

**H.R. 2500—FY20 NATIONAL DEFENSE
AUTHORIZATION BILL**

**SUBCOMMITTEE ON TACTICAL AIR
AND LAND FORCES**

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DIVISION A—DEPARTMENT OF DEFENSE AUTHORIZATIONS

TITLE I—PROCUREMENT

LEGISLATIVE PROVISIONS

SUBTITLE C—NAVY PROGRAMS

Section 1xx—Limitation on Availability of Funds Pending Quarterly Updates on the CH-53K King Stallion Helicopter Program

This section would limit obligation or expenditure of 50 percent of the procurement funds for the CH-53K King Stallion helicopter until 30 days after the Secretary of the Navy provides the House Committee on Armed Services the first required quarterly briefing on program status and resolution of technical deficiencies as compared to the CH-53K joint integrated program schedule. This section does not apply to any funds authorized to be appropriated by this Act for the development of the CH-53K.

SUBTITLE D—AIR FORCE PROGRAMS

Section 1xx—F-15EX Aircraft Program

This section would require the Secretary of Defense to designate the F-15EX program as a major subprogram and subject it to relevant reporting requirements and criteria pertinent to a major subprogram. The section would allow the Secretary of the Air Force to procure two F-15EX aircraft for prototype development but would prohibit the procurement of any additional aircraft until 30 days after the Secretary submits F-15EX program plans for development, acquisition, and fielding to the congressional defense committees.

Section 1xx—Limitation on Availability of Funds for Retirement of RC-135 Aircraft

This section would prohibit any use of funds authorized to be appropriated in fiscal year 2020 for the Air Force to retire, or prepare to retire, any RC-135 aircraft until 60 days after the date on which the Secretary of Defense certifies to the congressional defense committees that equivalent RC-135 capacity and capability exists to meet combatant commander requirements for indications and warning, intelligence preparation of the operational environment, and direct support to kinetic and non-kinetic operations.

Section 1xx—Report on Aircraft Fleet of the Civil Air Patrol

This section would require the Secretary of the Air Force to submit a report to the congressional defense committees not later than 90 days after the date of the enactment of this Act on the Civil Air Patrol (CAP) that identifies and assesses the suitability of the current CAP aircraft fleet size, types of aircraft, and operating locations to meet mission requirements.

SUBTITLE E—DEFENSE-WIDE, JOINT, AND MULTISERVICE MATTERS

Section 1xx—Economic Order Quantity Contracting and Buy-to-Budget Acquisition for F-35 Aircraft Program

This section would authorize the Secretary of Defense to procure economic order quantities of material and equipment for the F-35 program. This section would also authorize the Secretary to procure F-35 aircraft exceeding the quantity otherwise authorized by this Act if procurement of additional aircraft would not require additional funds to be authorized or appropriated.

Section 1xx—Program Requirements for the F-35 Aircraft Program

This section would require the Secretary of Defense to designate Block 4 capability as a major subprogram of the F-35 program and subject Block 4 to relevant reporting requirements and criteria pertinent to a major subprogram. This section would require the Secretaries of the Air Force and the Navy to develop a joint service cost position for F-35 life-cycle costs, and require the Director, Cost Assessment and Program Evaluation to develop an independent life-cycle cost estimate for comparison. This section would also require the Secretary of Defense to revise the Department of Defense's program element structure for F-35 beginning with the fiscal year 2021 President's budget request and subsequent budget requests to provide sufficient transparency regarding future F-35 costs. Finally, this section would require the Comptroller General of the United States to provide an annual report for five consecutive years, submitted each year not later than 30 days after the President's annual budget submission to Congress, that reviews the F-35 program.

Section 1xx—Reports on F-35 Aircraft Program

This section would require the Secretary of Defense to provide reports to the congressional defense committees on F-35 reliability and maintainability metrics, Block 4 capability development and fielding activities, and modernization and upgrade plans for the F-35 Autonomic Logistics Information System.

TITLE II—RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

LEGISLATIVE PROVISIONS

SUBTITLE B—PROGRAM REQUIREMENTS, RESTRICTIONS, AND LIMITATIONS

Section 2xx—Documentation Relating to Advanced Battle Management System

This section would require the Secretary of the Air Force to provide program documentation for the Advanced Battle Management System (ABMS) family of systems.

The fiscal year 2019 budget request for the Air Force cancelled the long-planned Joint Surveillance Target Attack Radar System recapitalization and included a small amount of funding in existing programs as a bridge to a new concept for comprehensive battle management command and control. The committee notes that this concept, the Advanced Battle Management System, envisions several existing airborne and ground intelligence, surveillance, and reconnaissance (ISR) and command and control systems connected by resilient, protected communications and data links.

The budget request provided limited programmatic details on ABMS. The committee is concerned with the lack of discernible benchmarks to assess and measure progress. The committee understands that the ABMS Analysis of Alternatives (AOA) will conclude in 2019. At that time, the committee expects the Air Force to complete the documentation requested by this section and submit it to the congressional defense committees not later than 180 days after completion of the AOA.

The committee also notes that Air Force modernization plans rely on introducing artificial intelligence and machine learning into a range of major weapon systems. Given the intended capability of ABMS, the committee believes the Air Force should consider prototyping and demonstrating the utility of artificial intelligence and automated sensor fusion as part of the ABMS concept.

Section 2xx—Sensor Data Integration for Fifth Generation Aircraft

This section would require the Secretary of Defense to ensure fifth generation aircraft such as the F-35, F-22, and B-21 can share and disseminate data collected by on-board sensors with other joint service users and platforms. This section would further require the Comptroller General of the United States to assess and provide an interim briefing to the congressional defense committees within 180 days after the date of the enactment of this Act, the Department's doctrinal, organizational, and technological methods of managing sensor data collected by fifth generation aircraft and the ability of fifth generation aircraft to share information collected in real-time with other joint service users and platforms.

Section 2xx—Quarterly Updates on the Optionally Manned Fighting Vehicle Program

This section would require the Assistant Secretary of the Army for Acquisition, Logistics, and Technology to provide quarterly briefings, beginning October 1, 2019, to the congressional defense committees on the status and progress of the Optionally Manned Fighting Vehicle program.

