(1) **STUDY.**—The Secretary of Defense shall carry out a mobility capability and requirements study that estimates the number or airlift aircraft, tanker aircraft, and sealift ships needed to meet combatant commander requirements.

(2) **BRIEFING.**—Not later than September 30, 2018, the Secretary of Defense shall provide to the congressional defense committees a briefing on the results of the study carried out under paragraph (1). The briefing shall include—

(A) a detailed explanation of the strategy and associated force sizing and shaping constructs, associated scenarios, and assumptions used to conduct the analysis;

(B) estimated risk based on Chairman of the Joint Chiefs of Staff risk management classifications; and

(C) implications of operations in contested areas with regard to the Civil Reserve Air Fleet.

**TITLE II—RESEARCH, DEVELOPMENT, TEST, AND EVALUATION**

Subtitle A—Authorization of Appropriations

Sec. 201. Authorization of appropriations.
Sec. 211. Cost controls for presidential aircraft recapitalization program.
Sec. 212. Capital investment authority.
Sec. 213. Prizes for advanced technology achievements.
Sec. 214. Joint Hypersonics Transition Office.
Sec. 215. Department of Defense directed energy weapon system prototyping and demonstration program.
Sec. 216. Appropriate use of authority for prototype projects.
Sec. 217. Mechanisms for expedited access to technical talent and expertise at academic institutions to support Department of Defense missions.
Sec. 218. Modification of laboratory quality enhancement program.
Sec. 219. Reauthorization of Department of Defense Established Program to Stimulate Competitive Research.
Sec. 220. Codification and enhancement of authorities to provide funds for defense laboratories for research and development of technologies for military missions.
Sec. 221. Expansion of definition of competitive procedures to include competitive selection for award of science and technology proposals.
Sec. 222. Inclusion of modeling and simulation in test and evaluation activities for purposes of planning and budget certification.
Sec. 223. Limitation on availability of funds for F-35 Joint Strike Fighter Follow-On Modernization.
Sec. 224. Improvement of update process for populating mission data files used in advanced combat aircraft.
Sec. 225. Support for national security innovation and entrepreneurial education.
Sec. 226. Limitation on cancellation of designation Executive Agent for a certain Defense Production Act program.

Subtitle C—Reports and Other Matters
Sec. 231. Columbia-class program accountability matrices.
Sec. 232. Review of barriers to innovation in research and engineering activities of the Department of Defense.
Sec. 233. Pilot program to improve incentives for technology transfer from Department of Defense laboratories.
Sec. 234. Competitive acquisition plan for low probability of detection data link networks.
Sec. 235. Clarification of selection dates for pilot program for the enhancement of the research, development, test, and evaluation centers of the Department of Defense.
Sec. 236. Requirement for a plan to build a prototype for a new ground combat vehicle for the Army.

Subtitle A—Authorization of Appropriations

SEC. 201. AUTHORIZATION OF APPROPRIATIONS.

Funds are hereby authorized to be appropriated for fiscal year 2018 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. COST CONTROLS FOR PRESIDENTIAL AIRCRAFT RECAPITALIZATION PROGRAM.

(a) Fixed Capability Requirements.—Except as provided in subsection (b), the capability requirements for aircraft procured under the presidential aircraft recapitalization program of the Air Force (referred to in this section as the “PAR Program”) shall be the capability requirements identified in version 7.0.2 of the system requirement document for the PAR Program.

(b) Adjustments.—The Chief of Staff of the Air Force may adjust the capability requirements described in subsection (a) only if the Chief of Staff submits to the congressional defense committees a written determination that such adjustment is necessary—

(1) to resolve an ambiguity relating to the capability requirement;

(2) to address a problem with the administration of the capability requirement;

(3) to lower the development cost or life-cycle cost of the PAR program;
(4) to comply with a change in international, Federal, State, or local law or regulation that takes effect after September 30, 2017;

(5) to address a safety issue; or

(6) subject to subsection (c), to address an emerging threat or vulnerability.

(c) LIMITATION ON ADJUSTMENT FOR EMERGING THREAT OR VULNERABILITY.—The Chief of Staff of the Air Force may use the authority under paragraph (6) of subsection (b) to adjust the requirements described in subsection (a) only if the Secretary and the Chief of Staff of the Air Force, on a nondelegable basis—

(1) jointly determine that such adjustment is necessary and in the interests of the national security of the United States; and

(2) submit to the congressional defense committees notice of such joint determination.

(d) ANALYSIS FOR FIXED-PRICE TYPE CONTRACTS.—The Secretary of the Air Force shall work with the contractor and conduct an analysis of risk and explore opportunities to enter into additional fixed price type contracts for engineering and manufacturing development beyond the procurement of the unmodified commercial aircraft as described in paragraph (1).

(e) QUARTERLY BRIEFINGS.—
(1) **IN GENERAL.**—Beginning not later than October 1, 2017, and on a quarterly basis thereafter through October 1, 2022, the Secretary of the Air Force shall provide to the congressional defense committees a briefing on the efforts of the Secretary to control costs under the PAR Program.

(2) **ELEMENTS.**—Each briefing under paragraph (1) shall include, with respect to the PAR Program, the following:

(A) An overview of the program schedule.

(B) A description of each contract awarded under the program, including a description of the type of contract and the status of the contract.

(C) An assessment of the status of the program with respect to—
   (i) modification;
   (ii) testing;
   (iii) delivery; and
   (iv) sustainment.

(f) **SERVICE ACQUISITION EXECUTIVE DEFINED.**—In this section, the term “service acquisition executive” has the meaning given that term in section 101(a)(10) of title 10, United States Code.
SEC. 212. CAPITAL INVESTMENT AUTHORITY.

Section 2208(k)(2) of title 10, United States Code, is amended by striking “$250,000” and inserting “$500,000 for procurements by a major range and test facility installation or a science and technology reinvention laboratory and not less than $250,000 for procurements at all other facilities”.

SEC. 213. PRIZES FOR ADVANCED TECHNOLOGY ACHIEVEMENTS.

Section 2374a of title 10, United States Code, is amended—

(1) in subsection (a), by striking “in recognition of” and inserting “and other types of prizes that the Secretary determines are appropriate to recognize”;

(2) in subsection (c)—

(A) in paragraph (1), by striking “cash prize of” and inserting “prize with a fair market value of”;

(B) in paragraph (2), by striking “Under Secretary of Defense for Acquisition, Technology, and Logistics” and inserting “Under Secretary of Defense for Research and Engineering”; and

(C) by adding at the end the following new paragraph:
“(3) No prize competition may result in the award of a solely nonmonetary prize with a fair market value of more than $10,000 without the approval of the Under Secretary of Defense for Research and Engineering.”;

(3) in subsection (e)—

(A) by inserting “or nonmonetary items” after “accept funds”;

(B) by striking “and from State and local governments” and inserting “, from State and local governments, and from the private sector”; and

(C) by adding at the end the following:

“The Secretary may not give any special consideration to any private sector entity in return for a donation.”; and

(4) by amending subsection (f) to read as follows:

“(f) USE OF PRIZE AUTHORITY.—Use of prize authority under this section shall be considered the use of competitive procedures for the purposes of section 2304 of this title.”.

SEC. 214. JOINT HYPERSONICS TRANSITION OFFICE.

(a) REDESIGNATION.—The joint technology office on hypersonics in the Office of the Secretary of Defense is redesignated as the “Joint Hypersonics Transition Of-
Any reference in a law (other than this section), map, regulation, document, paper, or other record of the United States to the joint technology office on hypersonics shall be deemed to be a reference to the Joint Hypersonics Transition Office.


(1) in the heading of subsection (a), by striking “JOINT TECHNOLOGY OFFICE ON HYPERSONICS” and inserting “JOINT HYPERSONICS TRANSITION OFFICE”;

(2) in subsection (a)—

(A) in the first sentence, by striking “joint technology office on hypersonics” and inserting “Joint Hypersonics Transition Office (in this section referred to as the ‘Office’)”; and

(B) in the second sentence, by striking “office” and inserting “Office”;

(3) in subsection (b), by striking “joint technology office established under subsection (a)” and inserting “Office”; and
(4) by amending subsection (c) to read as follows:

“(c) RESPONSIBILITIES.—In carrying out the program required by subsection (b), the Office shall do the following:

“(1) Expedite testing, evaluation, and acquisition of hypersonic weapon systems to meet the stated needs of the warfighter, including flight testing, ground-based-testing, and underwater launch testing.

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

“(3) Undertake appropriate actions to ensure—

“(A) close and continuous integration of the programs on hypersonics of the military departments and the Defense Agencies with the programs on hypersonics across the Federal Government and with appropriate private sector and foreign organizations; and

“(B) that both foundational research and developmental and operational testing resources are adequate and well funded, and that facilities are made available in a timely manner to
support hypersonics research, demonstration programs, and system development.

“(4) Approve prototyping demonstration programs on hypersonic systems to speed the maturation and deployment of the systems to the warfighter.

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

“(6) Develop strategies and roadmaps for hypersonic technologies to transition to operational capabilities for the warfighter.

