 C2D2	694,455	694,455	694,455		694,455
158	0605018F	AF INTEGRATED PERSONNEL AND PAY SYSTEM (AF-IPPS)	40,567	30,567			40,567
		Poor agile development			[-40,567]		
		Program decrease		[-10,000]			
159	0605024F	ANTI-TAMPER TECHNOLOGY EXECUTIVE AGENCY	47,193	47,193	47,193		47,193
160	0605117F	FOREIGN MATERIEL ACQUISITION AND EXPLOITATION	70,083	70,083	70,083		70,083
161	0605278F	HC/MC-130 RECAP RDT&E	17,218	17,218	4,818		17,218
		Program delay			[-12,400]		
162	0606018F	NC3 INTEGRATION	25,917	25,917	25,917		25,917
164	0101113F	B-52 SQUADRONS	325,974	325,974	325,974		325,974
165	0101122F	AIR-LAUNCHED CRUISE MISSILE (ALCM)	10,217	10,217	10,217		10,217

166	0101126F	B-1B SQUADRONS	1,000	1,000	1,000	1,000	1,000
167	0101127F	B-2 SQUADRONS	97,276	97,276	97,276	97,276	97,276
168	0101213F	MINUTEMAN SQUADRONS	128,961	106,939	106,961	106,961	128,961
		Program consolidation		[-22,022]	[-22,000]		
		Technical adjustment for NC3					
170	0101316F	WORLDWIDE JOINT STRATEGIC COMMUNICATIONS	18,177	18,177	18,177	18,177	18,177
171	0101324F	INTEGRATED STRATEGIC PLANNING & ANALYSIS NETWORK	24,261	24,261	24,261	24,261	24,261
172	0101328F	ICBM REENTRY VEHICLES	75,571	75,571	75,571	75,571	41,271
		Program delay				-34,300	
						[-34,300]	
174	0102110F	UH-1H REPLACEMENT PROGRAM	170,975	170,975	170,975	170,975	170,975
176	0205219F	MQ-9 UAV	154,996	154,996	154,996	154,996	127,296
		Program reduction					[-27,700]
178	0207131F	A-10 SQUADRONS	36,816	36,816	36,816	36,816	36,816
179	0207133F	F-16 SQUADRONS	193,013	193,013	193,013	193,013	193,013
180	0207134F	F-15E SQUADRONS	336,079	317,779	336,079	336,079	319,829
		Unjustified F-15C requirements		[-18,300]			
181	0207136F	MANNED DESTRUCTIVE SUPPRESSION	15,521	15,521	15,521	15,521	15,521
182	0207138F	F-22A SQUADRONS	496,298	442,498	496,298	496,298	496,298
		Excess to requirements		[-23,800]			
		Prior-year carryover		[-30,000]			
183	0207142F	F-35 SQUADRONS	99,943	99,943	99,943	99,943	99,943
184	0207161F	TACTICAL AIM MISSILES	10,314	10,314	10,314	10,314	10,314
185	0207163F	ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE (AMRAAM)	55,384	55,384	55,384	55,384	55,384
186	0207227F	COMBAT RESCUE—PARARESCUE	281	281	281	281	281
187	0207247F	AF TENCAP	21,365	21,365	21,365	21,365	21,365
188	0207249F	PRECISION ATTACK SYSTEMS PROCUREMENT	10,696	10,696	10,696	10,696	10,696
189	0207253F	COMPASS CALL	15,888	15,888	15,888	15,888	15,888
190	0207268F	AIRCRAFT ENGINE COMPONENT IMPROVEMENT PROGRAM	112,505	107,505	112,505	112,505	112,505
		Prior-year carryover (F-35)		[-5,000]			
191	0207325F	JOINT AIR-TO-SURFACE STANDOFF MISSILE (JASSM)	78,498	78,498	78,498	78,498	78,498
192	0207410F	AIR & SPACE OPERATIONS CENTER (AOC)	114,864	104,864	114,864	114,864	114,864
		Unjustified request		[-10,000]			

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193	0207412F	CONTROL AND REPORTING CENTER (CRC)	8,109	8,109	8,109		8,109
194	0207417F	AIRBORNE WARNING AND CONTROL SYSTEM (AWACS)	67,996	61,209	67,996		67,996
		Excess to need		[-6,787]			
195	0207418F	TACTICAL AIRBORNE CONTROL SYSTEMS	2,462	2,462	2,462		2,462
197	0207431F	COMBAT AIR INTELLIGENCE SYSTEM ACTIVITIES	13,668	13,668	13,668		13,668
198	0207444F	TACTICAL AIR CONTROL PARTY-MOD	6,217	6,217	6,217		6,217
200	0207452F	DCAPEs	19,910	19,910	19,910		19,910
201	0207575F	NATIONAL TECHNICAL NUCLEAR FORENSICS	1,788	1,788	1,788		1,788
202	0207590F	SEEK EAGLE	28,237	28,237	28,237		28,237
203	0207601F	USAF MODELING AND SIMULATION	15,725	15,725	15,725		15,725
204	0207605F	WARGAMING AND SIMULATION CENTERS	4,316	4,316	4,316		4,316
205	0207610F	BATTLEFIELD ABN COMM NODE (BACN)	26,946	26,946	26,946		26,946
206	0207697F	DISTRIBUTED TRAINING AND EXERCISES	4,303	4,303	4,303		4,303
207	0208006F	MISSION PLANNING SYSTEMS	71,465	71,465	71,465		71,465
208	0208007F	TACTICAL DECEPTION	7,446	7,446	7,446		7,446
209	0208064F	OPERATIONAL HQ—CYBER	7,602	7,602	7,602		7,602
210	0208087F	DISTRIBUTED CYBER WARFARE OPERATIONS	35,178	35,178	35,178		35,178
211	0208088F	AF DEFENSIVE CYBERSPACE OPERATIONS	16,609	16,609	16,609		16,609
212	0208097F	JOINT CYBER COMMAND AND CONTROL (JCC2)	11,603	11,603	11,603		11,603
213	0208099F	UNIFIED PLATFORM (UP)	84,702	84,702	84,702		84,702
218A	0301004F	ADVANCED DATA TRANSPORT FLIGHT TEST			21,000		
		Accelerate prototype test of 5G			[21,000]		
219	0301025F	GEORBASE	2,723	2,723	2,723		2,723
220	0301112F	NUCLEAR PLANNING AND EXECUTION SYSTEM (NPES)	44,190	44,190	44,190		44,190
226	0301401F	AIR FORCE SPACE AND CYBER NON-TRADITIONAL ISR FOR BATTLESPACE AWARENESS	3,575	3,575	3,575		3,575
227	0302015F	E-4B NATIONAL AIRBORNE OPERATIONS CENTER (NAOC)	70,173	70,173	70,173	-27,550	42,623