TITLE X—GENERAL PROVISIONS

LEGISLATIVE PROVISIONS

SUBTITLE F—STUDIES AND REPORTS

Section 10xx—Army Aviation Strategic Plan and Modernization Roadmap

This section would require the Secretary of the Army to provide a comprehensive strategy to the congressional defense committees by March 30, 2020, for Army aviation to ensure alignment between requirements, future Army budget submissions, and authorization of appropriations. The required strategy would cover both current and future multi-domain operations for Army aviation.

The fiscal year 2020 budget request for the Army included several significant changes to aviation modernization programs. While these changes may align with the long-term Army aviation strategy, the committee is concerned with the absence of such a strategy that incorporates both current and future capabilities.

Section 10xx—Report on Ground-Based Long-Range Artillery to Counter Land and Maritime Threats

This section would require the Secretary of Defense to provide a report to the congressional defense committees not later than March 1, 2020, on the integration of emerging long range ground-based fires to counter land and maritime threats, particularly those in the U.S. Indo-Pacific Command and U.S. European Command areas of responsibility.

BILL LANGUAGE

1 **SEC. 1** [Log 69560]. **LIMITATION ON AVAILABILITY OF**
2 **FUNDS PENDING QUARTERLY UPDATES ON**
3 **THE CH-53K KING STALLION HELICOPTER**
4 **PROGRAM.**

5 (a) **LIMITATION.**—Of the funds authorized to be ap-
6 propriated by this Act or otherwise made available for fis-
7 cal year 2020 for aircraft procurement, Navy, for the CH-
8 53K King Stallion helicopter program, not more than 50
9 percent may be obligated or expended until a period of
10 30 days has elapsed following the date on which the Sec-
11 retary of the Navy provides the first briefing required
12 under subsection (b).

13 (b) **QUARTERLY BRIEFINGS REQUIRED.**—

14 (1) **IN GENERAL.**—Beginning not later than
15 October 1, 2019, and on a quarterly basis thereafter
16 through October 1, 2022, the Secretary of the Navy
17 shall provide to the Committee on Armed Services of
18 the House of Representatives a briefing on the
19 progress of the CH-53K King Stallion helicopter
20 program.

21 (2) **ELEMENTS.**—Each briefing under para-
22 graph (1) shall include, with respect to the CH-53K
23 King Stallion helicopter program, the following:

24 (A) An overview of the program schedule.

1 (B) A statement of the total cost of the
2 program as of the date of the briefing, includ-
3 ing the costs of development, testing, and pro-
4 duction.

5 (C) A comparison of the total cost of the
6 program relative to the approved acquisition
7 program baseline.

8 (D) An assessment of flight testing under
9 the program, including identification of the
10 number of test events have been conducted on-
11 time in accordance with the joint integrated
12 program schedule.

13 (E) An update on the correction of tech-
14 nical deficiencies under the program, includ-
15 ing—

16 (i) identification of the technical defi-
17 ciencies that have been corrected as of the
18 date of the briefing;

19 (ii) identification of the technical defi-
20 ciencies that have been discovered, but not
21 corrected, as of such date;

22 (iii) an estimate of the total cost of
23 correcting technical deficiencies under the
24 program; and

1 (iv) an explanation of any significant
2 deviations from the testing and program
3 schedule that are anticipated due to the
4 discovery and correction of technical defi-
5 ciencies.

1 **SEC. 1** **[Log 69528]. F-15EX AIRCRAFT PROGRAM.**

2 (a) DESIGNATION OF MAJOR SUBPROGRAM.—In ac-
3 cordance with section 2430a of title 10, United States
4 Code, the Secretary of Defense shall designate the F-
5 15EX program as a major subprogram of the F-15 air-
6 craft program.

7 (b) LIMITATION.—Except as provided in subsection
8 (c), none of the funds authorized to be appropriated by
9 this Act or otherwise made available for fiscal year 2020
10 for the Air Force may be obligated or expended to procure
11 an F-15EX aircraft until a period of 30 days has elapsed
12 following the date on which the Secretary of the Air Force
13 submits to the congressional defense committees the fol-
14 lowing documentation relating to the F-15EX program:

- 15 (1) A program acquisition strategy.
16 (2) An acquisition program baseline.
17 (3) A test and evaluation master plan.
18 (4) A life-cycle sustainment plan.
19 (5) A post-production fielding strategy.

20 (c) EXCEPTION FOR PRODUCTION OF PROTO-
21 TYPES.—

22 (1) IN GENERAL.—Notwithstanding subsection
23 (b), the Secretary of the Air Force may use the
24 funds described in paragraph (2) to develop,

1 produce, and test not more than two prototypes of
2 the F-15EX aircraft.

3 (2) FUNDS DESCRIBED.—The funds described
4 in this paragraph are funds authorized to be appro-
5 priated by this Act or otherwise made available for
6 fiscal year 2020 for the Air Force for any of the fol-
7 lowing:

8 (A) Research and development, non-
9 recurring engineering.

10 (B) Aircraft procurement.

11 (d) F-15EX PROGRAM DEFINED.—In this section,
12 the term “F-15EX program” means the F-15EX aircraft
13 program of the Air Force as described in the materials
14 submitted to Congress by the Secretary of Defense in sup-
15 port of the budget of the President for fiscal year 2020
16 (as submitted to Congress under section 1105(a) of title
17 31, United States Code).

1 **SEC. 1** **[Log 69668]. LIMITATION ON AVAILABILITY OF**
2 **FUNDS FOR RETIREMENT OF RC-135 AIR-**
3 **CRAFT.**

4 (a) **LIMITATION.**—Except as provided in subsection
5 (b), none of the funds authorized to be appropriated by
6 this Act or otherwise made available for fiscal year 2020
7 for the Air Force may be obligated or expended to retire,
8 or prepare to retire, any RC-135 aircraft until a period
9 of 60 days has elapsed following the date on which the
10 Secretary of Defense certifies to the congressional defense
11 committees that—

12 (1) technologies other than the RC-135 aircraft
13 provide capacity and capabilities equivalent to the
14 capacity and capabilities of the RC-135 aircraft;
15 and

16 (2) the capacity and capabilities of such other
17 technologies meet the requirements of combatant
18 commanders with respect to indications and warn-
19 ing, intelligence preparation of the operational envi-
20 ronment, and direct support for kinetic and non-ki-
21 netic operations.