“(7) Coordinate with relevant stakeholders and agencies to support United States technological advantage in developing hypersonics.”;

(5) in subsection (d)(1), by striking “joint technology office established under subsection (a)” and inserting “Office”; and

(6) in subsection (e)—

(A) in paragraph (1), by striking “joint technology office established under subsection (a)” and inserting “Office”; and
(B) in paragraph (2), by striking “joint technology office” and inserting “Office”.

SEC. 215. DEPARTMENT OF DEFENSE DIRECTED ENERGY WEAPON SYSTEM PROTOTYPING AND DEMONSTRATION PROGRAM.

(a) Designation of Under Secretary of Defense for Research and Engineering as the Official With Principal Responsibility for Development and Demonstration of Directed Energy Weapons.—Subsection (a)(1) of section 219 of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114–328; 10 U.S.C. 2431 note) is amended by striking “Not later” and all that follows through “Department of Defense” and inserting “The Under Secretary of Defense for Research and Engineering shall serve”.

(b) Prototyping and Demonstration Program.—Such section is further amended by adding at the end the following new subsection:

“(c) Prototyping and Demonstration Program.—

“(1) Establishment.—The Secretary of Defense, acting through the Under Secretary, shall establish a program on the prototyping and demonstration of directed energy weapon systems to
build and maintain the military superiority of the United States by—

“(A) accelerating, when feasible, the fielding of directed energy weapon prototypes that would help counter technological advantages of potential adversaries of the United States; and

“(B) supporting the military departments, the combatant commanders, and other relevant defense agencies and entities in developing prototypes and demonstrating operational utility of high energy lasers and high powered microwave weapon systems.

“(2) GUIDELINES.—(A) Not later than 180 days after the date of the enactment of the National Defense Authorization Act for Fiscal Year 2018, the Under Secretary shall issue guidelines for the operation of the program established under paragraph (1), including the following:

“(i) Criteria required for an application for funding by a military department, defense agency or entity, or a combatant command.

“(ii) The priorities, based on validated requirements or capability gaps, for fielding prototype directed energy weapon system tech-
nologies developed by research funding of the Department or industry.

“(iii) Criteria for evaluation of an application for funding or changes to policies or acquisition and business practices by such a department, agency, or command for purposes of improving the effectiveness and efficiency of the program.

“(B) Funding for a military department, defense agency, or combatant command under the program established under paragraph (1) may only be available for advanced technology development, prototyping, and demonstrations in which the Department of Defense maintains management of the technical baseline and a primary emphasis on technology transition and evaluating military utility to enhance the likelihood that the particular directed energy weapon system will meet the Department end user’s need.

“(3) APPLICATIONS FOR FUNDING.—(A) Not less frequently than once each year, the Under Secretary shall solicit from the heads of the military departments, the defense agencies, and the combatant commands applications for funding under the program established under paragraph (1) to be used to
enter into contracts, cooperative agreements, or other transaction agreements entered into pursuant to section 2371b of title 10, United States Code, with appropriate entities for the prototyping or commercialization of technologies.

“(B) Nothing in this section shall be construed to require any official of the Department of Defense to provide funding under the program to any congressional earmark as defined pursuant to clause 9 of rule XXI of the Rules of the House of Representatives or any congressionally directed spending item as defined pursuant to paragraph 5 of rule XLIV of the Standing Rules of the Senate.

“(4) FUNDING.—(A) Except as provided in subparagraph (B) and subject to the availability of appropriations for such purpose, of the funds authorized to be appropriated by the National Defense Authorization Act for Fiscal Year 2018 or otherwise made available for fiscal year 2018 for research, development, test, and evaluation, defense-wide, up to $100,000,000 may be available to the Under Secretary to allocate to the military departments, the defense agencies, and the combatant commands to carry out the program established under paragraph (1).
“(B) Not more than half of the amounts made available under subparagraph (A) may be allocated as described in such paragraph until the Under Secretary—

“(i) develops the strategic plan required by subsection (a)(2)(A); and

“(ii) submits such strategic plan to the congressional defense committees.

“(5) UNDER SECRETARY DEFINED.—In this subsection, the term ‘Under Secretary’ means the Under Secretary of Defense for Research and Engineering in the Under Secretary’s capacity as the official with principal responsibility for the development and demonstration of directed energy weapons pursuant to subsection (a)(1).”.

SEC. 216. APPROPRIATE USE OF AUTHORITY FOR PROTOTYPE PROJECTS.

Section 2371b(d)(1)(A) of title 10, United States Code, is amended by inserting “or nonprofit research institution” after “defense contractor”.

SEC. 217. MECHANISMS FOR EXPEDITED ACCESS TO TECHNICAL TALENT AND EXPERTISE AT ACADEMIC INSTITUTIONS TO SUPPORT DEPARTMENT OF DEFENSE MISSIONS.

(a) ARRANGEMENTS AUTHORIZED.—
(1) IN GENERAL.—The Secretary of Defense and each secretary of a military department may establish one or more multi-institution task order contracts, consortia, cooperative agreements, or other arrangements to facilitate expedited access to university technical expertise, including faculty, staff, and students, in support of Department of Defense missions in the areas specified in subsection (e).

(2) USE FOR TECHNICAL ANALYSES AND ENGINEERING SUPPORT.—The Secretary may use an arrangement under paragraph (1) to fund technical analyses and other engineering support as required to address acquisition, management, and operational challenges, including support for classified programs and activities.

(b) LIMITATION.—An arrangement established under subsection (a)(1) may not be used to fund research programs that can be executed through other Department of Defense basic research activities.

(c) CONSULTATION WITH OTHER DEPARTMENT OF DEFENSE ACTIVITIES.—An arrangement established under subsection (a)(1) shall, to the degree practicable, be made in consultation with other Department of Defense activities, including federally funded research and development centers (FFRDCs), university affiliated research
centers (UARCs), and Defense laboratories and test centers, for purposes of providing technical expertise and reducing costs and duplicative efforts.

(d) POLICIES AND PROCEDURES.—If the Secretary of Defense or a secretary of a military department establishes one or more arrangements under subsection (a)(1), the Secretary of Defense shall establish and implement policies and procedures to govern—

(1) selection of participants in the arrangement or arrangements;

(2) the awarding of task orders under the arrangement or arrangements;

(3) maximum award size for tasks under the arrangement or arrangements;

(4) the appropriate use of competitive awards and sole source awards under the arrangement or arrangements; and

(5) technical areas under the arrangement or arrangements.

(e) MISSION AREAS.—The areas specified in this subsection are as follows:

(1) Cybersecurity.

(2) Air and ground vehicles.

(3) Shipbuilding.

(4) Explosives detection and defeat.
(5) Undersea warfare.

(6) Trusted electronics.

(7) Unmanned systems.

(8) Directed energy.

(9) Energy, power, and propulsion.

(10) Management science and operations research.

(11) Artificial intelligence.

(12) Data analytics.

(13) Business systems.

(14) Technology transfer and transition.

(15) Biological engineering and genetic enhancement.

(16) High performance computing.

(17) Materials science and engineering.

(18) Quantum information sciences.

(19) Special operations activities.

(20) Modeling and simulation.

(21) Autonomous systems.

(22) Model based engineering.

(23) Such other areas as the Secretary considers appropriate.

(f) SUNSET.—No new arrangements may be entered into under subsection (a)(1) after September 30, 2020.
(g) ARRANGEMENTS ESTABLISHED UNDER SUB-
SECTION (A)(1) DEFINED.—In this section, the term “ar-
range ment established under subsection (a)(1)” means a
multi-institution task order contract, consortia, coopera-
tive agreement, or other arrangement established under
subsection (a)(1).

SEC. 218. MODIFICATION OF LABORATORY QUALITY EN-
HANCEMENT PROGRAM.

(a) IN GENERAL.—Section 211 of the National De-
fense Authorization Act for Fiscal Year 2017 (Public Law
114–328) is amended—

(1) in subsection (a)(1)—

(A) in subparagraph (A), by striking “; and” and inserting a semicolon;

(B) in subparagraph (B), by striking the
semicolon and inserting “; and”; and

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

“(C) new interpretations of existing stat-
utes and regulations that would enhance the
ability of a director of a science and technology
reinvention laboratory to manage the facility
and discharge the mission of the laboratory;”;

(2) in subsection (d), by adding at the end the
following new paragraph:
“(3)(A) Each panel described in paragraph (1), (2), or (3) of subsection (b) shall submit to the panel described in paragraph (4) of such subsection (relating to governance and oversight processes) the following:

“(i) The findings of the panel with respect to the review conducted by the panel under subsection (a)(1)(C).

“(ii) The recommendations made by the panel under such subsection.

“(iii) Such comments, findings, and recommendations as the panel may have received by a science and technology reinvention laboratory with respect to—

“(I) the review conducted by the panel under such subsection; or

“(II) recommendations made by the panel under such subsection.

“(B)(i) The panel described in subsection (b)(4) shall review and refashion such recommendations as the panel may receive under subparagraph (A).