228	0303131F	Unclear acquisition strategy MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK (MEECN) Advanced concept development—NC3 demonstration and evaluation.	13,543	28,543 [15,000]	13,543	[−27,550]	13,543
229	0303133F	HIGH FREQUENCY RADIO SYSTEMS Prior-year carryover	15,881	1,881 [−14,000]	15,881		15,881
230	0303140F	INFORMATION SYSTEMS SECURITY PROGRAM	27,726	27,726	27,726		27,726
232	0303142F	GLOBAL FORCE MANAGEMENT—DATA INITIATIVE	2,210	2,210	2,210		2,210
234	0304115F	MULTI DOMAIN COMMAND AND CONTROL (MDC2) Unjustified growth	150,880	100,880 [−50,000]	150,880		150,880
235	0304260F	AIRBORNE SIGINT ENTERPRISE Common development ahead of need Program reduction	102,667	94,167 [−8,500]	102,667	−17,500 [−8,500]	85,167
236	0304310F	COMMERCIAL ECONOMIC ANALYSIS	3,431	3,431	3,431		3,431
239	0305015F	C2 AIR OPERATIONS SUITE—C2 INFO SERVICES	9,313	9,313	9,313		9,313
240	0305020F	CCMD INTELLIGENCE INFORMATION TECHNOLOGY	1,121	1,121	1,121		1,121
241	0305022F	ISR MODERNIZATION & AUTOMATION DVMT (IMAD) Not mature plan	19,000	3,000	[−19,000]	−16,000	3,000
242	0305099F	GLOBAL AIR TRAFFIC MANAGEMENT (GATM) Unjustified request	4,544	[−16,000]	4,544	[−16,000]	4,544
243	0305111F	WEATHER SERVICE Commercial weather data pilot	25,461	4,544 27,461	25,461	2,000 [2,000]	27,461
244	0305114F	AIR TRAFFIC CONTROL, APPROACH, AND LANDING SYSTEM (ATCAL)	5,651	5,651	5,651		5,651
245	0305116F	AERIAL TARGETS	7,448	7,448	7,448		7,448
248	0305128F	SECURITY AND INVESTIGATIVE ACTIVITIES	425	425	425		425
249	0305145F	ARMS CONTROL IMPLEMENTATION	54,546	54,546	54,546		54,546
250	0305146F	DEFENSE JOINT COUNTERINTELLIGENCE ACTIVITIES	6,858	6,858	6,858		6,858
252	0305179F	INTEGRATED BROADCAST SERVICE (IBS)	8,728	8,728	8,728		8,728
253	0305202F	DRAGON U-2	38,939	38,939	38,939		38,939
255	0305206F	AIRBORNE RECONNAISSANCE SYSTEMS Program increase for Gorgon Stare sensor enhancements	122,909	132,909 [10,000]	122,909	10,000 [10,000]	132,909
256	0305207F	MANNED RECONNAISSANCE SYSTEMS	11,787	11,787	11,787		11,787

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257	0305208F	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	25,009	25,009	25,009		25,009
258	0305220F	RQ-4 UAV	191,733	173,883	191,733		191,733
		Unjustified request		[-17,850]			
259	0305221F	NETWORK-CENTRIC COLLABORATIVE TARGETING	10,757	10,757	10,757		10,757
260	0305238F	NATO AGS	32,567	32,567	32,567		32,567
261	0305240F	SUPPORT TO DCGS ENTERPRISE	37,774	37,774	37,774		37,774
262	0305600F	INTERNATIONAL INTELLIGENCE TECHNOLOGY AND ARCHITECTURES	13,515	13,515	13,515		13,515
263	0305881F	RAPID CYBER ACQUISITION	4,383	4,383	4,383		4,383
264	0305984F	PERSONNEL RECOVERY COMMAND & CTRL (PRC2)	2,133	2,133	2,133		2,133
265	0307577F	INTELLIGENCE MISSION DATA (IMD)	8,614	8,614	8,614		8,614
266	0401115F	C-130 AIRLIFT SQUADRON	140,425	140,425	140,425		101,425
		Contract award savings				-39,000	
						[-39,000]	
267	0401119F	C-5 AIRLIFT SQUADRONS (IF)	10,223	10,223	10,223		10,223
268	0401130F	C-17 AIRCRAFT (IF)	25,101	25,101	25,101		25,101
269	0401132F	C-130J PROGRAM	8,640	8,640	8,640		8,640
270	0401134F	LARGE AIRCRAFT IR COUNTERMEASURES (LAIRCW)	5,424	5,424	5,424		5,424
272	0401219F	KC-10S	20	20	20		20
274	0401318F	CV-22	17,906	17,906	17,906		17,906
276	0408011F	SPECIAL TACTICS / COMBAT CONTROL	3,629	3,629	3,629		3,629
277	0702207F	DEPOT MAINTENANCE (NON-IF)	1,890	1,890	1,890		1,890
278	0708055F	MAINTENANCE, REPAIR & OVERHAUL SYSTEM	10,311	10,311	10,311		10,311
279	0708610F	LOGISTICS INFORMATION TECHNOLOGY (LOGIT)	16,065	16,065	16,065		16,065
280	0708611F	SUPPORT SYSTEMS DEVELOPMENT	539	539	539		539
281	0804743F	OTHER FLIGHT TRAINING	2,057	2,057	2,057		2,057
282	080716F	OTHER PERSONNEL ACTIVITIES	10	10	10		10
283	0901202F	JOINT PERSONNEL RECOVERY AGENCY	2,060	2,060	2,060		2,060
284	0901218F	CIVILIAN COMPENSATION PROGRAM	3,809	3,809	3,809		3,809

285	0901220F	PERSONNEL ADMINISTRATION	6,476	6,476	6,476	6,476	
286	0901226F	AIR FORCE STUDIES AND ANALYSIS AGENCY	1,443	1,443	1,443	1,443	
287	0901538F	FINANCIAL MANAGEMENT INFORMATION SYSTEMS DEVELOPMENT	9,323	9,323	9,323	9,323	
288	0901554F	DEFENSE ENTERPRISE ACING AND MGT SYS (DEAMS)	46,789	46,789	46,789	46,789	
289	1201017F	GLOBAL SENSOR INTEGRATED ON NETWORK (GSIN)	3,647	3,647	3,647	3,647	
290	1201921F	SERVICE SUPPORT TO STRATCOM—SPACE ACTIVITIES	988	988	988	988	
291	1202140F	SERVICE SUPPORT TO SPACECOM ACTIVITIES	11,863	11,863	11,863	11,863	
293	1203001F	FAMILY OF ADVANCED BLOS TERMINALS (FAB-T)	197,388	197,388	197,388	197,388	
		FET schedule slip					-20,000
		Unjustified growth					[-15,000]
294	1203110F	SATELLITE CONTROL NETWORK (SPACE)	61,891	61,891	61,891	61,891	[-5,000]
297	1203173F	SPACE AND MISSILE TEST AND EVALUATION CENTER	4,566	4,566	4,566	4,566	
298	1203174F	SPACE INNOVATION, INTEGRATION AND RAPID TECHNOLOGY DEVELOPMENT	43,292	43,292	43,292	43,292	
300	1203182F	SPACELIFT RANGE SYSTEM (SPACE)	10,837	10,837	10,837	10,837	
301	1203265F	GPS III SPACE SEGMENT	42,440	42,440	42,440	42,440	
302	1203400F	SPACE SUPERIORITY INTELLIGENCE	14,428	14,428	14,428	14,428	
303	1203614F	JSPOC MISSION SYSTEM	72,762	51,262	72,762	72,762	
		Unjustified growth					[-21,500]
304	1203620F	NATIONAL SPACE DEFENSE CENTER	2,653	2,653	2,653	2,653	
306	1203873F	BALLISTIC MISSILE DEFENSE RADARS	15,881	15,881	15,881	15,881	
308	1203913F	NUDET DETECTION SYSTEM (SPACE)	49,300	49,300	49,300	49,300	
309	1203940F	SPACE SITUATION AWARENESS OPERATIONS	17,834	17,834	17,834	17,834	
310	1206423F	GLOBAL POSITIONING SYSTEM III—OPERATIONAL CONTROL SEGMENT	445,302	445,302	445,302	445,302	
311	1206770F	ENTERPRISE GROUND SERVICES	138,870	128,670	138,870	138,870	
		Contract award delay					-39,800
		Unjustified growth					[-39,800]
311A	9999999999	CLASSIFIED PROGRAMS	18,351,506	17,998,506	18,351,506	18,351,506	
		Classified reduction					[-122,000]
		SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT	24,851,488	24,253,329	24,827,521	24,501,388	
		SUBTOTAL UNDISTRIBUTED		-598,159	-23,967	-350,100	