22 (b) **EXCEPTION.**—The limitation in subsection (a)
23 shall not apply to individual RC-135 aircraft that the Sec-
24 retary of the Air Force determines, on a case-by-case

- 1 basis, to be no longer mission capable because of mishaps,
- 2 other damage, or being uneconomical to repair.

1 **SEC. 1** ___ **[Log 69740]. REPORT ON AIRCRAFT FLEET OF**
2 **THE CIVIL AIR PATROL.**

3 (a) REPORT.—Not later than 90 days after the date
4 of the enactment of this Act, the Secretary of the Air
5 Force shall submit to the congressional defense commit-
6 tees a report on the aircraft fleet of the Civil Air Patrol.

7 (b) ELEMENTS.—The report required by subsection
8 (a) shall include an assessment of each of the following:

9 (1) Whether the number of aircraft, types of
10 aircraft, and operating locations that comprise the
11 Civil Air Patrol fleet are suitable for the missions
12 and responsibilities assigned to the Civil Air Patrol,
13 including—

14 (A) flight proficiency and training;

15 (B) operational mission training; and

16 (C) support for cadet orientation and cadet
17 flight training programs in the Civil Air Patrol
18 wing of each State.

19 (2) The ideal overall size of the Civil Air Patrol
20 aircraft fleet, including a description of the factors
21 used to determine that ideal size.

22 (3) The process used by the Civil Air Patrol
23 and the Air Force to determine the number and lo-
24 cation of aircraft operating locations and whether

1 State Civil Air Patrol wing commanders are appro-
2 priately involved in that process.

3 (4) The process used by the Civil Air Patrol,
4 the Air Force, and other relevant entities to deter-
5 mine the type and number of aircraft that are need-
6 ed to support the emergency, operational, and train-
7 ing missions of the Civil Air Patrol.

1 **SEC. 1** **[Log 69520]. ECONOMIC ORDER QUANTITY CON-**
2 **TRACTING AND BUY-TO-BUDGET ACQUI-**
3 **SION FOR F-35 AIRCRAFT PROGRAM.**

4 (a) ECONOMIC ORDER QUANTITY CONTRACT AU-
5 THORITY.—

6 (1) IN GENERAL.—Subject to paragraphs (2)
7 through (5), from amounts made available for obli-
8 gation under the F–35 aircraft program for fiscal
9 year 2020, the Secretary of Defense may enter into
10 one or more contracts, beginning with the fiscal year
11 2020 program year, for the procurement of economic
12 order quantities of material and equipment that has
13 completed formal hardware qualification testing for
14 the F–35 aircraft program for use in procurement
15 contracts to be awarded for such program during
16 fiscal years 2021, 2022, and 2023.

17 (2) LIMITATION.—The total amount obligated
18 under all contracts entered into under paragraph (1)
19 shall not exceed \$574,000,000.

20 (3) PRELIMINARY FINDINGS.—Before entering
21 into a contract under paragraph (1), the Secretary
22 of Defense shall make each of the following findings
23 with respect to such contract:

1 (A) The use of such a contract will result
2 in significant savings of the total anticipated
3 costs of carrying out the program through an-
4 nual contracts.

5 (B) The minimum need for the property to
6 be procured is expected to remain substantially
7 unchanged during the contemplated contract
8 period in terms of production rate, procurement
9 rate, and total quantities.

10 (C) There is a reasonable expectation that,
11 throughout the contemplated contract period,
12 the Secretary will request funding for the con-
13 tract at the level required to avoid contract can-
14 cellation.

15 (D) That there is a stable, certified, and
16 qualified design for the property to be procured
17 and that the technical risks and redesign risks
18 associated with such property are low.

19 (E) The estimates of both the cost of the
20 contract and the anticipated cost avoidance
21 through the use of an economic order quantity
22 contract are realistic.

23 (F) Entering into the contract will pro-
24 mote the national security interests of the
25 United States.

1 (4) CERTIFICATION REQUIREMENT.—Except as
2 provided in paragraph (5), the Secretary of Defense
3 may not enter into a contract under paragraph (1)
4 until a period of 30 days has elapsed following the
5 date on which the Secretary certifies to the congres-
6 sional defense committees, in writing, that each of
7 the following conditions is satisfied:

8 (A) A sufficient number of end items of
9 the system being acquired under such contract
10 have been delivered at or within the most re-
11 cently available estimates of the program acqui-
12 sition unit cost or procurement unit cost for
13 such system to determine that the estimates of
14 the unit costs are realistic.

15 (B) During the fiscal year in which such
16 contract is to be awarded, sufficient funds will
17 be available to perform the contract in such fis-
18 cal year, and the future-years defense program
19 submitted to Congress under section 221 of
20 title 10, United States Code, for that fiscal year
21 will include the funding required to execute the
22 program without cancellation.

23 (C) The contract is a fixed-price type con-
24 tract.

1 (D) The proposed contract provides for
2 production at not less than minimum economic
3 rates given the existing tooling and facilities.

4 (E) The Secretary has determined that
5 each of the conditions described in subpara-
6 graphs (A) through (F) of paragraph (3) will be
7 met by such contract and has provided the
8 basis for such determination to the congres-
9 sional defense committees.

10 (F) The determination under subpara-
11 graph (E) was made after the completion of a
12 cost analysis performed by the Director of Cost
13 Assessment and Program Evaluation for the
14 purpose of section 2334 of title 10, United
15 States Code, and the analysis supports that de-
16 termination.