“(ii) In reviewing and refashioning recommendations under clause (i), the panel may, as the panel considers appropriate, consult with the science and technology executive of the affected service.
“(C) The panel described in subsection (b)(4) shall submit to the Under Secretary of Defense for Research and Engineering the recommendations made by the panel under subsection (a)(1)(C) and the recommendations re-fashioned by the panel under subparagraph (B) of this paragraph.”;

(3) by redesignating subsections (e) and (f) as subsection (f) and (g), respectively; and

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

“(e) INTERPRETATION OF PROVISIONS OF LAW.—(1) The Under Secretary of Defense for Research and Engineering, acting under the guidance of the Secretary, shall issue regulations regarding the meaning, scope, implementation, and applicability of any provision of a statute relating to a science and technology reinvention laboratory.

“(2) In interpreting or defining under paragraph (1), the Under Secretary shall, to the degree practicable, emphasize providing the maximum operational flexibility to the directors of the science and technology reinvention laboratories to discharge the missions of their laboratories.

“(3) In interpreting or defining under paragraph (1), the Under Secretary shall, to the extent practicable, consult and coordinate with the secretaries of the military departments and such other agencies or entities as the
Under Secretary considers relevant, on any proposed revision to regulations under paragraph (1).

“(4) In interpreting or defining under paragraph (1), the Under Secretary shall seek recommendations from the panel described in subsection (b)(4).”.

(b) TECHNICAL CORRECTIONS.—(1) Subsections (a), (c)(1)(C), and (d)(2) of such section are amended by striking “Assistant Secretary” each place it appears and inserting “Under Secretary”.

(2) Subparagraph (C) of section 342(b)(3) of the National Defense Authorization Act for Fiscal Year 1995 (Public Law 103–337), as amended by section 211(f) of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114–328), as redesignated by subsection (a)(3) of this section, is amended by striking “Assistant Secretary” and inserting “Under Secretary”.

SEC. 219. REAUTHORIZATION OF DEPARTMENT OF DEFENSE ESTABLISHED PROGRAM TO STIMULATE COMPETITIVE RESEARCH.

(a) MODIFICATION OF PROGRAM OBJECTIVES.—Subsection (b) of section 257 of the National Defense Authorization Act for Fiscal Year 1995 (Public Law 103–337; 10 U.S.C. 2358 note) is amended—

(1) by redesignating paragraphs (1) and (2) as paragraphs (2) and (3), respectively;
(2) by inserting before paragraph (2), as redesignated by paragraph (1), the following new paragraph (1):

“(1) To increase the number of university researchers in eligible States capable of performing science and engineering research responsive to the needs of the Department of Defense.’’; and

(3) in paragraph (2), as redesignated by paragraph (1), by inserting “relevant to the mission of the Department of Defense and’’ after “that is’’.

(b) MODIFICATION OF PROGRAM ACTIVITIES.—Subsection (c) of such section is amended—

(1) by redesignating paragraph (3) as paragraph (4); and

(2) by inserting after paragraph (2) the following new paragraph (3):

“(3) To provide assistance to science and engineering researchers at institutions of higher education in eligible States through collaboration between Department of Defense laboratories and such researchers.’’.

(c) MODIFICATION OF ELIGIBILITY CRITERIA FOR STATE PARTICIPATION.—Subsection (d) of such section is amended—
(1) in paragraph (2)(B), by inserting “in areas relevant to the mission of the Department of Defense” after “programs”; and

(2) by adding at the end the following new paragraph:

“(3) The Under Secretary shall not remove a designation of a State under paragraph (2) because the State exceeds the funding levels specified under subparagraph (A) of such paragraph unless the State has exceeded such funding levels for at least two consecutive years.”.

(d) Modification of Coordination Requirement.—Subsection (e) of such section is amended—

(1) in paragraph (1), by striking “shall” each place it appears and inserting “may”; and

(2) in paragraph (3), by inserting “relevant to the mission of the Department of Defense and” after “Research are”.

(e) Modification of Name.—

(1) In General.—Such section is amended—

(A) in subsections (a) and (e) by striking “Experimental” each place it appears and inserting “Established”; and

(B) in the section heading, by striking “EXPERIMENTAL” and inserting “ESTABLISHED”.

(2) **CLERICAL AMENDMENT.**—Such Act is amended, in the table of contents in section 2(b), by striking the item relating to section 257 and inserting the following new item:

“Sec. 257. Defense established program to stimulate competitive research.”.

(3) **CONFORMING AMENDMENT.**—Section 307 of the 1997 Emergency Supplemental Appropriations Act for Recovery from Natural Disasters, and for Overseas Peacekeeping Efforts, Including Those in Bosnia (Public Law 105–18) is amended by striking “Experimental” and inserting “Established”.

**SEC. 220. CODIFICATION AND ENHANCEMENT OF AUTHORITY TO PROVIDE FUNDS FOR DEFENSE LABORATORIES FOR RESEARCH AND DEVELOPMENT OF TECHNOLOGIES FOR MILITARY MISSIONS.**

(a) **IN GENERAL.**—Chapter 139 of title 10, United States Code, is amended by inserting after section 2362 the following new section:

“§ 2363. Mechanisms to provide funds for defense laboratories for research and development of technologies for military missions

“(a) **MECHANISMS TO PROVIDE FUNDS.**—(1) The Secretary of Defense, in consultation with the Secretaries of the military departments, shall establish mechanisms under which the director of a defense laboratory may use
an amount of funds equal to not less than two percent
and not more than four percent of all funds available to
the defense laboratory for the following purposes:

“(A) To fund innovative basic and applied re-
search that is conducted at the defense laboratory
and supports military missions.

“(B) To fund development programs that sup-
port the transition of technologies developed by the
defense laboratory into operational use.

“(C) To fund workforce development activities
that improve the capacity of the defense laboratory
to recruit and retain personnel with necessary sci-
entific and engineering expertise that support mili-
tary missions.

“(D) To fund the repair or minor military con-
struction of the laboratory infrastructure and equip-
ment, in accordance with subsection (b).

“(2) The mechanisms established under paragraph
(1) shall provide that funding shall be used under para-
graph (1) at the discretion of the director of a defense
laboratory in consultation with the science and technology
executive of the military department concerned.

“(3) The science and technology executive of a mili-
tary department may develop policies and guidance to le-
verage funding and promote cross-laboratory collabora-
tion, including with laboratories of other military depart-
ments.

“(4) After consultation with the science and tech-
nology executive of the military department concerned, the
director of a defense laboratory may charge customer ac-
tivities a fixed percentage fee, in addition to normal costs
of performance, in order to obtain funds to carry out ac-
tivities authorized by this subsection. The fixed fee may
not exceed four percent of costs.

“(b) Availability of Funds for Infrastructure Projects.—Funds shall be available in accordance
with subsection (a)(1)(D) only if—

“(1) the Secretary notifies the congressional de-
defense committees of the total cost of the project be-
fore the date on which the Secretary uses the mech-
anism under such subsection for such project; and

“(2) the Secretary ensures that the project
complies with the applicable cost limitations in—

“(A) section 2805(d) of this title, with re-
spect to revitalization and recapitalization
projects; and

“(B) section 2811 of this title, with respect
to repair projects.

“(c) Annual Report on Use of Authority.—(1)
Not later than March 1 of each year until March 1, 2025,
the Secretary of Defense shall submit to the congressional defense committees a report on the use of the authority under subsection (a) during the preceding year.

“(2) Each report under paragraph (1) shall include, with respect to the year covered by the report, the following:

“(A) A description of the mechanisms used to provide funding under subsection (a)(1).

“(B) A statement of the amount of funding made available to each defense laboratory for research described under such subsection.

“(C) A description of the investments made by each defense laboratory using funds under such subsection.

“(D) A description and assessment of any improvements in the performance of the defense laboratories as a result of investments under such subsection.

“(E) A description and assessment of the contributions to the development of needed military capabilities provided by research using funds under such subsection.

“(F) A description of any modification to the mechanisms under subsection (a) that would im-
prove the efficiency of the authority under such sub-
section to support military missions.”.

(b) CLERICAL AMENDMENT.—The table of sections
at the beginning of chapter 139 of such title is amended
by inserting after the item relating to section 2362 the
following new item:

“2363. Mechanisms to provide funds for defense laboratories for research and
development of technologies for military missions.”.

(c) CONFORMING AMENDMENTS.—(1) Section 219 of
the Duncan Hunter National Defense Authorization Act
for Fiscal Year 2009 (Public Law 110–417; 10 U.S.C.
2358 note), is hereby repealed.

(2) Section 2805(d)(1)(B) of title 10, United States
Code, is amended by striking “under section 219(a) of the
Duncan Hunter National Defense Authorization Act for
Fiscal Year 2009 (Public Law 110–417; 10 U.S.C. 2358
note)” and inserting “section 2363(a) of this title”.

SEC. 221. EXPANSION OF DEFINITION OF COMPETITIVE
PROCEDURES TO INCLUDE COMPETITIVE SE-
LECTION FOR AWARD OF SCIENCE AND
TECHNOLOGY PROPOSALS.