SEC. 4201. RESEARCH, DEVELOPMENT, TEST AND EVALUATION
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Line	Program Element	Item	FY 2020 Request	House Authorized	Senate Authorized	Conference Change	Conference Authorized
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, AF	45,938,122	44,048,785	46,335,775	-353,378	45,584,744
		RESEARCH, DEVELOPMENT, TEST & EVAL, DW					
		BASIC RESEARCH					
001	0601000BR	DTRA BASIC RESEARCH	26,000	26,000	26,000		26,000
002	0601101E	DEFENSE RESEARCH SCIENCES	432,284	432,284	432,284		432,284
003	0601110D8Z	BASIC RESEARCH INITIATIVES DEPSCOR	48,874	58,874	58,874	20,000	68,874
		Program increase		[10,000]	[10,000]	[10,000]	
004	0601117E	BASIC OPERATIONAL MEDICAL RESEARCH SCIENCE	54,122	59,122	54,122		54,122
		Brain injury research university partnerships		[5,000]			
005	0601120D8Z	NATIONAL DEFENSE EDUCATION PROGRAM	92,074	112,074	102,074	10,000	102,074
		Civics education grant program		[20,000]		[2,000]	
		Submarine industrial base workforce training and education				[8,000]	
006	0601228D8Z	HISTORICALLY BLACK COLLEGES AND UNIVERSITIES/MINORITY INSTITUTIONS.	30,708	50,708	32,708	16,000	46,708
		Aerospace research and education				[2,000]	
		Program decrease		[-5,000]			
		Program increase		[25,000]		[14,000]	
007	0601384BP	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM	45,238	45,238	45,238		45,238
		SUBTOTAL BASIC RESEARCH	729,300	784,300	751,300	46,000	775,300
		APPLIED RESEARCH					
008	0602000D8Z	JOINT MUNITIONS TECHNOLOGY	19,306	19,306	19,306		19,306
009	0602115E	BIOMEDICAL TECHNOLOGY	97,771	97,771	97,771		97,771
011	0602234D8Z	LINCOLN LABORATORY RESEARCH PROGRAM	52,317	52,317	52,317		52,317

012	0602251D8Z	APPLIED RESEARCH FOR THE ADVANCEMENT OF S&T PRIORITIES	62,200	62,200	64,200	-6,800	55,400
		Computer modeling of PFAS			[2,000]	[2,000]	
		Excess growth			[-8,800]	[-8,800]	
013	0602303E	INFORMATION & COMMUNICATIONS TECHNOLOGY	442,556	442,556	442,556	[-5,000]	437,556
		Unjustified growth					
014	0602383E	BIOLOGICAL WARFARE DEFENSE	34,588	34,588	34,588		34,588
015	0602384BP	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM	202,587	[12,500]	202,587	12,500	215,087
		Program increase				[12,500]	
016	0602668D8Z	CYBER SECURITY RESEARCH	15,118	15,118	25,118	10,000	25,118
		Academic cyber institutes			[10,000]	[10,000]	
017	0602702E	TACTICAL TECHNOLOGY	337,602	337,602	337,602		337,602
018	0602715E	MATERIALS AND BIOLOGICAL TECHNOLOGY	223,976	223,976	223,976		223,976
019	0602716E	ELECTRONICS TECHNOLOGY	332,192	332,192	332,192	-6,000	326,192
		Unjustified growth				[-6,000]	
020	06027188R	COUNTER WEAPONS OF MASS DESTRUCTION APPLIED RESEARCH	179,096	179,096	179,096	-5,000	174,096
		Unjustified growth				[-5,000]	
021	0602751D8Z	SOFTWARE ENGINEERING INSTITUTE (SEI) APPLIED RESEARCH	9,580	9,580	9,580		9,580
022	1160401BB	SOF TECHNOLOGY DEVELOPMENT	40,569	45,569	40,569		40,569
		Media forensics		[5,000]			
		SUBTOTAL APPLIED RESEARCH	2,049,458	2,066,958	2,061,458	-300	2,049,158
ADVANCED TECHNOLOGY DEVELOPMENT							
023	0603000D8Z	JOINT MUNITIONS ADVANCED TECHNOLOGY	25,779	25,779	25,779		25,779
024	0603121D8Z	SO/LIC ADVANCED DEVELOPMENT	5,000	5,000	5,000		5,000
025	0603122D8Z	COMBATING TERRORISM TECHNOLOGY SUPPORT	70,517	79,517	70,517	5,000	75,517
		Counterterrorism detection technologies		[3,000]			
		Program increase				[5,000]	
		Terrorism studies		[6,000]			
026	0603133D8Z	FOREIGN COMPARATIVE TESTING	24,970	24,970	24,970		24,970
028	0603160BR	COUNTER WEAPONS OF MASS DESTRUCTION ADVANCED TECHNOLOGY DEVELOPMENT	340,065	340,065	340,065	-1,490	338,575
		Excess growth				[-1,490]	

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029	0603176C	ADVANCED CONCEPTS AND PERFORMANCE ASSESSMENT	14,208	14,208	14,208		14,208
030	0603178C	WEAPONS TECHNOLOGY	10,000	10,000	10,000	-10,000	
		MD72 program termination				[-10,000]	
031	0603180C	ADVANCED RESEARCH	20,674	27,674	20,674	7,000	27,674
		Advanced carbon-carbon composites manufacturing		[7,000]		[7,000]	
032	0603225D8Z	JOINT DOD-DOE MUNITIONS TECHNOLOGY DEVELOPMENT	18,773	18,773	18,773		18,773
033	0603286E	ADVANCED AEROSPACE SYSTEMS	279,741	279,741	279,741		279,741
034	0603287E	SPACE PROGRAMS AND TECHNOLOGY	202,606	202,606	202,606	-30,000	172,606
		RSGS program delays				[-30,000]	
035	0603288D8Z	ANALYTIC ASSESSMENTS	19,429	19,429	19,429		19,429
036	0603289D8Z	ADVANCED INNOVATIVE ANALYSIS AND CONCEPTS	37,645	37,645	37,645		37,645
037	0603291D8Z	ADVANCED INNOVATIVE ANALYSIS AND CONCEPTS—MHA	14,668	14,668	14,668		14,668
038	0603294C	COMMON KILL VEHICLE TECHNOLOGY	13,600	13,600	13,600		13,600
040	0603342D8Z	DEFENSE INNOVATION UNIT (DIU)	29,398	29,398	36,898		29,398
		Accelerate artificial intelligence solutions			[7,500]		
041	0603375D8Z	TECHNOLOGY INNOVATION	60,000	44,000	60,000	-30,000	30,000
		Insufficient justification				[-30,000]	
		Program decrease		[-16,000]			
042	0603384BP	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM—ADVANCED DEVELOPMENT	172,486	172,486	172,486		172,486
043	0603527D8Z	RETRACT LARCH	159,688	159,688	159,688		159,688
044	0603618D8Z	JOINT ELECTRONIC ADVANCED TECHNOLOGY	12,063	17,063	12,063		12,063
		Joint electromagnetic spectrum operations		[5,000]			
045	0603648D8Z	JOINT CAPABILITY TECHNOLOGY DEMONSTRATIONS	107,359	107,359	89,859	-17,500	89,859
		Program reduction			[-17,500]		
046	0603662D8Z	NETWORKED COMMUNICATIONS CAPABILITIES	2,858	2,858	2,858		2,858
047	0603680D8Z	DEFENSE-WIDE MANUFACTURING SCIENCE AND TECHNOLOGY PROGRAM	96,397	116,397	96,397	20,000	116,397