17 (5) EXCEPTION.—Notwithstanding paragraph
18 (4), the Secretary of Defense may enter into a con-
19 tract under paragraph (1) on or after March 1,
20 2020, if—

21 (A) the Director of Cost Assessment and
22 Program Evaluation has not completed a cost
23 analysis of the preliminary findings made by
24 the Secretary under paragraph (3) with respect
25 to the contract;

1 (B) the Secretary certifies to the congres-
2 sional defense committees, in writing, that each
3 of the conditions described in subparagraphs
4 (A) through (E) of paragraph (4) is satisfied;
5 and

6 (C) a period of 30 days has elapsed fol-
7 lowing the date on which the Secretary submits
8 the certification under subparagraph (B).

9 (b) BUY-TO-BUDGET ACQUISITION.—Subject to sec-
10 tion 2308 of title 10, United States Code, using funds au-
11 thorized to be appropriated by this Act for the procure-
12 ment of F-35 aircraft, the Secretary of Defense may pro-
13 cure a quantity of F-35 aircraft in excess of the quantity
14 authorized by this Act if such additional procurement does
15 not require additional funds to be authorized to be appro-
16 priated because of production efficiencies or other cost re-
17 ductions.

1 **SEC. 1** [Log 69521]. **PROGRAM REQUIREMENTS FOR THE**
2 **F-35 AIRCRAFT PROGRAM.**

3 (a) DESIGNATION OF MAJOR SUBPROGRAM.—In ac-
4 cordance with section 2430a of title 10, United States
5 Code, the Secretary of Defense shall designate F-35 Block
6 4 as a major subprogram of the F-35 aircraft program.

7 (b) COST ESTIMATES.—

8 (1) JOINT COST ESTIMATE.—The Secretary of
9 the Air Force and the Secretary of the Navy shall
10 jointly develop a joint service cost estimate for the
11 life-cycle costs of the F-35 aircraft program.

12 (2) INDEPENDENT COST ESTIMATE.—The Di-
13 rector of Cost Assessment and Program Evaluation
14 shall develop an independent cost estimate for the
15 life-cycle costs of the F-35 aircraft program.

16 (3) SUBMITTAL TO CONGRESS.—The cost esti-
17 mates required under paragraphs (1) and (2) shall
18 be submitted to the congressional defense commit-
19 tees not later than 180 days after the date of the
20 enactment of this Act.

21 (c) REVISION OF PROGRAM ELEMENTS.—

22 (1) REVISION REQUIRED.—The Secretary of
23 Defense shall revise the program elements applicable
24 to the F-35 aircraft program as follows:

1 (A) RESEARCH AND DEVELOPMENT.—The
2 program element for research and development
3 costs (as that element was specified in the ma-
4 terials submitted to Congress by the Secretary
5 of Defense in support of the budget of the
6 President for fiscal year 2020 (as submitted to
7 Congress under section 1105(a) of title 31,
8 United States Code)) shall be separated into
9 the following individual program elements:

10 (i) System development and dem-
11 onstration closeout.

12 (ii) F-35 Block 4.

13 (iii) Autonomic logistics information
14 system development and upgrades.

15 (iv) Dual-capable aircraft.

16 (v) Test infrastructure.

17 (vi) Additional program budget ele-
18 ments, as required, for each modernization
19 or upgrade effort initiated after F-35
20 Block 4.

21 (B) PROCUREMENT.—The program ele-
22 ment for procurement costs (as that element
23 was specified in the materials submitted to Con-
24 gress by the Secretary of Defense in support of
25 the budget of the President for fiscal year 2020

1 (as submitted to Congress under section
2 1105(a) of title 31, United States Code)) shall
3 be separated into the following individual pro-
4 gram elements:

5 (i) Recurring fly-away and ancillary
6 equipment.

7 (ii) Non-recurring fly-away and ancil-
8 lary equipment.

9 (iii) F-35 Block 4.

10 (iv) Autonomic logistics information
11 system.

12 (v) Dual-capable aircraft.

13 (vi) Engineering support.

14 (vii) Aircraft retrofit and modifica-
15 tion.

16 (viii) Depot activation.

17 (ix) Initial spares.

18 (x) Production support.

19 (2) INCLUSION IN BUDGET MATERIALS.—The
20 Secretary of Defense shall ensure that each revised
21 program element described in paragraph (1) is in-
22 cluded, with a specific dollar amount, in the mate-
23 rials relating to the F-35 aircraft program sub-
24 mitted to Congress by the Secretary of Defense in
25 support of the budget of the President (as submitted

1 to Congress under section 1105(a) of title 31,
2 United States Code) for fiscal year 2021 and each
3 fiscal year thereafter until the date on which the F-
4 35 aircraft program terminates.

5 (d) COMPTROLLER GENERAL REPORTS.—

6 (1) ANNUAL REPORT REQUIRED.—Not later
7 than 30 days after the date on which the budget of
8 the President is submitted to Congress under section
9 1105(a) of title 31, United States Code, for each of
10 fiscal years 2021 through 2025, the Comptroller
11 General of the United States shall submit to the
12 congressional defense committees a report on the F-
13 35 aircraft program.

14 (2) ELEMENTS.—Each report under paragraph
15 (1) shall include, with respect to the F-35 aircraft
16 program, the following:

17 (A) An assessment of the progress of man-
18 ufacturing processes improvement under the
19 program.

20 (B) The business case analysis of the De-
21 partment of Defense for F-35 Block 4 follow-
22 on modernization efforts.

23 (C) The progress and results of F-35
24 Block 4 and other follow-on modernization de-
25 velopment and testing efforts.

1 (D) The Department's schedule for deliv-
2 ering software upgrades in six-month, scheduled
3 increments.

4 (E) The progress and results of any other
5 significant hardware development and fielding
6 efforts necessary for F-35 Block 4.

7 (F) Any other issues the Comptroller Gen-
8 eral determines to be appropriate.

9 (e) F-35 BLOCK 4 DEFINED.—In this section, the
10 term “F-35 Block 4” means Block 4 capability upgrades
11 for the F-35 aircraft program as described in the Selected
12 Acquisition Report for the program submitted to Congress
13 in March 2019, pursuant to section 2432 of title 10,
14 United States Code.