Section 2302(2)(B) of title 10, United States Code,
is amended by striking “basic research” and inserting
“science and technology”.
SEC. 222. INCLUSION OF MODELING AND SIMULATION IN TEST AND EVALUATION ACTIVITIES FOR PURPOSES OF PLANNING AND BUDGET CERTIFICATION.

Section 196 of title 10, United States Code, is amended—

(1) in subsection (d)(1), in the first sentence, by inserting ‘‘, including modeling and simulation capabilities’’ after ‘‘and resources’’; and

(2) in subsection (e)(1), by inserting ‘‘, including modeling and simulation activities,’’ after ‘‘evaluation activities’’.

SEC. 223. LIMITATION ON AVAILABILITY OF FUNDS FOR F–35 JOINT STRIKE FIGHTER FOLLOW-ON MODERNIZATION.

(a) IN GENERAL.—Not more than 25 percent of the funds authorized to be appropriated by this Act or otherwise made available for fiscal year 2018 or any other fiscal year for the Department of Defense may be obligated for F–35 Joint Strike Fighter Follow-On Modernization until the Secretary of Defense provides the final report required under section 224(b) of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114–328).

(b) DUAL CAPABLE AIRCRAFT.—Neither the limitation in subsection (a) nor the limitation in section 224(a) of the National Defense Authorization Act for Fiscal Year
2017 shall be construed to limit or otherwise restrict any
funding that is required to develop, certify, or deliver F–
35A dual capable aircraft.

SEC. 224. IMPROVEMENT OF UPDATE PROCESS FOR
POPULATING MISSION DATA FILES USED IN
ADVANCED COMBAT AIRCRAFT.

(a) IMPROVEMENTS TO UPDATE PROCESS.—

(1) IN GENERAL.—The Secretary of Defense
shall take such actions as may be necessary to im-
prove the process used to update the mission data
files used in advanced combat aircraft of the United
States so that such updates can occur more quickly.

(2) REQUIREMENTS.—In improving the process
under paragraph (1), the Secretary shall ensure the
following:

(A) That under such process, updates to
the mission data files are developed, operation-
ally tested, and loaded onto systems of ad-
vanced combat aircraft while in theaters of op-
eration in a time-sensitive manner to allow for
the distinguishing of threats, including distin-
guishing friends from foes, loading and delivery
of weapon suites, and coordination with allied
and coalition armed forces.
(B) When updates are made to the mission data files, all areas of responsibility (AoRs) are included.

(C) The process includes best practices relating to such mission data files that have been identified by industry and allies of the United States.

(D) The process improves the exchange of information between weapons systems of the United States and weapon systems of allies and partners of the United States, with respect to such mission data files.

(b) CONSULTATION AND PILOT PROGRAMS.—In carrying out subsection (a), the Secretary shall consult the innovation organizations resident in the Department of Defense and may consider carrying out a pilot program under another provision of this Act.

(c) REPORT.—Not later than March 31, 2018, the Secretary shall submit to the congressional defense committees a report on the actions taken by the Secretary under subsection (a)(1) and how the process described in such subsection has been improved.

SEC. 225. SUPPORT FOR NATIONAL SECURITY INNOVATION AND ENTREPRENEURIAL EDUCATION.

(a) SUPPORT AUTHORIZED.—
(1) IN GENERAL.—The Secretary of Defense may, acting through the Under Secretary of Defense for Research and Engineering, support national security innovation and entrepreneurial education programs.

(2) ELEMENTS.—Support under paragraph (1) may include the following:

(A) Materials to recruit participants, including veterans, for programs described in paragraph (1).

(B) Model curriculum for such programs.

(C) Training materials for such programs.

(D) Best practices for the conduct of such programs.

(E) Experimental learning opportunities for program participants to interact with operational forces and better understand national security challenges.

(F) Exchanges and partnerships with Department of Defense science and technology activities.

(G) Activities consistent with the Proof of Concept Commercialization Pilot Program established under section 1603 of the National

(b) CONFLICT.—In carrying out subsection (a), the Secretary may consult with the heads of such Federal agencies, universities, and public and private entities engaged in the development of advanced technologies as the Secretary determines to be appropriate.

(c) AUTHORITIES.—The Secretary may—

(1) develop and maintain metrics to assess national security innovation and entrepreneurial education activities to ensure standards for programs supported under subsection (b) are consistent and being met; and

(2) ensure that any recipient of an award under the Small Business Technology Transfer program, the Small Business Innovation Research program, and science and technology programs of the Department of Defense has the option to participate in training under a national security innovation and entrepreneurial education program supported under subsection (b).

(d) PARTICIPATION BY FEDERAL EMPLOYEES AND MEMBERS OF THE ARMED FORCES.—The Secretary may encourage Federal employees and members of the Armed Forces to participate in a national security innovation and
entrepreneurial education program supported under sub-
section (a) in order to gain exposure to modern innovation
and entrepreneurial methodologies.

(e) COORDINATION.—In carrying out this section, the
Secretary shall consider coordinating and partnering with
activities and organizations involved in the following:

(1) Hack the Army.

(2) Hack the Air Force.

(3) Hack the Pentagon.

(4) The Army Digital Service.


(7) Challenge and prize competitions of the De-
  fense Advanced Research Projects Agency
  (DARPA).


(9) The Small Business Innovation Research
  Program (SBIR).

(10) The Small Business Technology Transfer
  Program (STTR).

(11) War colleges of the military departments.

(12) Hacking for Defense.

(13) The National Security Science and Engi-
  neering Faculty Fellowship (NSSEFF) program.
(14) The Science, Mathematics and Research for Transformation (SMART) scholarship program.


SEC. 226. LIMITATION ON CANCELLATION OF DESIGNATION EXECUTIVE AGENT FOR A CERTAIN DEFENSE PRODUCTION ACT PROGRAM.

(a) LIMITATION ON CANCELLATION OF DESIGNATION.—The Secretary of Defense may not implement the decision, issued on July 1, 2017, to cancel the designation, under Department of Defense Directive 4400.1E, entitled “Defense Production Act Programs” and dated October 12, 2001, of the currently assigned Department of Defense Executive Agent for the program carried out under title III of the Defense Production Act of 1950 (50 U.S.C. 4531 et seq.) until the Secretary has—

(1) completed the review and assessment required by subsection (b)(1); and

(2) carried out the briefing required by subsection (c).

(b) REVIEW AND ASSESSMENT REQUIRED.—

(1) IN GENERAL.—The Secretary of Defense, in consultation with the Secretary of the Air Force, shall conduct a review and assessment of the program described in subsection (a).
(2) ELEMENTS.—The review and assessment required by paragraph (1) shall include the following:

(A) Assessment of the current management structure for the program, including analysis of the mechanisms for accountability, as well as cost and management controls currently in place.

(B) Analysis of alternatives for proposals to modify that management structure to increase accountability, cost and management controls. Such analysis of alternatives should consider the relative merits of centralization and decentralization, roles of other military departments in program management and contracting, as well as the different roles the Office of the Secretary of Defense might play in management, oversight and execution.

(C) Recommendations for improving the assessment and selection of projects in order to—

(i) ensure that projects selected are appropriate for use of funds appropriated to carry out title III of the Defense Production Act of 1950;
(ii) ensure that sufficient vetting and management controls are in place to ensure a reasonable degree of confidence that project ideas or the companies being supported will be viable; and

(iii) increase overall successful execution for selected projects.

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

(c) BRIEFING REQUIRED.—The Secretary shall brief the appropriate Committees of Congress on the findings of the Secretary with respect to the review and assessment conducted under subsection (b).

(d) NOTIFICATION REQUIRED.—In the event the Secretary of Defense decides to cancel the designation, under Department of Defense Directive 4400.1E, entitled “Defense Production Act Programs” and dated October 12, 2001, of the currently assigned Department of Defense Executive Agent for the program described in subsection (a), the Secretary shall submit to the appropriate committees of Congress a written notification of such decision at least 60 days before the decision goes into effect.

(e) APPROPRIATE COMMITTEES OF CONGRESS DEFINED.—In this section, the term “appropriate committees of Congress” means the—
(1) the Committee on Armed Services and the Committee on Banking, Housing, and Urban Affairs of the Senate; and

(2) the Committee on Armed Services and the Committee on Financial Services of the House of Representatives.

Subtitle C—Reports and Other Matters

SEC. 231. COLUMBIA-CLASS PROGRAM ACCOUNTABILITY MATRICES.

(a) Submittal of Matrices.—Concurrent with the President’s annual budget request submitted to Congress under section 1105 of title 31, United States Code, for fiscal year 2019, the Secretary of the Navy shall submit to the congressional defense committees and the Comptroller General of the United States the matrices described in subsection (b) relating to the Columbia-class program.

(b) Matrices Described.—The matrices described in this subsection are the following:

(1) Design and Construction Goals.—A matrix that identifies, in six-month increments, key milestones, development events, and specific performance goals for the design and construction of the Columbia-class program, which shall be subdivided, at a minimum, according to the following:
(A) Technology-readiness levels of major components and key demonstration events.

(B) Design maturity.

(C) Manufacturing-readiness levels for critical manufacturing operations and key demonstration events.

(D) Manufacturing operations.

(E) Reliability.