048	0603680S	Additive manufacturing	[10,000]	[10,000]	
049	0603699D8Z	Integrated silicon based lasers	[5,000]	[5,000]	
		Program increase	[5,000]	[5,000]	
		MANUFACTURING TECHNOLOGY PROGRAM	42,834	42,834	42,834
		EMERGING CAPABILITIES TECHNOLOGY DEVELOPMENT	80,911	70,911	80,911
		Program reduction	[-10,000]		
050	0603712S	GENERIC LOGISTICS R&D TECHNOLOGY DEMONSTRATIONS	10,817	10,817	10,817
051	0603716D8Z	STRATEGIC ENVIRONMENTAL RESEARCH PROGRAM	66,157	76,157	66,157
		SERDP	[10,000]		
052	0603720S	MICROELECTRONICS TECHNOLOGY DEVELOPMENT AND SUPPORT	171,771	171,771	171,771
053	0603727D8Z	JOINT WARFIGHTING PROGRAM	4,846	4,846	4,846
054	0603739E	ADVANCED ELECTRONICS TECHNOLOGIES	128,616	128,616	128,616
055	0603760E	COMMAND, CONTROL AND COMMUNICATIONS SYSTEMS	232,134	232,134	232,134
056	0603766E	NETWORK-CENTRIC WARFARE TECHNOLOGY	512,424	512,424	507,424
		Unjustified increase			-5,000
					[-5,000]
057	0603767E	SENSOR TECHNOLOGY	163,903	163,903	163,903
058	0603769D8Z	DISTRIBUTED LEARNING ADVANCED TECHNOLOGY DEVELOPMENT	13,723	13,723	13,723
059	0603781D8Z	SOFTWARE ENGINEERING INSTITUTE	15,111	15,111	15,111
060	0603826D8Z	QUICK REACTION SPECIAL PROJECTS	47,147	47,147	47,147
061	0603833D8Z	ENGINEERING SCIENCE & TECHNOLOGY	19,376	19,376	19,376
062	0603924D8Z	HIGH ENERGY LASER ADVANCED TECHNOLOGY PROGRAM	85,223	85,223	85,223
063	0603941D8Z	TEST & EVALUATION SCIENCE & TECHNOLOGY	175,574	185,574	185,574
		Program increase to support NDS technologies			10,000
		UAV hypersonic test range	[5,000]		
064	0603950D8Z	NATIONAL SECURITY INNOVATION NETWORK	25,000	25,000	25,000
		Hacking for defense	[5,000]		
065	0604055D8Z	OPERATIONAL ENERGY CAPABILITY IMPROVEMENT	70,536	70,536	53,900
		Excess growth			[-16,636]
066	0303100D8Z	CWMD SYSTEMS	28,907	28,907	28,907
068	11604028B	SOF ADVANCED TECHNOLOGY DEVELOPMENT	89,154	89,154	89,154
069	1206310SDA	SPACE SCIENCE AND TECHNOLOGY RESEARCH AND DEVELOPMENT	20,000	20,000	20,000

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Line	Program Element	Item	FY 2020 Request	House Authorized	Senate Authorized	Conference Change	Conference Authorized
		Program increase for commercial SSA; funds transferred from JSPOC Mission System. [21,500]					
		SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT	3,742,088	3,798,588	3,742,088	-68,626	3,673,462
		ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES					
070	0603161D8Z	NUCLEAR AND CONVENTIONAL PHYSICAL SECURITY EQUIPMENT RD&E ADC&P.	42,695	42,695	42,695		42,695
071	0603600D8Z	WALKOFF	92,791	92,791	92,791		92,791
072	0603821D8Z	ACQUISITION ENTERPRISE DATA & INFORMATION SERVICES	5,659	5,659	5,659		5,659
073	0603851D8Z	ENVIRONMENTAL SECURITY TECHNICAL CERTIFICATION PROGRAM	66,572	66,572	76,572	2,000	68,572
		ESTCP			[10,000]	[2,000]	
074	0603881C	BALLISTIC MISSILE DEFENSE TERMINAL DEFENSE SEGMENT	302,761	302,761	302,761		302,761
075	0603882C	BALLISTIC MISSILE DEFENSE MIDCOURSE DEFENSE SEGMENT	1,156,506	960,506	1,156,506	81,100	1,237,606
		Common booster engineering early to need				[-15,000]	
		GBSD booster engineering					
		Homeland Defense Radar-Hawaii delay				[-30,400]	
		RKV cancellation—on demand communications				[-13,500]	
		RKV Program Termination—Trasfer from RD,DW 109 for SLEP program.				[140,000]	
		Unjustified program growth					
076	0603884BP	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM—DEM/VAL	83,662	83,662	83,662		83,662
077	0603884C	BALLISTIC MISSILE DEFENSE SENSORS	283,487	283,487	283,487		283,487
078	0603890C	BMD ENABLING PROGRAMS	571,507	570,476	571,507		571,507
		Rescope FTM-44—Conduct IRBM test					
079	0603891C	SPECIAL PROGRAMS—MDA	377,098	504,098	502,098	135,000	512,098
		Classified					
		Classified reduction				[-8,000]	

080	0603892C	Classified unfunded priority		[135,000]					
		AEIS BMD	727,479	702,479	727,479	727,479	699,479		
		Unjustified cost growth		[-25,000]					
		Unjustified growth							
081	0603896C	BALLISTIC MISSILE DEFENSE COMMAND AND CONTROL, BATTLE MAN- AGEMENT AND COMMUNICATI.	564,206	561,706	564,206	564,206	562,706		
		IBCS integration delays		[-1,500]					
		Rescope FTM-44—Conduct IRBM test		[-1,000]					
082	0603898C	BALLISTIC MISSILE DEFENSE JOINT WARRIGHTER SUPPORT	51,532	51,532	51,532	51,532	51,532		
083	0603904C	MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MIDIOC)	56,161	56,161	56,161	56,161	56,161		
084	0603906C	REGARDING TRENCH	22,424	22,424	22,424	22,424	22,424		
085	0603907C	SEA BASED X-BAND RADAR (SBX)	128,156	128,156	128,156	128,156	128,156		
086	0603913C	ISRAELI COOPERATIVE PROGRAMS	300,000	300,000	300,000	300,000	300,000		
087	0603914C	BALLISTIC MISSILE DEFENSE TEST	393,924	393,356	393,924	393,924	393,924		
		Rescope FTM-44—Conduct IRBM test		[-2,568]					
088	0603915C	BALLISTIC MISSILE DEFENSE TARGETS	554,171	554,171	554,171	554,171	554,171		
089	0603920D8Z	HUMANITARIAN DEMINING	10,820	15,820	10,820	10,820	14,700		
		Program increase		[5,000]					
090	0603923D8Z	COALITION WARFARE	11,316	11,316	11,316	11,316	11,316		
091	0604016D8Z	DEPARTMENT OF DEFENSE CORROSION PROGRAM	3,365	3,365	3,365	3,365	3,365		
092	0604115C	TECHNOLOGY MATURATION INITIATIVES	303,458	301,122	269,458	269,458	269,458		
		Cancel Neutral Particle Beam		[-34,000]					
		Increase to low power laser demonstrator		[35,000]					
		Neutral particle beam							
		Rescope FTM-44—Conduct IRBM test		[-3,336]					
093	0604132D8Z	MISSILE DEFEAT PROJECT	17,816	7,816	17,816	17,816	10,000		
		Unjustified budget request—program transitioned to services		[-10,000]					
095	0604181C	HYPERSONIC DEFENSE	157,425	157,425	157,425	157,425	157,425		
096	0604250D8Z	ADVANCED INNOVATIVE TECHNOLOGIES	1,312,735	1,007,585	1,343,735	1,343,735	1,312,735		
		Hypervelocity Gun Weapon System							
		Insufficient justification							
		Program decrease		[-155,150]					