1 **SEC. 1** **[Log 69523]. REPORTS ON F-35 AIRCRAFT PRO-**
2 **GRAM.**

3 (a) REPORT ON F-35 RELIABILITY AND MAINTAIN-
4 ABILITY METRICS.—The Secretary of Defense shall sub-
5 mit to the congressional defense committees a report on
6 the reliability and maintainability metrics for the F-35
7 aircraft. The report shall include the following:

8 (1) The results of a review and assessment,
9 conducted by the program office for the F-35 air-
10 craft program, of the reliability and maintainability
11 metrics for the aircraft as set forth in the most re-
12 cent operational requirements document for the pro-
13 gram.

14 (2) A determination of whether the reliability
15 and maintainability metrics for the aircraft, as set
16 forth in the most recent operational requirements
17 document for the program, are feasible and attain-
18 able, and what changes, if any, will be made to up-
19 date the metrics.

20 (3) A certification that the program office for
21 the F-35 aircraft program has revised the reliability
22 and maintainability improvement plan for the air-
23 craft—

1 (A) to identify specific and measurable re-
2 liability and maintainability objectives in the
3 improvement plan guidance; and

4 (B) to identify and document which
5 projects included in the improvement plan will
6 achieve the objectives identified under subpara-
7 graph (A).

8 (b) REPORT ON F-35 BLOCK 4.—

9 (1) IN GENERAL.—The Secretary of Defense
10 shall submit to the congressional defense committees
11 a report on F-35 Block 4. The report shall include
12 the following:

13 (A) The results of an independent cost es-
14 timate for F-35 Block 4 conducted by the Di-
15 rector of Cost Assessment and Program Eval-
16 uation.

17 (B) A test and evaluation master plan, ap-
18 proved by the Director of Operational Test and
19 Evaluation, that addresses testing resources,
20 testing aircraft shortfalls, and testing funding.

21 (C) A technology readiness assessment of
22 all technologies and capabilities planned for F-
23 35 Block 4 conducted by the Under Secretary
24 of Defense for Research and Engineering.

1 (D) A review of the feasibility of the con-
2 tinuous capability development and delivery
3 strategy for fielding F-35 Block 4 technologies
4 conducted by the Under Secretary of Defense
5 for Research and Engineering.

6 (2) F-35 BLOCK 4 DEFINED.—In this sub-
7 section, the term “F-35 Block 4” has the meaning
8 given that term in [section ____ [Log 69521]].

9 (c) REPORT ON F-35 AUTONOMIC LOGISTICS INFOR-
10 MATION SYSTEM.—The Secretary of Defense shall submit
11 to the congressional defense committees a report on the
12 autonomic logistics information system of the F-35 air-
13 craft. The report shall include a description of each of the
14 following:

15 (1) All shortfalls, capability gaps, and defi-
16 ciencies in the system that have been identified as
17 of the date of the enactment of this Act.

18 (2) The strategy and performance requirements
19 that will be implemented to improve the system.

20 (3) The strategy, implementation plan, sched-
21 ule, and estimated costs of developing and fielding—

22 (A) the next generation of the system; or

23 (B) future increments of the system.

24 (d) DEADLINE FOR SUBMITTAL.—The reports re-
25 quired under subsections (a) through (c) shall be sub-

1 mitted to the congressional defense committees not later
2 than 180 days after the date of the enactment of this Act.

1 **SEC. 2** **[Log 69556]. DOCUMENTATION RELATING TO AD-**
2 **VANCED BATTLE MANAGEMENT SYSTEM.**

3 (a) DOCUMENTATION REQUIRED.—Not later than
4 the date specified in subsection (b), the Secretary of the
5 Air Force shall submit to the congressional defense com-
6 mittees the following documentation relating to the Ad-
7 vanced Battle Management System:

8 (1) A list that identifies each program, project,
9 and activity that comprises the System.

10 (2) The final analysis of alternatives for the
11 System.

12 (3) An acquisition strategy for the System, in-
13 cluding—

14 (A) an outline of each increment of the
15 System; and

16 (B) the date on which each increment will
17 reach initial operational capability and full
18 operational capability, respectively.

19 (4) A capability development document for the
20 System.

21 (5) An acquisition program baseline for the
22 System.

23 (6) A test and evaluation master plan for the
24 System.

1 (7) A life-cycle sustainment plan for the Sys-
2 tem.

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

5 (1) the date that is 180 days after the date on
6 which the final analysis of alternatives for the Ad-
7 vanced Battle Management System is completed; or

8 (2) April 1, 2020.

9 (c) ADVANCED BATTLE MANAGEMENT SYSTEM DE-
10 FINED.—In this section, the term “Advanced Battle Man-
11 agement System” means the Advanced Battle Manage-
12 ment System of Systems capability of the Air Force, in-
13 cluding each program, project, and activity that comprises
14 such capability.

1 **SEC. 2** ___ **[Log 69666]. SENSOR DATA INTEGRATION FOR**
2 **FIFTH GENERATION AIRCRAFT.**

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

5 (1) information collected by the passive and ac-
6 tive on-board sensors of the F-35 Joint Strike
7 Fighter aircraft is capable of being shared, in real
8 time, with joint service users in cases in which the
9 Joint Force Commander determines that sharing
10 such information would be operationally advan-
11 tageous; and

12 (2) the Secretary has developed achievable, ef-
13 fective, and suitable concepts and supporting tech-
14 nical architectures to collect, store, manage, and dis-
15 seminate information collected by such sensors.

16 (b) GAO STUDY AND REPORT.—

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

21 (2) ELEMENTS.—The study required by para-
22 graph (1) shall include an assessment of the fol-
23 lowing—

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

7 (B) the status of the existing sensor data
8 collection, storage, dissemination, and manage-
9 ment capability and capacity of fifth generation
10 aircraft, including the F-35, the F-22, and the
11 B-21; and

12 (C) the ability of the F-35 aircraft and
13 other fifth generation aircraft to share informa-
14 tion collected by the aircraft in real-time with
15 other joint service users as described in sub-
16 section (a)(1).