(2) Cost.—A matrix expressing, in annual increments, the total cost phased over the entire Columbia-class design and construction period of—

(A) the Navy service cost position for the prime contractor’s portion of Columbia-class design and construction activities, including the estimated price at completion for each submarine and confidence level of this estimate;

(B) the program manager’s estimate for the prime contractor’s portion of Columbia-class design and construction activities, including the estimated price and variance at completion for each submarine; and

(C) the prime contractor’s estimate for the prime contractor’s portion of Columbia-class design and construction activities, including the
estimated price and variance at completion for each submarine.

(c) **Update of Matrices.**—

(1) **In General.**—Not later than 180 days after the date on which the Secretary of the Navy submits the matrices required by subsection (a), and concurrent with the submittal of each annual budget request to Congress under section 1105 of title 31, United States Code, beginning with the fiscal year 2020 request, the Secretary of the Navy shall submit to the congressional defense committees and the Comptroller General of the United States updates to the matrices described in subsection (b).

(2) **Elements.**—Each update submitted under paragraph (1) shall detail progress made toward the goals identified in the matrix described in subsection (b)(1) and provide updated cost data as prescribed in subsection (b)(2).

(3) **Treatment of Initial Matrices as Baseline.**—The matrices submitted pursuant to subsection (a) shall be treated as the baseline for the full Columbia-class design and construction period for purposes of the updates submitted pursuant to paragraph (1) of this subsection.
(4) **Report Termination.**—The report required under paragraph (1) shall terminate upon delivery of the first Columbia-class submarine.

(d) **Assessment by Comptroller General of the United States.**—Not later than 90 days after the date on which the Comptroller General of the United States receives an update to a matrix under subsection (c)(1), the Comptroller General shall review such matrix and provide to the congressional defense committees an assessment of such matrix in whatever form that the Comptroller General deems appropriate.

(e) **Repeal of Report Requirement.**—Section 131 of the National Defense Authorization Act for Fiscal Year 2016 (129 Stat. 754; Public Law 114–92) is hereby repealed.

(f) **Major Component Defined.**—In this section, the term “major component” includes, at a minimum, the integrated power system, nuclear reactor, propulsor and related coordinated stern features, stern area system, and common missile compartment.

**SEC. 232. Review of Barriers to Innovation in Research and Engineering Activities of the Department of Defense.**

(a) **Review.**—The Secretary of Defense, acting through the Under Secretary of Defense for Research and
Engineering, shall review directives, rules, regulations, and other policies that adversely affect the ability of the innovation, research, and engineering enterprise of the Department of Defense to effectively and efficiently execute its missions, including policies and practices concerning the following:

(1) Personnel and talent management.
(2) Financial management and budgeting.
(3) Infrastructure, installations, and military construction.
(4) Acquisition.
(5) Management.
(6) Such other areas as the Secretary may designate.

(b) REPORT.—Not later than one year after the date of the enactment of this Act, the Secretary shall submit to the congressional defense committees a report on—

(1) the findings of the Secretary with respect to the review conducted under subsection (a);
(2) proposed changes in directives, rules, regulations, and other policies that will enhance the ability of the innovation, research, and engineering enterprise of the Department to execute its designated missions, including a description of how proposed changes have been coordinated with other ap-
propriate Secretaries of the military departments and the appropriate heads of the defense agencies; and

(3) processes by which new directives, rules, regulations, and other policies will be reviewed for their potential to adversely affect the ability of the innovation, research, and engineering enterprise of the Department and the lead official designated to execute such review in consultation with other relevant and appropriate Secretaries of the military departments and heads of defense agencies.

SEC. 233. PILOT PROGRAM TO IMPROVE INCENTIVES FOR TECHNOLOGY TRANSFER FROM DEPARTMENT OF DEFENSE LABORATORIES.

(a) IN GENERAL.—The Secretary of Defense shall establish a pilot program to assess the feasibility and advisability of distributing royalties and other payments as described in this section. Under the pilot program, except as provided in subsections (b) and (d), any royalties or other payments received by a Federal agency from the licensing and assignment of inventions under agreements entered into by Department of Defense laboratories, and from the licensing of inventions of Department of Defense laboratories, shall be retained by the laboratory which produced the invention and shall be disposed of as follows:
The laboratory director shall pay each year the first $2,000, and thereafter at least 20 percent, of the royalties or other payments, other than payments of patent costs as delineated by a license or assignment agreement, to the inventor or coinventors, if the inventor’s or coinventor’s rights are directly assigned to the United States.

A laboratory director may provide appropriate incentives, from royalties or other payments, to laboratory employees who are not an inventor of such inventions but who substantially increased the technical value of the inventions.

The laboratory shall retain the royalties and other payments received from an invention until the laboratory makes payments to employees of a laboratory under subparagraph (A) or (B).

The balance of the royalties or other payments shall be transferred by the agency to its laboratories, with the majority share of the royalties or other payments from any invention going to the laboratory where the invention occurred. The royalties or other payments so transferred to any laboratory may be used or obligated by that laboratory during the fiscal year in which they are received or during the 2 succeeding fiscal years—
(A) to reward scientific, engineering, and technical employees of the laboratory, including developers of sensitive or classified technology, regardless of whether the technology has commercial applications;

(B) to further scientific exchange among the laboratories of the agency;

(C) for education and training of employees consistent with the research and development missions and objectives of the agency or laboratory, and for other activities that increase the potential for transfer of the technology of the laboratories of the agency;

(D) for payment of expenses incidental to the administration and licensing of intellectual property by the agency or laboratory with respect to inventions made at that laboratory, including the fees or other costs for the services of other agencies, persons, or organizations for intellectual property management and licensing services; or

(E) for scientific research and development consistent with the research and development missions and objectives of the laboratory.
(3) All royalties or other payments retained by the laboratory after payments have been made pursuant to paragraphs (1) and (2) that are unobligated and unexpended at the end of the second fiscal year succeeding the fiscal year in which the royalties and other payments were received shall be paid into the Treasury of the United States.

(b) Treatment of Payments to Employees.—

(1) In general.—Any payment made to an employee under the pilot program shall be in addition to the regular pay of the employee and to any other awards made to the employee, and shall not affect the entitlement of the employee to any regular pay, annuity, or award to which the employee is otherwise entitled or for which the employee is otherwise eligible or limit the amount thereof. Any payment made to an inventor as such shall continue after the inventor leaves the laboratory.

(2) Cumulative Payments.—(A) Cumulative payments made under the pilot program while the inventor is still employed at the laboratory shall not exceed $500,000 per year to any one person, unless the Secretary concerned (as defined in section 101(a) of title 10, United States Code) approves a larger award.
(B) Cumulative payments made under the pilot program after the inventor leaves the laboratory shall not exceed $150,000 per year to any one person, unless the head of the agency approves a larger award (with the excess over $150,000 being treated as an agency award to a former employee under section 4505 of title 5, United States Code).

(c) INVENTION MANAGEMENT SERVICES.—Under the pilot program, a laboratory receiving royalties or other payments as a result of invention management services performed for another Federal agency or laboratory under section 207 of title 35, United States Code, may retain such royalties or payments to the extent required to offset payments to inventors under subparagraph (A) of subsection (a)(1), costs and expenses incurred under subparagraph (D) of subsection (a)(2), and the cost of foreign patenting and maintenance for any invention of the other agency. All royalties and other payments remaining after offsetting the payments to inventors, costs, and expenses described in the preceding sentence shall be transferred to the agency for which the services were performed, for distribution in accordance with subsection (a)(2).

(d) CERTAIN ASSIGNMENTS.—Under the pilot program, if the invention involved was one assigned to the laboratory—
(1) by a contractor, grantee, or participant, or
an employee of a contractor, grantee, or participant,
in an agreement or other arrangement with the
agency; or

(2) by an employee of the agency who was not
working in the laboratory at the time the invention
was made,

the agency unit that was involved in such assignment shall
be considered to be a laboratory for purposes of this sec-
tion.

(e) SunSet.—The pilot program under this section
shall terminate 5 years after the date of the enactment
of this Act.

SEC. 234. COMPETITIVE ACQUISITION PLAN FOR LOW
PROBABILITY OF DETECTION DATA LINK
NETWORKS.

(a) Plan Required.—The Under Secretary of De-
fense for Acquisition, Technology, and Logistics and the
Vice Chairman of the Joint Chiefs of Staff shall jointly,
in consultation with the Secretary of the Navy and the
Secretary of the Air Force, develop a plan to procure a
secure, low probability of detection data link network ca-
pability with the ability to effectively operate in hostile
jamming environments while preserving the low observable
characteristics of the relevant platforms, between existing and planned—

(1) fifth-generation combat aircraft;

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

(3) 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

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

(b) Additional Plan Requirements.—The plan required by subsection (a) shall include—

(1) nonproprietary and open systems approaches compatible with the Rapid Capabilities Office Open Mission Systems initiative of the Air Force and the Future Airborne Capability Environment initiative of the Navy;

(2) a competitive acquisition process, to include comparative flight demonstrations in realistic airborne environments; and
(3) low risk and affordable solutions with minimal impact or changes to existing host platforms, and minimal overall integration costs.