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		Realign to 0604011D8Z, Next Generation Information Technology ..		[-50,000]			
		Undistributed		[-100,000]			
		Unjustified growth to SCO			[-50,000]		
097	0604294D8Z	TRUSTED & ASSURED MICROELECTRONICS	542,421	542,421	547,421	5,000	547,421
		Trusted and assured microelectronics research			[5,000]		
098	0604331D8Z	RAPID PROTOTYPING PROGRAM	100,957	100,957	50,957	-50,000	50,957
		Uncoordinated prototyping efforts			[-50,000]		
099	0604341D8Z	DEFENSE INNOVATION UNIT (DIU) PROTOTYPING	92,000	92,000	92,000		92,000
		Insufficient budget justification for national security innovation capital.		[-75,000]			
		Program increase—national security innovation capital		[75,000]			
100	0604400D8Z	DEPARTMENT OF DEFENSE (DOD) UNMANNED SYSTEM COMMON DEVELOPMENT.	3,021	3,021	3,021		3,021
102	0604672C	HOMELAND DEFENSE RADAR—HAWAII (HDR-H)	274,714	274,714	274,714	-101,116	173,598
		Funding acceleration early to need				[-60,000]	
		Radar foundation and thermal control system early to need				[-41,116]	
103	0604673C	PACIFIC DISCRIMINATING RADAR	6,711	6,711	6,711		6,711
104	0604682D8Z	WARGAMING AND SUPPORT FOR STRATEGIC ANALYSIS (SSA)	3,751	3,751	3,751		3,751
105	0604775BR	DEFENSE RAPID INNOVATION PROGRAM	14,021	14,021	14,021		14,021
107	0604826J	JOINT C5 CAPABILITY DEVELOPMENT, INTEGRATION AND INTEROPERABILITY ASSESSMENTS.	20,062	20,062	20,062		20,062
108	0604873C	LONG RANGE DISCRIMINATION RADAR (LRDR)	136,423	136,423	136,423		136,423
109	0604874C	IMPROVED HOMELAND DEFENSE INTERCEPTORS	412,363	262,363	412,363	-140,000	272,363
		Program delays		[-150,000]			
		RKV Termination – transfer to RD,DW 075 for SLEP program				[-140,000]	
110	0604876C	BALLISTIC MISSILE DEFENSE TERMINAL DEFENSE SEGMENT TEST	25,137	25,137	25,137		25,137
111	0604879C	AEGIS BMD TEST	169,822	148,740	169,822		169,822

112	0604879C	Rescope FTM-44—Conduct IRBM test	105,530	[–21,082]	105,530	105,530	105,530
		BALLISTIC MISSILE DEFENSE SENSOR TEST		94,566			
		Rescope FTM-44—Conduct IRBM test		[–10,964]			
113	0604880C	LAND-BASED SM-3 (LBSM3)	38,352	38,352	38,352	38,352	38,352
115	0604887C	BALLISTIC MISSILE DEFENSE MIDCOURSE SEGMENT TEST	98,139	96,446	98,139	98,139	98,139
		Rescope FTM-44—Conduct IRBM test		[–1,693]			
117	0300206R	ENTERPRISE INFORMATION TECHNOLOGY SYSTEMS	1,600	1,600	1,600	1,600	1,600
118	0303191D8Z	JOINT ELECTROMAGNETIC TECHNOLOGY (JET) PROGRAM	3,191	3,191	3,191	3,191	3,191
119	0305103C	CYBER SECURITY INITIATIVE	1,138	1,138	1,138	1,138	1,138
120	1206410SDA	SPACE TECHNOLOGY DEVELOPMENT AND PROTOTYPING	85,000	75,000	55,000	–30,000	55,000
		Increase to SDA for multi-GNSS receiver capability development ...		[20,000]			
		Missile defense studies realignment					
		Space-based discrimination study		[–15,000]			
		Space-based interceptor study		[–15,000]			
121	1206893C	SPACE TRACKING & SURVEILLANCE SYSTEM	35,849	35,849	35,849	35,849	35,849
122	1206895C	BALLISTIC MISSILE DEFENSE SYSTEM SPACE PROGRAMS	27,565	135,565	135,565	108,000	135,565
		HBTS unfunded requirement		[108,000]			
122A	0604011D8Z	Hypersonic and Ballistic Tracking Space Sensor		[108,000]			
		NEXT GENERATION INFORMATION COMMUNICATIONS TECHNOLOGY (5G) ..		175,000		275,000	275,000
		DOD Spectrum Sharing Program				[25,000]	
		NTR and additional AF installation 5G network					
		Program increase		[175,000]			
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES	9,797,493	9,474,169	9,987,493	217,548	10,015,041
		SYSTEM DEVELOPMENT AND DEMONSTRATION					
123	0604161D8Z	NUCLEAR AND CONVENTIONAL PHYSICAL SECURITY EQUIPMENT RDT&E	11,276	11,276	11,276	11,276	11,276
		SDD					
124	0604165D8Z	PROMPT GLOBAL STRIKE CAPABILITY DEVELOPMENT	107,000	[–76,000]	107,000	–31,000	76,000
		Lack of justification—awaiting policy		[–31,000]			
		Transfer to RDTE, Army Line 100		384,047			
125	0604384BP	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM—EMD	384,047	384,047	384,047	–10,000	374,047
		Excess growth				[–10,000]	

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126	0604771D8Z	JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM (JTIDS)	40,102	43,102	40,102		40,102
		Cyber maturity model certification program		[3,000]			
127	0605000BR	COUNTER WEAPONS OF MASS DESTRUCTION SYSTEMS DEVELOPMENT	13,100	13,100	13,100		13,100
128	0605013BL	INFORMATION TECHNOLOGY DEVELOPMENT	3,070	3,070	3,070		3,070
129	0605021SE	HOMELAND PERSONNEL SECURITY INITIATIVE	7,295	7,295	7,295		7,295
130	0605022D8Z	DEFENSE EXPORTABILITY PROGRAM	17,615	7,615	17,615		17,615
		Unjustified growth		[-10,000]			
131	0605027D8Z	OUS(D/C) IT DEVELOPMENT INITIATIVES	15,653	15,653	15,653		15,653
132	0605070S	DOD ENTERPRISE SYSTEMS DEVELOPMENT AND DEMONSTRATION	2,378	2,378	2,378		2,378
133	0605075D8Z	ODM POLICY AND INTEGRATION	1,618	1,618	1,618		1,618
134	0605080S	DEFENSE AGENCY INITIATIVES (DAI)—FINANCIAL SYSTEM	27,944	27,944	27,944		27,944
135	0605090S	DEFENSE RETIRED AND ANNUITANT PAY SYSTEM (DRAS)	6,609	6,609	6,609		6,609
136	0605210D8Z	DEFENSE-WIDE ELECTRONIC PROCUREMENT CAPABILITIES	9,619	9,619	9,619		9,619
137	0605294D8Z	TRUSTED & ASSURED MICROELECTRONICS	175,032	175,032	175,032		175,032
138	0303140BL	INFORMATION SYSTEMS SECURITY PROGRAM	425	425	425		425
139	0303141K	GLOBAL COMBAT SUPPORT SYSTEM	1,578	1,578	1,578		1,578
140	0305304D8Z	DOD ENTERPRISE ENERGY INFORMATION MANAGEMENT (EEM)	4,373	4,373	4,373		4,373
141	0305310D8Z	ODM SYSTEMS: SYSTEM DEVELOPMENT AND DEMONSTRATION	12,854	12,854	12,854		12,854
		SUBTOTAL SYSTEM DEVELOPMENT AND DEMONSTRATION	841,588	727,588	841,588	-41,000	800,588
MANAGEMENT SUPPORT							
142	0603829J	JOINT CAPABILITY EXPERIMENTATION	13,000	13,000	13,000		13,000
143	0604774D8Z	DEFENSE READINESS REPORTING SYSTEM (DRRS)	9,724	9,724	9,724		9,724
144	0604875D8Z	JOINT SYSTEMS ARCHITECTURE DEVELOPMENT	9,593	9,593	9,593		9,593
145	0604940D8Z	CENTRAL TEST AND EVALUATION INVESTMENT DEVELOPMENT (CTEIP)	260,267	240,267	260,267		260,267
		Undistributed		[-20,000]			
146	0604942D8Z	ASSESSMENTS AND EVALUATIONS	30,834	30,834	30,834		30,834