17 (3) STUDY RESULTS.—

18 (A) INTERIM BRIEFING.—Not later than
19 180 days after the date of the enactment of this
20 Act, the Comptroller General shall provide to
21 the congressional defense committees a briefing
22 on the preliminary findings of the study con-
23 ducted under this subsection.

24 (B) FINAL RESULTS.—The Comptroller
25 General shall provide the final results of the

1 study conducted under this subsection to the
2 congressional defense committees at such time
3 and in such format as is mutually agreed upon
4 by the committees and the Comptroller General
5 at the time of the briefing under subparagraph
6 (A).

- 1 (3) An assessment of the status of the program
- 2 with respect to—
- 3 (A) the development and approval of tech-
- 4 nical requirements;
- 5 (B) technological maturity;
- 6 (C) testing;
- 7 (D) delivery; and
- 8 (E) program management.

1 **SEC. 10** [Log 69482]. **ARMY AVIATION STRATEGIC PLAN**
2 **AND MODERNIZATION ROADMAP.**

3 (a) **STRATEGIC PLAN AND MODERNIZATION ROAD-**
4 **MAP.—**

5 (1) **IN GENERAL.—**The Secretary of the Army
6 shall develop a comprehensive strategic plan for
7 Army aviation, which shall be designed to—

8 (A) ensure the alignment between require-
9 ments, both current and future, and Army
10 budget submissions to meet such requirements;
11 and

12 (B) inform the preparation of future de-
13 fense program and budget requests by the Sec-
14 retary, and the consideration of such requests
15 by Congress.

16 (2) **ELEMENTS.—**The plan required by para-
17 graph (1) shall include the following:

18 (A) An assessment of all missions for
19 Army aviation, both current missions and those
20 missions necessary to support the national de-
21 fense strategy and the U.S. Army in Multi-Do-
22 main Operations 2028 concept.

1 (B) An analysis of platforms, capabilities,
2 and capacities necessary to fulfill such current
3 and future Army aviation missions.

4 (C) The required life cycle budget associ-
5 ated with each platform, capability, and capac-
6 ity requirement for both current and future re-
7 quirements.

8 (D) An analysis showing operational, budg-
9 et, and schedule trade-offs between sustainment
10 of currently-fielded capabilities, modernization
11 of currently-fielded capabilities, and develop-
12 ment and production of new capabilities.

13 (b) REPORT TO CONGRESS.—Not later than March
14 30, 2020, the Secretary of the Army shall submit to the
15 congressional defense committees a report containing—

16 (1) the comprehensive strategic plan required
17 by subsection (a); and

18 (2) a sustainment and modernization plan for
19 carrying out such strategic plan through fiscal year
20 2028.

1 **SEC. 10** [Log 69667]. **REPORT ON GROUND-BASED LONG-**
2 **RANGE ARTILLERY TO COUNTER LAND AND**
3 **MARITIME THREATS.**

4 (a) IN GENERAL.—Not later than March 1, 2020, the
5 Secretary of Defense shall submit to the Committees on
6 Armed Services of the Senate and House of Representa-
7 tives a report on the efforts by the Army and Marine
8 Corps to develop and deploy ground-based long-range
9 rocket and cannon artillery to counter land and maritime
10 threats.

11 (b) ELEMENTS.—The report required by subsection
12 (a) shall include each of the following:

13 (1) An assessment of ongoing and future Army
14 and Marine Corps efforts to develop and deploy
15 ground-based long-range rocket and cannon artillery
16 to counter land and maritime fires in the areas of
17 operations of United States Indo-Pacific Command
18 and United States European Command.

19 (2) An assessment of and recommendations for
20 how the Department of Defense can improve the de-
21 velopment and deployment of such artillery.

22 (3) An analysis and assessment of how such ar-
23 tillery employed in support of the Armed Forces of
24 the United States and allied forces would be de-

1 ployed, positioned, and controlled to operate effec-
2 tively against potential adversaries throughout the
3 depth of their tactical, operational, and strategic for-
4 mations, including any recommendations of the Sec-
5 retary regarding how such support could be en-
6 hanced.

7 (c) FORM OF REPORT.—The report required by sub-
8 section (a) shall be submitted in unclassified form, but
9 may contain a classified annex.

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DIVISION A—DEPARTMENT OF DEFENSE AUTHORIZATIONS

TITLE I—PROCUREMENT

AIRCRAFT PROCUREMENT, ARMY

Items of Special Interest

UH-72A Light Utility Helicopter

The committee understands the UH-72A Lakota helicopter provides general aviation support for aviation units in the Active and Reserve Components. The committee supports the requirement to conduct mid-life sustainment and product improvement activities for the UH-72A, and supports funding to conduct the analysis, engineering, certification, and risk reduction activities necessary to update the UH-72A Life Cycle Support Plan. The committee also recognizes that the UH-72A was initially fielded without aircraft survivability equipment, which could potentially limit the Active Component and Army National Guard utilization of the UH-72A platform. As reflected in division D of this Act, the committee recommends additional funding for the National Guard and Reserve Component Equipment Account (NGREA). The committee understands that while no requirements have been formally identified for UH-72A Lakota ballistic armor or aircraft survivability equipment by the National Guard Bureau, should a requirement be put forth, the committee expects the Army National Guard to utilize NGREA funds.

The committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by February 1, 2020, on the Army's long-term sustainment strategy for the UH-72A Lakota helicopter fleet.

MISSILE PROCUREMENT, ARMY

Items of Special Interest

Indirect Fire Protection Capability Increment 2 system of systems

The committee understands that the Indirect Fire Protection Capability Increment 2 system of systems (IFPC Inc 2) is a mobile, ground-based weapon system intended to defend fixed and semi-fixed sites and address numerous capability gaps for cruise missile defense (CMD), counter-unmanned aerial systems (C-UAS), and counter-rocket, artillery, and mortar (C-RAM). The committee notes that since March 2018, the Army has evaluated existing air defense systems in order to rapidly acquire and field an interim capability while concurrently evaluating solutions for an enduring IFPC Inc 2 system to meet the full spectrum of requirements and threats. The committee understands that based on the Army's analysis of cost, schedule, and performance, as well as the fielding requirements for

an interim CMD capability required by section 112 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115-232), the Army will field two interim IFPC batteries of Iron Dome in fiscal year 2020, while concurrently developing and evaluating a launcher and interceptor solution for an enduring IFPC capability.