(c) BRIEFING.—Not later than February 15, 2018, the Under Secretary and the Vice Chairman shall provide to the congressional defense committees a potential acquisition strategy and briefing on the plan developed under subsection (a).

(d) LIMITATION.—Of the funds authorized to be appropriated by this Act or otherwise made available for fiscal year 2018 for operations and maintenance for the Office of the Secretary of the Air Force and the Office of the Secretary of the Navy, not more than 85 percent may be obligated or expended until a period of 15 days has elapsed following the date on which the Under Secretary and Vice Chairman submits to the congressional defense committees the plan required by subsection (a).

SEC. 235. CLARIFICATION OF SELECTION DATES FOR PILOT PROGRAM FOR THE ENHANCEMENT OF THE RESEARCH, DEVELOPMENT, TEST, AND EVALUATION CENTERS OF THE DEPARTMENT OF DEFENSE.

Section 233 of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114–328) is amended—
(1) in subsection (b)(2), by striking “the enactment of this Act” both places it appears and inserting “such submittal”; and

(2) in subsection (c)(1), by striking “propose and implement” and inserting “submit to the Assistant Secretary concerned a proposal on, and implement,”.

SEC. 236. REQUIREMENT FOR A PLAN TO BUILD A PROTOTYPE FOR A NEW GROUND COMBAT VEHICLE FOR THE ARMY.

(a) In General.—Not later than February 1, 2018, the Secretary of the Army shall submit to the congressional defense committees a plan to build a prototype for a new ground combat vehicle for the Army.

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

(1) A description of how the Secretary intends to exploit the latest enabling component technologies that have the potential to dramatically change basic combat vehicle design and improve lethality, protection, mobility, range, and sustainment, including an analysis of capabilities of the most advanced foreign ground combat vehicles and whether any have characteristics that should inform the development of the Army’s prototype vehicle, including whether any
United States allies or partners have advanced capabilities that could be directly incorporated in the prototype.

(2) The schedule, cost, key milestones, and leadership plan to rapidly design and build the prototype ground combat vehicle.

SEC. 237. PLAN FOR SUCCESSFULLY FIELDING THE INTEGRATED AIR AND MISSILE DEFENSE BATTLE COMMAND SYSTEM.

(a) PLAN REQUIRED.—Not later than February 1, 2018, the Secretary of the Army shall submit to the congressional defense committees a plan to successfully field a suitable, survivable, and effective Integrated Air and Missile Defense Battle Command System program.

(b) LIMITATION.—Not more than 50 percent of the funds authorized to be appropriated by this Act for research, development, test, and evaluation may be obligated by the Secretary of the Army for the Army Integrated Air and Missile Defense and the Integrated Air and Missile Defense Battle Command System until the date on which the plan is submitted under subsection (a).

TITLE III—OPERATION AND MAINTENANCE

Subtitle A—Authorization of Appropriations

Sec. 301. Authorization of appropriations.

Subtitle B—Energy and Environment
sufficient levels of policy compliant cluster munitions into statute in future legislative actions, if necessary.

**Littoral Combat Ship**

The Senate amendment contained a provision (sec. 14015) that would increase the amount authorized for the Littoral Combat Ship program by $600.0 million and increase the reduction of fuel savings in section 4301 by $600.0 million.

The House bill contained no similar provision.

The Senate recedes.

**TITLE II—RESEARCH, DEVELOPMENT, TEST, AND EVALUATION**

**SUBTITLE A—AUTHORIZATION OF APPROPRIATIONS**

Authorization of appropriations (sec. 201)

The House bill contained a provision (sec. 201) that would authorize appropriations for research, development, test, and evaluation at the levels identified in section 4201 of division D of this Act.

The Senate amendment contained a similar provision (sec. 201).

The Senate recedes.

**SUBTITLE B—PROGRAM REQUIREMENTS, RESTRICTIONS, AND LIMITATIONS**

Cost controls for presidential aircraft recapitalization program (sec. 211)

The House bill contained a provision (sec. 211) that would establish cost controls for the Presidential Aircraft Recapitalization program.

The Senate amendment contained no similar provision.

The Senate recedes with an amendment that would change the version of the system requirements document the program requirements are fixed to and give the Chief of Staff of the Air Force the authority to make adjustments to the capability requirements, subject to certain limitations, vice the Secretary of the Air Force.
Capital investment authority (sec. 212)

The House bill contained a provision (sec. 212) that would amend section 2208(k)(2) of title 10, United States Code, to raise the limit on in-house capital purchases using defense working capital funds from $250,000 to $500,000.

The Senate amendment contained no similar provision. The Senate recedes with an amendment that would restrict the limit increase to a major range and test facility installation or a science and technology reinvention laboratory, but maintains the $250,000 limit for other types of facilities utilizing this authority.

Prizes for advanced technology achievements (sec. 213)

The House bill contained a provision (sec. 213) that would amend section 2374a of title 10, United States Code, to make permanent the Secretary of Defense’s authority to award prizes for advanced technology achievements, to allow for the award of non-monetary awards, and to authorize the acceptance of non-monetary items from other parts of the Federal Government, from State government, and from non-governmental sources.

The Senate amendment contained a similar provision (sec. 214) that would amend section 2374a of title 10, United States Code, which authorizes the defense research enterprise to carry out programs to award prizes in recognition of outstanding achievements in basic, advanced, and applied research, technology development, and prototype development that have the potential for application to the performance of the military missions of the Department of Defense (DOD). The provision would also authorize the Department to accept funds from the private sector to help fund prize awards and reduce the overall cost of prize competitions.

The House recedes with technical amendments to clarify several aspects of the new authority for non-monetary awards.

Joint Hypersonics Transition Office (sec. 214)

The House bill contained a provision (sec. 215) that would re-designate the “Joint Technology Office on Hypersonics” as the “Joint Hypersonics Transition Office”, with the responsibility to coordinate and integrate programs, ensure coordination of current and future programs of the Department of Defense on hypersonics, and approve demonstrations.

The Senate amendment contained a similar provision (sec. 235) that would express the sense of Congress that the Department of Defense should expedite testing, evaluation, and
acquisition of hypersonic weapon systems to meet the stated needs of the warfighter; that the United States cannot afford to lose its advantage over foreign countries in developing hypersonic weapons; and that the Department of Defense should focus on the next generation of weapon systems such as hypersonics.

The Senate recedes with an amendment that would expand the stated responsibilities of the newly designated office.

Department of Defense directed energy weapon system prototyping and demonstration program (sec. 215)

The Senate amendment contained a provision (sec. 219) that would designate the Under Secretary of Defense for Research and Engineering as the official with principal responsibility for development and demonstration of directed energy weapons, pursuant to section 219(a)(1) of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114-328). The provision would also authorize funds to be used exclusively for high energy laser and high power microwave prototyping and demonstrations, but withhold 50 percent of those funds until the Under Secretary develops and submits to Congress a strategic plan.

The House bill contained no similar provision.

The Senate recedes with an amendment that would make technical, clarifying changes to the provision.

Appropriate use of authority for prototype projects (sec. 216)

The House bill contained a provision (sec. 225) that would amend Section 2371b(d)(1)(A) of title 10, United States Code by allowing nonprofit research institutions to enter into transactions with the Department of Defense for prototype projects.

The Senate amendment contained no similar provision.

The Senate recedes.

Mechanisms for expedited access to technical talent and expertise at academic institutions to support Department of Defense missions (sec. 217)

The Senate amendment contained a provision (sec. 211) that would give the Secretary of Defense the authority to establish one or more multi-institution task order contracts, consortia, cooperative agreements, or other arrangements with universities that do not have similar existing constructs to facilitate expedited access to university technical expertise in support of
Department of Defense mission areas, such as cybersecurity, explosives detection, modeling and simulation, microelectronics, unmanned systems, advanced materials, machine learning, and myriad others.

The House bill contained no similar provision.

The House recedes with an amendment that would make technical clarification in the authorities provided in this provision.

Modification of laboratory quality enhancement program (sec. 218)

The Senate amendment contained a provision (sec. 213) that would modify the Laboratory Quality Enhancement Program established in section 211 of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114–328). The recommended provision would provide the clarifications necessary to proceed with implementation as envisioned in the original statute. The recommended provision would also add some new responsibilities for the panels created in the original statute and establish their relationship to the Under Secretary of Defense for Research and Engineering, established in section 901 of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114–328).

The House bill contained no similar provision.

The House recedes with an amendment that would specify that the Under Secretary shall consult and coordinate with appropriate departments, agencies, and entities in carrying out certain authorities.

Reauthorization of Department of Defense Established Program to Stimulate Competitive Research (sec. 219)

The Senate amendment contained a provision (sec. 5201) that would amend subsections (b), (c), and (d) of section 257 of the National Defense Authorization Act for Fiscal Year 1995 (Public Law 103–337; 10 U.S.C. 2358 note).

The House bill contained no similar provision.

The House recedes with a technical amendment.