147	0605001E	MISSION SUPPORT	68,498	68,498	68,498	68,498	68,498
148	0605100D8Z	JOINT MISSION ENVIRONMENT TEST CAPABILITY (JMTEC)	83,091	83,091	89,091	89,091	89,091
		Cyber range development			[6,000]	[6,000]	
149	0605104D8Z	TECHNICAL STUDIES, SUPPORT AND ANALYSIS	18,079	18,079	13,079	18,079	18,079
		Program reduction			[-5,000]		
150	0605126I	JOINT INTEGRATED AIR AND MISSILE DEFENSE ORGANIZATION (JIAMDO)	70,038	70,038	70,038	70,038	70,038
152	0605142D8Z	SYSTEMS ENGINEERING	37,140	37,140	32,140	37,140	37,140
		Program reduction			[-5,000]		
153	0605151D8Z	STUDIES AND ANALYSIS SUPPORT—OSD	4,759	4,759	4,759	4,759	4,759
154	0605161D8Z	NUCLEAR MATTERS—PHYSICAL SECURITY	8,307	8,307	8,307	8,307	8,307
155	0605170D8Z	SUPPORT TO NETWORKS AND INFORMATION INTEGRATION	9,441	9,441	9,441	9,441	9,441
156	0605200D8Z	GENERAL SUPPORT TO USD (INTELLIGENCE)	1,700	1,700	1,700	1,700	1,700
157	0605384BP	CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM	110,363	110,363	110,363	110,363	110,363
166	0605790D8Z	SMALL BUSINESS INNOVATION RESEARCH (SBIR)/ SMALL BUSINESS TECHNOLOGY TRANSFER	3,568	3,568	3,568	3,568	3,568
167	0605797D8Z	MAINTAINING TECHNOLOGY ADVANTAGE	19,936	19,936	19,936	19,936	19,936
168	0605798D8Z	DEFENSE TECHNOLOGY ANALYSIS	16,875	19,875	16,875	19,875	19,875
		National Science, Technology, and Security Roundtable with Academia		[3,000]			
169	0605801KA	DEFENSE TECHNICAL INFORMATION CENTER (DTIC)	57,716	57,716	57,716	57,716	57,716
170	0605803SE	R&D IN SUPPORT OF DOD ENLISTMENT, TESTING AND EVALUATION	34,448	34,448	34,448	34,448	34,448
171	0605804D8Z	DEVELOPMENT TEST AND EVALUATION	22,203	22,203	22,203	22,203	22,203
172	0605898E	MANAGEMENT HQ—R&D	13,208	13,208	13,208	13,208	13,208
173	0605998KA	MANAGEMENT HQ—DEFENSE TECHNICAL INFORMATION CENTER (DTIC)	3,027	3,027	3,027	3,027	3,027
174	0606100D8Z	BUDGET AND PROGRAM ASSESSMENTS	8,017	8,017	8,017	8,017	8,017
175	0606225D8Z	ODNA TECHNOLOGY AND RESOURCE ANALYSIS	3,194	3,194	3,194	3,194	3,194
176	0606589D8W	DEFENSE DIGITAL SERVICE (DDS) DEVELOPMENT SUPPORT	1,000	1,000	6,000	1,000	1,000
		Increase			[5,000]		
179	0203345D8Z	DEFENSE OPERATIONS SECURITY INITIATIVE (DOSI)	3,037	3,037	3,037	3,037	3,037
180	0204571J	JOINT STAFF ANALYTICAL SUPPORT	9,216	9,216	9,216	9,216	9,216
183	0303166I	SUPPORT TO INFORMATION OPERATIONS (IO) CAPABILITIES	553	553	553	553	553
184	0303260D8Z	DEFENSE MILITARY DECEPTION PROGRAM OFFICE (DMDPO)	1,014	1,014	1,014	1,014	1,014

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2020 Request	House Authorized	Senate Authorized	Conference Change	Conference Authorized
185	0305172K	COMBINED ADVANCED APPLICATIONS	58,667	58,667	58,667	-10,000	48,667
		Unjustified growth				[-10,000]	
187	030524508Z	INTELLIGENCE CAPABILITIES AND INNOVATION INVESTMENTS	21,081	21,081	21,081		21,081
189	030758808Z	ALGORITHMIC WARFARE CROSS FUNCTIONAL TEAMS	221,235	221,235	221,235		221,235
191	0804768J	COCOM EXERCISE ENGAGEMENT AND TRAINING TRANSFORMATION (GE2T2)—NON-MHA	40,073	40,073	40,073		40,073
192	0808709SE	DEFENSE EQUAL OPPORTUNITY MANAGEMENT INSTITUTE (DEOMI)	100	100	100		100
193	0901598C	MANAGEMENT HQ—MDA	27,065	27,065	27,065		27,065
194	0903235K	JOINT SERVICE PROVIDER (JSP)	3,090	3,090	3,090		3,090
194A	99999999999	CLASSIFIED PROGRAMS	51,471	51,471	51,471		51,471
		SUBTOTAL MANAGEMENT SUPPORT	1,354,628	1,337,628	1,355,628	-1,000	1,353,628
		OPERATIONAL SYSTEM DEVELOPMENT					
		UNDISTRIBUTED					
195	0604130V	ENTERPRISE SECURITY SYSTEM (ESS)	7,945	7,945	7,945		7,945
196	0604532K	JOINT ARTIFICIAL INTELLIGENCE	208,834	166,834	208,834		208,834
		Early to need		[-42,000]			
197	0605127T	REGIONAL INTERNATIONAL OUTREACH (RIO) AND PARTNERSHIP FOR PEACE INFORMATION MANA	1,947	1,947	1,947		1,947
198	0605147T	OVERSEAS HUMANITARIAN ASSISTANCE SHARED INFORMATION SYSTEM (OHASIS)	310	310	310		310
199	060721008Z	INDUSTRIAL BASE ANALYSIS AND SUSTAINMENT SUPPORT	10,051	19,051	48,551	8,500	18,551
		Advanced systems manufacturing			[5,000]		
		Composite manufacturing technologies		[5,000]	[15,000]		
		Composite manufacturing technology		[5,000]			
		Lithium ion batteries		[4,000]			
		Printed circuit boards			[15,000]		