The committee supports the Army's IFPC system acquisition strategy, including the immediate procurement of two Iron Dome batteries to meet the statutory schedule requirements for an interim capability. The committee encourages the Army to continue with current experimentation plans for the enduring IFPC system to better understand the complexity of integration of potential launcher and interceptor solutions. Accordingly, the committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by November 1, 2019, on the progress of fielding an Iron Dome interim IFPC system for CMD, as well as an update on the status of development of an enduring capability for IFPC Inc 2.

TOW 2B missile system

The committee is aware that the Army is developing the next version of its TOW 2B tactical missile system that will serve as the primary anti-armor weapon for the Optionally Manned Fighting Vehicle (OMFV) program. The committee also understands that the Army wants to accelerate development and fielding of the OMFV, but it is not clear that the development and fielding schedule for the new TOW 2B missile is aligned with the schedule for OMFV.

Accordingly, the committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by February 3, 2020, on the current plans for development and fielding of the TOW 2B missile, including how the Army will synchronize the availability of a new TOW 2B missile with fielding of the OMFV.

PROCUREMENT OF WEAPONS AND TRACKED COMBAT VEHICLES, ARMY

Items of Special Interest

Vehicle active protection systems

The committee understands the Army is working quickly to procure and field non-developmental item (NDI) vehicle active protection systems (V-APS) for combat and tactical vehicles to address immediate operational needs. The committee notes for example the Army will procure equipment sets of Trophy APS for installation on the M1 Abrams tanks of four armored brigades, including a brigade set for U.S. European Command's prepositioned stocks. While the committee supports the Army's NDI V-APS efforts and is encouraged by the successful testing, integration, and operational effectiveness of Trophy on Abrams tanks, the committee is concerned that the Army has no strategy to develop or

acquire training devices related to Trophy or other V-APS systems under consideration for the Bradley and Stryker armored vehicles.

The committee also understands the Army is concurrently developing an objective, long-term V-APS solution that would field an open architecture compliant V-APS system with other vehicle protection capabilities, and that current NDI V-APS systems, such as Trophy, are potential candidates for further development and integration. The committee expects the Army to benefit from the data collected during this expedited NDI V-APS effort to better inform their long-term strategy as well as look for ways to accelerate development and procurement.

Accordingly, the committee directs the Assistant Secretary of the Army for Acquisition, Logistics, and Technology to provide a briefing to the House Committee on Armed Services not later than November 29, 2019, on the requirements and acquisition strategy for both near-term and long-term V-APS efforts, including technology, schedule, and funding profiles associated with development and acquisition of training devices for the various V-APS being developed, installed, or planned for installation on combat and tactical vehicles. The briefing should also include courses of action for accelerating the development of the objective V-APS long-term solution and options for expanding the fielding of NDI APS solutions to additional current or future combat vehicles.

PROCUREMENT OF AMMUNITION, ARMY

Items of Special Interest

Army vertical lift munitions

The committee expects that the Army's future vertical lift systems will be equipped to operate successfully against peer and near-peer adversaries. Such systems will need new weapon capabilities and munitions that can effectively engage adversary targets from standoff ranges that are beyond line-of-sight or over-the-horizon. To be successful, these munitions must operate despite adversary technologies for jamming, spoofing, and GPS denial.

Therefore, the committee directs the Secretary of the Army to submit a report to the Committees on Armed Services of the Senate and the House of Representatives by February 1, 2020, on Army vertical lift munition range and operating environment capabilities gaps, if any, and potential developmental and off-the-shelf solutions associated with those gaps. The report shall include the following:

- (1) an identification and assessment of current U.S. vertical lift munition capabilities and capabilities gaps, if any, against near-peer adversaries;
- (2) an identification and assessment of U.S. and allied off-the-shelf and developmental solutions to meet these capability gaps, if any, including munitions that the United States has tested or will test;
- (3) an identification and assessment of any completed or planned testing of developmental munitions in calendar years 2019 and 2020, including: an

assessment of the effectiveness and suitability of the tested munitions; an assessment of whether the tested munitions could replace, supplement, or duplicate current capabilities; a comparison of the tested munitions capabilities to relevant currently fielded munitions; and plans, if any, to do a near-term fielding or operational evaluation of the tested munitions; and

(4) an estimate of the cost and schedule for the Army to develop and produce new capabilities, and acquire and field as an interim solution any existing capabilities that have been tested and would provide an acceptable solution for capability gaps.

M58 Mine Clearing Line Charge

The committee encourages the Army to accelerate modifications and upgrades to the M58 Mine Clearing Line Charge (MICLIC) system. The committee notes the current fielded MICLIC system has been operational since the 1970s and continues to be employed by the Army and Marine Corps. Furthermore, according to the report submitted to the committee by the Army, as required in the committee report accompanying the National Defense Authorization Act for Fiscal Year 2019 (H. Rept. 115-676), the MICLIC's system operational readiness rate is 73 percent, which is below the requirement of 78 percent. The committee also notes that employment success rates are only 50 percent based on data from units rotating through Combat Training Centers. The committee notes with concern that the MICLIC has not seen any significant upgrade in capability since its introduction, and does not meet the mission readiness and employment requirements.

The committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by November 1, 2019, on the Army's plan for upgrading or replacing the M58 MICLIC system. The briefing should include:

(1) the updated capability requirements for a solution that addresses the readiness and reliability concerns of the current MICLIC;

(2) a plan and timeline to upgrade the current system or field a newer variant; and

(3) a funding profile over time for costs associated with the research, development, test, and production of a new system.