Codification and enhancement of authorities to provide funds for defense laboratories for research and development of technologies for military missions (sec. 220)

The Senate amendment contained a provision (sec. 10203) that would amend Chapter 139 of title 10, United States Code, to codify and enhance the research authorities of the defense

The House bill contained no similar provision.
The House recedes with a technical, clarifying amendment.

Expansion of definition of competitive procedures to include competitive selection for award of science and technology proposals (sec. 221)

The Senate amendment contained a provision (sec. 215) that would amend section 2302 of title 10, United States Code, to expand the definition of competitive procedures to include research and development proposals.
The House bill contained no similar provision.
The House recedes with an amendment that would clarify and specify the types of proposals eligible for competitive procedures.
The conferees note that the amended language in the final provision is meant to include all activities that comprise budget activities 1 through 4 (i.e. 6.1-6.4).

Inclusion of modeling and simulation in test and evaluation activities for purposes of planning and budget certification (sec. 222)

The Senate amendment contained a provision (sec. 216) that would amend section 196 of title 10, United States Code, to include modeling and simulation activities in the test and evaluation strategic plan and proposed test and evaluation budgets.
The House bill contained no similar provision.
The House recedes.

Limitation on availability of funds for F-35 Joint Strike Fighter Follow-On Modernization (sec. 223)

The Senate amendment contained a provision (sec. 221) that would limit the funds available for the F-35 Joint Strike Fighter Follow-On Modernization (FOM) program until the Secretary of Defense submits the report containing the basic elements of an acquisition program baseline for Block 4 modernization as required by section 224 of the National Defense Authorization Act (NDAA) for Fiscal Year 2017 (Public Law 114-238).
The House bill contained no similar amendment.
The House recedes with an amendment that would reduce the limitation to seventy-five percent of the funds authorized to be appropriated for F-35 FOM and a clarification that the limitations included in this provision and in section 224 of the NDAA for Fiscal Year 2017 shall not be construed to limit or restrict funding necessary to develop, certify, or deliver F-35A dual capable aircraft.

*Improvement of update process for populating mission data files used in advanced combat aircraft (sec. 224)*

The Senate amendment contained a provision (sec. 222) that would require the Department of Defense to refine the process of updating mission data files used in advanced combat aircraft so that they may be updated more quickly.

The House bill contained no similar provision.

The House recedes.

*Support for national security innovation and entrepreneurial education (sec. 225)*

The House bill contained a provision (sec. 222) that would authorize the Secretary of Defense to establish a Hacking for Defense program under which the Secretary may obligate or expend up to $15,000,000 to support university-based entrepreneurial education programs, including: (A) materials to recruit veterans for such programs; (B) model curriculum for such programs; (C) training materials for such programs; and (D) best practices for the conduct of such programs.

The Senate amendment contained a similar provision (sec. 10201) that would authorize the Secretary of Defense to support national security innovation and entrepreneurial education programs. The provision would also authorize the Secretary to develop and maintain metrics to assess these activities and ensure that any recipient of a small business award has the option to participate in training under this program.

The House recedes with an amendment that would clarify the existing Department of Defense activities with which the Secretary of Defense should consider coordinating and partnering in executing the activities of this program.

The conferees recognize that the ability of the Department of Defense to respond to evolving national security challenges would benefit by a workforce that is increasingly exposed to, and has an understanding of, modern problem-solving techniques and innovative methodologies. The conferees also believe that by presenting national security problems to universities and education centers, increasingly diverse stakeholder
participation will aid in the rapid development of solutions to national security challenges and improve Department of Defense recruitment of young technologists and engineers with critical skill sets, including cyber capabilities. These sorts of programs may also be useful in providing a unique pathway for veterans, federal employees, and military personnel to leverage their training, experience, and expertise to solve emerging national security challenges while learning cutting-edge business innovation methodologies.

Limitation on cancellation of designation Executive Agent for a certain Defense Production Act program (sec. 226)

The Senate amendment contained a provision (sec. 14006) that would require that the Secretary of the Air Force to continue serving as the Department of Defense Executive Agent for the Defense Production Act Programs.

The House bill contained no similar provision.

The House recedes with an amendment that would require the Secretary of Defense to complete a review and assessment of the Defense Production Act Title III program and brief the appropriate committees of jurisdiction. The amendment would also establish that the Secretary of Defense shall not change the assigned Department of Defense Executive Agent for the program prior to briefing the appropriate committees of jurisdiction.

SUBTITLE C - REPORTS AND OTHER MATTERS

Columbia-class program accountability matrices (sec. 231)

The House bill contained a provision (sec. 214) that would deem certain Columbia-class ballistic missile submarine components as critical technologies.

The Senate amendment contained no similar provision.

The Senate recedes with an amendment that would require submittal and periodic updates of matrices on Columbia-class cost, design and construction goals. The Comptroller General of the United States would be required to review and assess each periodic update. The amendment would also repeal section 131 of the National Defense Authorization Act for Fiscal Year 2016 (Public Law 114-92).

Review of barriers to innovation in research and engineering activities of the Department of Defense (sec. 232)
The Senate amendment contained a provision (sec. 220) that would require the establishment of a process under which the Under Secretary of Defense for Research and Engineering would review and modify Department of Defense regulations that would adversely affect the innovative capacity of the DOD.

The House bill contained no similar provision.

The House recedes with an amendment that would require the Secretary of Defense to provide an annual report to the congressional defense committees, developed in coordination with relevant Under Secretaries and Service Secretaries, describing specific impediments to innovation and methods by which to address such impediments. The report shall also articulate the process for review of directives, rules, regulations, and other policies for their potential to adversely affect the ability of the research and engineering enterprise of the Department of Defense to execute its designated missions.

Pilot program to improve incentives for technology transfer from Department of Defense laboratories (sec. 233)

The House bill contained a provision (sec. 223) that would require the Secretary of Defense, in coordination with the Secretary of Energy, to conduct a pilot program among defense laboratories (as defined in section 2199 of title 10, United States Code), national laboratories (as defined in section 188(f) of title 10, United States Code), and private entities to facilitate the licensure, transfer, and commercialization of innovative technologies.

The Senate amendment contained a similar provision (sec. 5202) that would require the Secretary of Defense to establish a pilot program to assess the feasibility and advisability of distributing royalties and other payments to the inventors or co-inventors of technologies whose rights are directly assigned to the United States. The pilot program under this section would terminate five years after the date of the enactment of this Act.

The House recedes.

The conferees are aware that questions have been raised regarding the transfer of some technology developed by the national laboratories when using Department of Defense funding. The conferees therefore direct the Administrator for Nuclear Security and the Secretary of Defense to provide a briefing to the Armed Services Committees of the Senate and House of Representatives no later than January 30, 2018. This briefing should address plans to improve opportunities for technology transfer with regard to defense technology that was developed by the nuclear security laboratories for the Department of Defense.
or military services, including a description of which agency owns such technology and opportunities for coordination to facilitate technology transfer, as appropriate.

Competitive acquisition plan for low probability of detection data link networks (sec. 234)

The Senate amendment contained a provision (sec. 231) that would require the Under Secretary of Defense for Acquisition, Technology and Logistics (USD AT&L) (or its successor) and the Vice Chairman of the Joint Chiefs of Staff (VCJCS) to provide a plan for a competitive acquisition process to procure a secure, low probability of detection data link network capability.

The House bill contained no similar provision.

The House recedes with an amendment that would specify that the USD AT&L and VCJCS provide the defense committees potential acquisition strategies and would change the limitation of funds from the offices of the Secretary of Defense and Chairman of the Joint Chiefs of Staff to the offices of the Secretary of the Air Force and the Secretary of the Navy.

Clarification of selection dates for pilot program for the enhancement of the research, development, test, and evaluation centers of the Department of Defense (sec. 235)

The Senate amendment contained a provision (sec. 232) that would make clarifications and edits to the laboratory management demonstration program established in section 233 of the National Defense Authorization Act for Fiscal Year 2017 (Public Law 114–328). The provision would clarify the date limitations for consideration of an application to join the pilot program, and it would also clarify that any proposals pursuant to the pilot program shall be submitted to the appropriate assistant secretary.

The House bill contained no similar provision.

The House recedes.

Requirement for a plan to build a prototype for a new ground combat vehicle for the Army (sec. 236)

The Senate amendment contained a provision (sec. 233) that would require the Secretary of the Army to submit a report to the congressional defense committees on a plan to build a prototype for a new ground combat vehicle within 90 days of the enactment of this Act.

The House bill contained no similar provision.
The House recedes with an amendment that would require the Secretary of the Army to submit its plan not later that February 1, 2018.

The conferees encourage the Secretary of the Army to use all available acquisition authorities to the fullest extent possible to plan to build a prototype for a new ground combat vehicle. The conferees are interested in how the Army intends to exploit the latest enabling component technologies that have the potential to dramatically change basic combat vehicle design and improve lethality, protection, mobility, range, and sustainment. The required report should include an analysis of capabilities of the most advanced foreign ground combat vehicles and whether any have characteristics that should inform the development of the Army's prototype vehicle, including whether any U.S. allies or partners have advanced capabilities that could be directly incorporated in the prototype. Such technologies would include vehicle active protection systems with hard and soft kill capabilities, reactive armor, composite armor, thermal signature reduction, noise reduction, fuel cell propulsion, opposed-piston engines, 32 speed transmissions, suspension, power generation, voltage management, 3rd generation forward looking infrared sights, integrated hostile fire detection, manned-unmanned teaming, automatic loaders, munitions, and cannons.