200	0607310D8Z	Rare earth element production	12,734	12,734	[3,500]	12,734	[3,500]
201	0607327T	CWMD SYSTEMS: OPERATIONAL SYSTEMS DEVELOPMENT	14,800	14,800	-4,450	10,350	
		GLOBAL THEATER SECURITY COOPERATION MANAGEMENT INFORMATION SYSTEMS (G-TSCMIS).					
202	0607384BP	Excess growth	54,023	54,023	[-4,450]	54,023	
		CHEMICAL AND BIOLOGICAL DEFENSE (OPERATIONAL SYSTEMS DEVELOPMENT).					
203	0208043J	PLANNING AND DECISION AID SYSTEM (PDAS)	4,537	4,537		4,537	
204	0208045K	C4I INTEROPERABILITY	64,122	64,122		64,122	
210	0302019K	DEFENSE INFO INFRASTRUCTURE ENGINEERING AND INTEGRATION	15,798	15,798		15,798	
211	0303126K	LONG-HAUL COMMUNICATIONS—DCS	11,166	11,166		11,166	
212	0303131K	MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK (MEECN)	17,383	17,383		17,383	
214	0303136G	KEY MANAGEMENT INFRASTRUCTURE (KMI)	54,516	54,516		54,516	
215	0303140D8Z	INFORMATION SYSTEMS SECURITY PROGRAM	67,631	89,631	25,000	92,631	
		AI and Cyber Center of Excellence			[25,000]		
		Cyber institutes for senior military colleges		[12,000]			
		Implementation of Cyber Excepted Service		[10,000]			
216	0303140G	INFORMATION SYSTEMS SECURITY PROGRAM	289,080	287,198	-1,882	287,198	
		Realignment to DISA for Sharkseer		[-1,882]			
217	0303140K	Sharkseer transfer	42,796	44,678	1,882	44,678	
		INFORMATION SYSTEMS SECURITY PROGRAM		[1,882]			
		Realignment for Sharkseer					
		Sharkseer transfer					
218	0303150K	GLOBAL COMMAND AND CONTROL SYSTEM	25,218	25,218		25,218	
219	0303153K	DEFENSE SPECTRUM ORGANIZATION	21,698	21,698		21,698	
220	0303228K	JOINT REGIONAL SECURITY STACKS (JRSS)	18,077	18,077		18,077	
222	0303430K	FEDERAL INVESTIGATIVE SERVICES INFORMATION TECHNOLOGY	44,001	44,001		44,001	
228	0305128V	SECURITY AND INVESTIGATIVE ACTIVITIES	2,400	2,400		2,400	
		Local criminal records access		[15,000]			
232	0305186D8Z	POLICY R&D PROGRAMS	6,301	6,301		6,301	
233	0305199D8Z	NET CENTRICITY	21,384	21,384		21,384	
235	0305208BB	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	6,359	6,359		6,359	

SEC. 4201. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION
(In Thousands of Dollars)

Line	Program Element	Item	FY 2020 Request	House Authorized	Senate Authorized	Conference Change	Conference Authorized
238	0305208K	DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS	2,981	2,981	2,981		2,981
241	0305327V	INSIDER THREAT	1,964	1,964	1,964		1,964
242	0305387D8Z	HOMELAND DEFENSE TECHNOLOGY TRANSFER PROGRAM	2,221	2,221	2,221		2,221
250	0708012K	LOGISTICS SUPPORT ACTIVITIES	1,361	1,361	1,361		1,361
251	0708012S	PACIFIC DISASTER CENTERS	1,770	1,770	1,770		1,770
252	0708047S	DEFENSE PROPERTY ACCOUNTABILITY SYSTEM	3,679	3,679	3,679		3,679
254	11052198B	MQ-9 UAV	20,697	20,697	20,697		20,697
256	11604038B	AVIATION SYSTEMS	245,795	263,021	254,595	17,200	262,995
		Program increase—Future Vertical Lift		[8,800]		[8,800]	
		Program increase—RFCM		[8,426]			
		UPL Future vertical lift			[8,800]		
		UPL FVL realignment from RFCM				[8,400]	
257	11604058B	INTELLIGENCE SYSTEMS DEVELOPMENT	15,484	15,484	15,484		15,484
258	11604088B	OPERATIONAL ENHANCEMENTS	166,922	166,922	166,922		166,922
259	11604318B	WARRIOR SYSTEMS	62,332	62,332	62,332		62,332
260	11604328B	SPECIAL PROGRAMS	21,805	21,805	21,805		21,805
261	11604348B	UNMANNED ISR	37,377	37,377	37,377		37,377
262	11604808B	SOF TACTICAL VEHICLES	11,150	11,150	11,150		11,150
263	11604838B	MARITIME SYSTEMS	72,626	72,626	72,626		72,626
264	11604898B	GLOBAL VIDEO SURVEILLANCE ACTIVITIES	5,363	5,363	5,363		5,363
265	11604908B	OPERATIONAL ENHANCEMENTS INTELLIGENCE	12,962	12,962	12,962		12,962
266	1203610K	TELEPORT PROGRAM	6,158	6,158	6,158		6,158
266A	99999999999	CLASSIFIED PROGRAMS	4,542,640	4,542,640	4,542,640		4,542,640
		SUBTOTAL OPERATIONAL SYSTEM DEVELOPMENT	6,258,398	6,383,624	6,345,698	46,250	6,304,648
267A	99999999999	UNDISTRIBUTED		119,000			
		Transfer to NRO for weather satellite procurement to mitigate weather capability gaps risk in 2022–2023.		[119,000]			

001	06051180TE	OPERATIONAL TEST AND EVALUATION	93,291	93,291	87,300	46,250	46,250	
002	06051310TE	LIVE FIRE TEST AND EVALUATION	69,172	69,172			69,172	
003	06058140TE	OPERATIONAL TEST ACTIVITIES AND ANALYSES	58,737	58,737			58,737	
		SUBTOTAL MANAGEMENT SUPPORT	221,200	221,200	221,200	198,872	221,200	
		TOTAL OPERATIONAL TEST & EVAL, DEFENSE	221,200	221,200	221,200	221,200	221,200	
		TOTAL OPERATIONAL TEST & EVAL, DW	24,772,953	24,572,855	25,085,253	198,872	24,971,825	
		SUBTOTAL UNDISTRIBUTED		125,226	87,300	46,250	46,250	
OPERATIONAL TEST & EVAL, DEFENSE MANAGEMENT SUPPORT								
		TOTAL RD&E	103,395,545	100,742,469	104,053,153	-1,085,699	102,309,846	

SEC. 4202. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION FOR OVERSEAS CONTINGENCY OPERATIONS.

SEC. 4202. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION FOR OVERSEAS CONTINGENCY OPERATIONS (In Thousands of Dollars)						
Line	Program Element	Item	FY 2020 Request	House Authorized	Senate Authorized	Conference Authorized
				Change	Change	
		RESEARCH, DEVELOPMENT, TEST & EVAL, ARMY				
		ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES				
074	0603327A	AIR AND MISSILE DEFENSE SYSTEMS ENGINEERING	500	500	500	500
079	0603747A	SOLDIER SUPPORT AND SURVIVABILITY	3,000	3,000	3,000	3,000
085	0603804A	LOGISTICS AND ENGINEER EQUIPMENT—ADV DEV	1,085	1,085	1,085	1,085
095	0604117A	MANEUVER—SHORT RANGE AIR DEFENSE (M-SHORAD)	6,000	6,000	6,000	6,000
		Unjustified request		[-6,000]		[-6,000]
097	0604119A	ARMY ADVANCED COMPONENT DEVELOPMENT & PROTOTYPING	4,529	4,529	4,529	4,529
105	0604785A	INTEGRATED BASE DEFENSE (BUDGET ACTIVITY 4)	2,000	2,000	2,000	2,000
		Unjustified request		[-2,000]		[-2,000]
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES	17,114	17,114	17,114	17,114
		SYSTEM DEVELOPMENT & DEMONSTRATION				
151	0605035A	COMMON INFRARED COUNTERMEASURES (CIRCW)	11,770	11,770	11,770	11,770
159	0605051A	AIRCRAFT SURVIVABILITY DEVELOPMENT	77,420	77,420	77,420	77,420
163	0605203A	ARMY SYSTEM DEVELOPMENT & DEMONSTRATION	19,527	19,527	19,527	19,527
174	0304270A	ELECTRONIC WARFARE DEVELOPMENT	3,200	3,200	3,200	3,200
		SUBTOTAL SYSTEM DEVELOPMENT & DEMONSTRATION	111,917	111,917	111,917	111,917
		RD&E MANAGEMENT SUPPORT				
200	0606003A	COUNTERINTEL AND HUMAN INTEL MODERNIZATION	1,875	1,875	1,875	1,875
		SUBTOTAL RD&E MANAGEMENT SUPPORT	1,875	1,875	1,875	1,875
		OPERATIONAL SYSTEMS DEVELOPMENT				
		UNDISTRIBUTED				

238	0303028A	SECURITY AND INTELLIGENCE ACTIVITIES	22,904	22,904	22,904	22,904	198,124
246	0305204A	TACTICAL UNMANNED AERIAL VEHICLES	34,100	34,100	34,100	34,100	34,100
247	0305206A	AIRBORNE RECONNAISSANCE SYSTEMS	14,000	14,000	14,000	14,000	14,000
252	0307665A	BIOMETRICS ENABLED INTELLIGENCE	2,214	2,214	2,214	2,214	2,214
		SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT	73,218	73,218	73,218	73,218	73,218
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, ARMY	204,124	196,124	204,124	-6,000	198,124
		RESEARCH, DEVELOPMENT, TEST & EVAL, NAVY					
		ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES					
028	0603207N	AIR/OCEAN TACTICAL APPLICATIONS	2,400	2,400	2,400	2,400	2,400
038	0603527N	RETRACT LARCH	22,000	22,000	22,000	22,000	22,000
057	0603654N	JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT	14,178	14,178	14,178	14,178	14,178
069	0603795N	LAND ATTACK TECHNOLOGY	1,428	1,428	1,428	1,428	1,428
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES	40,006	40,006	40,006	40,006	40,006
		SYSTEM DEVELOPMENT & DEMONSTRATION					
143	0604755N	SHIP SELF DEFENSE (DETECT & CONTROL)	1,122	1,122	1,122	1,122	1,122
		SUBTOTAL SYSTEM DEVELOPMENT & DEMONSTRATION	1,122	1,122	1,122	1,122	1,122
		OPERATIONAL SYSTEMS DEVELOPMENT					
		UNDISTRIBUTED					
228	0206313M	MARINE CORPS COMMUNICATIONS SYSTEMS	15,000	15,000	15,000	15,000	15,000
259A	9999999999	CLASSIFIED PROGRAMS	108,282	108,282	108,282	108,282	108,282
		SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT	123,282	123,282	123,282	123,282	123,282
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, NAVY	164,410	164,410	164,410	164,410	164,410
		RESEARCH, DEVELOPMENT, TEST & EVAL, AF					
		ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES					
048	0604858F	TECH TRANSITION PROGRAM	26,450	26,450	26,450	26,450	26,450
072	1206857F	SPACE RAPID CAPABILITIES OFFICE	17,885	17,885	17,885	17,885	17,885

SEC. 4202. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION FOR OVERSEAS CONTINGENCY OPERATIONS
(In Thousands of Dollars)

Line	Program Element	Item	FY 2020 Request	House Authorized	Senate Authorized	Conference Change	Conference Authorized
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT & PROTOTYPES	44,335	44,335	44,335		44,335
		OPERATIONAL SYSTEMS DEVELOPMENT					
		UNDISTRIBUTED					
177	0205671F	JOINT COUNTER RCIED ELECTRONIC WARFARE	4,000	4,000	4,000		4,000
217	0208288F	INTEL DATA APPLICATIONS	1,200	1,200	1,200		1,200
311A	9999999999	CLASSIFIED PROGRAMS	78,713	78,713	78,713		78,713
		SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT	83,913	83,913	83,913		83,913
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, AF	128,248	128,248	128,248		128,248
		RESEARCH, DEVELOPMENT, TEST & EVAL, DW					
		APPLIED RESEARCH					
010	0602134BR	COUNTER IMPROVISED-THREAT ADVANCED STUDIES	1,677	1,677	1,677		1,677
		SUBTOTAL APPLIED RESEARCH	1,677	1,677	1,677		1,677
		ADVANCED TECHNOLOGY DEVELOPMENT					
025	0603122D8Z	COMBATING TERRORISM TECHNOLOGY SUPPORT	25,230	25,230	25,230		25,230
027	0603134BR	COUNTER IMPROVISED-THREAT SIMULATION	49,528	49,528	49,528		49,528
		SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT	74,758	74,758	74,758		74,758
		ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES					
094	0604134BR	COUNTER IMPROVISED-THREAT DEMONSTRATION, PROTOTYPE DEVELOPMENT, AND TESTING.	113,590	113,590	113,590		113,590
		SUBTOTAL ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES	113,590	113,590	113,590		113,590
		OPERATIONAL SYSTEM DEVELOPMENT					

258	1160408BB	UNDISTRIBUTED							
259	1160431BB	OPERATIONAL ENHANCEMENTS	726	726	726	726	726	726	726
261	1160434BB	WARRIOR SYSTEMS	6,000	6,000	6,000	6,000	6,000	6,000	6,000
266A	9999999999	UNMANNED ISR	5,000	5,000	5,000	5,000	5,000	5,000	5,000
		CLASSIFIED PROGRAMS	200,199	200,199	200,199	200,199	200,199	200,199	200,199
		SUBTOTAL OPERATIONAL SYSTEM DEVELOPMENT	211,925	211,925	211,925	211,925	211,925	211,925	211,925
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, DW	401,950	401,950	401,950	401,950	401,950	401,950	401,950
		TOTAL RDT&E	898,732	890,732	898,732	898,732	898,732	-6,000	892,732

SEC. 4203. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION FOR EMERGENCY REQUIREMENTS.

SEC. 4203. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION FOR EMERGENCY REQUIREMENTS (In Thousands of Dollars)							
Line	Program Element	Item	FY 2020 Request	House Authorized	Senate Authorized	Conference Change	Conference Authorized
RESEARCH, DEVELOPMENT, TEST & EVAL, NAVY							
MANAGEMENT SUPPORT							
187	0605864N	TEST AND EVALUATION SUPPORT	0			129,000	129,000
		Earthquake damage recovery				[129,000]	
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, NAVY	0			129,000	129,000
RESEARCH, DEVELOPMENT, TEST & EVAL, AF							
MANAGEMENT SUPPORT							
128	0605807F	TEST AND EVALUATION SUPPORT	0			14,436	14,436
		Earthquake damage recovery				[14,436]	
138	0605976F	FACILITIES RESTORATION AND MODERNIZATION—TEST AND EVALUATION SUPPORT.	0			1,060	1,060
		Earthquake damage recovery				[1,060]	
		TOTAL RESEARCH, DEVELOPMENT, TEST & EVAL, AF	0			15,496	15,496
		TOTAL RDT&E	0			144,496	144,496