Plan for successfully fielding the Integrated Air and Missile Defense Battle Command System (sec. 237)

The Senate amendment contained a provision (sec. 234) that would require the Secretary of the Army to submit to the congressional defense committees a plan to successfully field a suitable, survivable, and effective Integrated Air and Missile Defense Battle Command System (IBCS) program. The committee directs the Secretary to submit this plan within 180 days of the enactment of this Act. Furthermore, none of the funds authorized may be obligated until receipt of the Army's report.

The House Bill contained no similar provision.

The House recedes with an amendment that would require the Secretary of the Army to submit its plan not later than February 1, 2018. The amendment also stipulates that not more than 50 percent of the funds authorized may be obligated by the Secretary of the Army.

The conferees are concerned that this developmental program is not meeting schedule and performance objectives after having become a program of record over 7 years ago. The conferees are aware that the Army has delayed a Milestone C decision for limited production for 4 years.
Given that the Army has already expended over $2.1 billion on this program with the expected requirement to spend much more, the conferees are concerned current software will soon become obsolete before a functional IBCS is fielded.

**LEGISLATIVE PROVISIONS NOT ADOPTED**

Codification and enhancement of authorities to provide funds for defense laboratories for research and development of technologies for military missions

The Senate amendment contained a provision (sec. 212) that would amend chapter 139 of title 10, United States Code, to codify the research authorities of the defense laboratories originally established in section 219 of the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009 (Public Law 110-417) and improved and made permanent in subsequent legislation.

The Senate amendment also contained a provision (sec. 10202) that would remove force and effect from section 212. The Senate recedes. The conferees note that the codification of these authorities is contained elsewhere in this Act.

Hypersonic airbreathing weapons capabilities

The House bill contained a provision (sec. 216) that would allow the Secretary of Defense to transfer oversight and management of the Hypersonic Airbreathing Weapons Concept from the Defense Advanced Research Projects Agency to an entity of the Air Force.

The Senate amendment contained no similar provision. The House recedes.

Limitation on availability of funds for MQ-25 unmanned air system

The House bill contained a provision (sec. 217) that would limit funding for the MQ-25 program until certain conditions are met.

The Senate amendment contained no similar provision. The House recedes.

Differentiation of research and development activities from service activities
The Senate amendment contained a provision (sec. 217) that would differentiate between research and development activities and service activities through the establishment of clear definitions for each activity.
The House bill contained no similar provision.
The Senate recedes.

Limitation on availability of funds for contract writing systems

The House bill contained a provision (sec. 218) that would limit the availability of funds for contract writing systems.
The Senate amendment contained no similar provision.
The House recedes.
The conferees remain concerned that the military services continue to procure individual, functionally stove-piped business systems when there appear to be efficiencies and cost-savings that might be gained by consolidating acquisitions around areas with similar requirements. The conferees are encouraged by the Department of Defense’s efforts to take a portfolio approach to contract-writing systems. The conferees recognize the challenge in reducing and consolidating the overall numbers of systems based on the lack of sustained focus on overall information technology modernization, but the burgeoning focus on data transparency vice systems integration indicates that this problem may be surmountable over time as current practices take hold within the Department.
Based on the progress in this area, the conferees encourage the Department to initiate or accelerate such efforts in other areas, to include personnel and pay, financial management, and enterprise resource programs. In addition to a portfolio approach, the conferees believe that these initiatives could be accelerated by leveraging the use of fixed-price contracting, pursuing the use of commercial-off-the-shelf solutions that minimize customization, and more frequent delivery of increments.
The conferees also encourage the Department to leverage the pilot program for agile and iterative development for software systems elsewhere in this Act as a means to test out some of the concepts, and to serve as a pathfinder for other programs.

Strategy for use of virtual training technology

The House bill contained a provision (sec. 219) that would require the Secretary of Defense to direct the head of each military department to establish a comprehensive strategy to determine what capability gaps exist in the department that can
be rectified with virtual training; to review the virtual training possibilities for this gap to determine what virtual training would rectify this gap most efficiently; and to determine what acquisitions would need to be made to acquire the correct amount of technology to achieve desired goals.

The Senate amendment contained no similar provision.

The House recedes.

Increase in funding for electronics and electronic devices of the Army

The House bill contained a provision (sec. 220) that would increase funding for Applied Research, Electronics and Electronic Devices.

The Senate amendment contained no similar provision.

The House recedes.

Increase in funding for Historically Black Colleges and Universities and Minority Institutions

The House bill contained a provision (sec. 221) that would authorize funds to be appropriated in section 4201 for research, development, test, and evaluation, Defense-wide, as specified in the corresponding funding table in section 4201, for Basic Research, Historically Black Colleges and Universities/Minority Institutions, Line 006, to increase by $4,135,000.

The Senate amendment contained a similar provision (sec. 236) that would authorize funds to be appropriated in Research, Development, Test, and Evaluation, Defense-wide, PE 61228D8Z, section 4201, for Basic Research, Historically Black Colleges and Universities/Minority Institutions, Line 006, to increase by $12,000,000.

The House recedes.

The Senate recedes.

The conferees note that historically black colleges and universities (HBCUs) and minority-serving institutions (MSI) play a vital role in educating diverse and underrepresented students in areas of national security need, particularly in areas of science, technology, engineering, and mathematics. For many years, these institutions have been collaborating with the Department of Defense in research and development efforts that contribute to the defense readiness and national security of the nation. The conferees have supported both greater participation among HBCU/MSI, as well as increased opportunities within the Department of Defense to find means to leverage that expertise more broadly, such as through internships, outside review committees and advisory groups.
Furthermore, the conferees recognize that these institutions are vital in developing the next generation of scientists and engineers who will help lead the Department of Defense in addressing high-priority national security challenges. It is important to further engage HBCUs and minority-serving institutions in university research and innovation, especially in prioritizing software development and cyber security by utilizing existing Department of Defense labs, and collaborating with existing programs that help attract candidates, including programs like the Air Force Minority Leaders Programs, which recruit Americans from diverse background to serve their country through service in our Nation's military.

The conferees also note that although these provisions are not adopted, the increase in funds authorized by them is still included in the funding tables in Section 4201.

**STEM(MM) jobs action plan**

The House bill contained a provision (sec. 224) that would direct the Secretary of Defense, in conjunction with the Secretary of each military department to perform an assessment of the science, technology, engineering, math, maintenance, and manufacturing (STEM(MM)) workforce for organizations within the Department of Defense, including the numbers and types of positions and the expectations for losses due to retirements and voluntary departures; identify the types and quantities of STEM(MM) jobs needed to support future mission work; determine the shortfall between lost STEM(MM) personnel and future requirements; analyze and explain the appropriateness and impact of using reimbursable and working capital fund dollars for new STEM(MM) hires; identify a plan of action to address the STEM(MM) jobs gap, including hiring strategies and timelines for replacement of STEM(MM) employees; and deliver to Congress, not later than December 31, 2018, a report specifying such plan of action.

The Senate amendment contained no similar provision.

The House recedes.

The conferees note that jobs in STEM(MM) make up a significant portion of the workforce of the Department of Defense. Many of these jobs exist within the organic industrial base, research, development, and engineering centers, life-cycle management commands, and logistics centers of the Department, and are thus vital to the mission of all of the military services. Because the demographics of personnel of the Department indicate that many of the STEM(MM) personnel of the Department will be eligible to retire in the next few years, the
conferees believe the Department should be taking decisive, proactive action to ensure there is sufficient personnel for these areas, and that any further skills and knowledge gap does not lead to a serious readiness gap.

Jet noise reduction program of the Navy

The House bill contained a provision (sec. 226) that would authorize the Secretary of the Navy to carry out a jet noise reduction program.

The Senate amendment contained no similar provision.

The House recedes.

Process for coordination of studies and analysis research of the Department of Defense

The House bill contained a provision (sec. 227) that would require the Secretary of Defense to implement a Department of Defense-wide process under which the heads of the military departments and Defense Agencies responsible for managing requests for studies and analysis research would be required to coordinate annual research requests and ongoing research efforts to minimize duplication and reduce costs.

The Senate amendment contained no similar provision.

The House recedes.

Very-low profile hardware to interact with the Mobile User Objective Systems and other systems

The Senate amendment contained a provision (sec. 10205) that would increase funding for the Joint Tactical Information Distribution System. The funding increase would also allow the Secretary of Defense to study and demonstrate very-low profile hardware, such as antennae and chipsets, with software, encryption, and cyber and network management tools necessary to interact with the Mobile User Objective System (MUOS) and other systems that are considered part of the Internet of Things to provide command, control, communications, and cyber restoral capabilities.

The House bill had no similar provision.

The Senate recedes.

**TITLE III—OPERATION AND MAINTENANCE**

**SUBTITLE A—AUTHORIZATION OF APPROPRIATIONS**