OTHER PROCUREMENT, ARMY

Items of Special Interest

AN/PEQ-15 Pointer, Illuminator, Aiming Laser capability enhancement/upgrade strategy

The committee is aware of the Army's Soldier Lethality Cross-Functional Team's efforts to enhance the capability of the AN/PEQ-15 Pointer, Illuminator, Aiming Laser. The committee is concerned, however, that the AN/PEQ-15 is approaching obsolescence, is no longer under a formal sustainment program of

record, and is not optimized for use with the Army's new ENVG-B night vision device. A solution is needed that will provide a capability bridge until a new family of weapons sights is developed, tested, produced, and fielded. The committee is aware that the Army has tested a possible AN/PEQ-15 replacement through a limited user evaluation that distributed 700 test items to selected brigade combat teams. The committee supports the Army's rapid development and acquisition approach for such a bridge capability and directs the Assistant Secretary of the Army for Acquisition, Logistics, and Technology to provide a briefing to the House Committee on Armed Services not later than November 1, 2019, on the strategy for development and replacement of the AN/PEQ-15.

Global Positioning System denied environments

The committee recognizes the need to improve the capability of U.S. forces to operate in denied environments where access to the Global Positioning System (GPS) is not assured. Potential adversaries are using advanced air defense systems and GPS-jamming and spoofing systems to deny or disrupt U.S. forces access, information gathering, precision strike, and navigation.

The committee notes that section 1239 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115-91) required the Secretary of Defense to develop a strategy to counter this specific threat. The committee recognizes that the Department of Defense has made progress with GPS satellite-related GPS III and M-Code development. The committee is concerned, however, that U.S. forces should avoid becoming reliant on a single solution or technology, especially with increasing ground-based threats to satellites.

The committee is also concerned about an apparent capability gap in which current air-to-ground weapon programs do not provide adequate range or precision-strike capabilities needed for operating environments in which access to GPS is not assured. The committee encourages the Department of Defense to consider available off-the-shelf systems to meet this capability gap quickly.

Accordingly, the committee directs the Under Secretary of Defense for Acquisition and Sustainment to provide a briefing to the House Committee on Armed Services not later than November 1, 2019, on efforts, including developmental and non-developmental item acquisition programs, to address U.S. munition capability gaps for longer range systems operating in GPS-denied or -degraded environment.

AIRCRAFT PROCUREMENT, NAVY

Items of Special Interest

MH-53E modernization and sustainment strategy

The committee is concerned with the readiness and modernization trajectory of the Navy MH-53E fleet. Without sufficient resources and attention,

MH-53E readiness levels will continue to decline. The committee notes that the Marine Corps CH-53E reset program has improved readiness levels and that the Army has achieved similar success using similar reset programs for a variety of rotorcraft platforms. Therefore, the committee directs the Secretary of the Navy to provide a briefing to the House Committee on Armed Services not later than September 1, 2019, on the MH-53E fleet modernization and sustainment strategy. This briefing shall include an assessment of the feasibility and cost of reversing MH-53 readiness declines through a reset program similar to the Marine CH-53E reset program.

PROCUREMENT, DEFENSE-WIDE

Items of Special Interest

Mitigation of military aviation physiological incidents

The budget request for the Department of the Navy contained \$278.0 million to address physiological episode (PE) mitigation and repairs for the Naval Aviation Enterprise, and the total funding included in the 2020 to 2024 Future Years Defense Program for the Department of the Navy is \$788.4 million. The budget request for the Department of the Air Force contained \$6.9 million in PE64706F for life support systems to address physiological episode mitigation for the Air Force aviation enterprise. The committee understands the Air Force plans to request reprogramming authority during fiscal year 2019 to realign \$87.1 million for procurement of the Enhanced On-Board Oxygen Generation System for 445 T-6 training aircraft.

The committee commends the ongoing efforts of the Department of the Navy to address modifications to F/A-18 aircraft to mitigate PEs and notes that it has been designated as the number one safety priority to resolve within the Naval Aviation Enterprise. The committee notes these efforts include replacement of the F/A-18 cockpit altimeter; upgrade of the F/A-18 On-Board Oxygen Generation System (OBOGS); redesign of the F/A-18 aircraft life support systems required to meet OBOGS input specifications; and installation of equipment associated with improved F/A-18 physiological monitoring and alert systems.

The committee is aware that since approximately 2010, the Air Force has experienced increases in the rate of physiological episodes affecting aircrew in the F-22, F-15C, F-35A, and T-6A aircraft. The committee notes the Air Force Physiological Episodes Action Team assessed that for more than a decade, the Air Force has underinvested in basic aerospace physiology science, research, and development. While the Air Force has made progress in some areas of human-machine-environment interface during that time period, other areas were not as well studied, which left gaps in Air Force data resulting in limited understanding of aircrew life support requirements related to PE for aircrew flying high-performance tactical aircraft.

Therefore, the committee directs the Secretary of the Air Force, in consultation with the Secretary of the Navy, to provide a briefing to the House Committee on Armed Services not later than March 1, 2020, that determines the availability and feasibility of procuring PE sensor devices in pilot helmets that warn of imminent incapacitation and can also collect and report data on human performance during flight.

TITLE II—RESEARCH, DEVELOPMENT, TEST, AND EVALUATION

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, ARMY

Items of Special Interest

Accelerated integration to counter emerging threats

The committee supports the accelerated integration capability to counter emerging threats being initiated by the Program Executive Office, Missiles and Space. The Army is developing a Government-owned capability to provide cyber-robust, networked new missile capabilities into the Army Integrated Air and Missile Defense systems designed to operate within rapidly evolving threat environments and timelines. The committee understands this is being accomplished through a unique approach to adapt and respond to real-time threats, dramatically accelerating the timeline to employ resilience in networked weapon systems. Therefore, the committee directs the Secretary of the Army to provide a briefing to the Committee on Armed Services of the House of Representatives by March 2, 2020, on the status of progress being made through this accelerated program.

Carbon fiber wheels and graphitic foam for Army vehicles

The committee notes the evolution of the Army's testing and evaluation of Lightweight Metal Matrix Composite Technology as outlined in the report by the Assistant Secretary of the Army for Acquisition, Logistics, and Technology submitted to the congressional defense committees in accordance with the committee report accompanying the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (S. Rept. 115-262). The Army's report makes clear that its interest with respect to new materials for lightweight wheels and associated brake systems has transitioned to a more viable dual-use carbon fiber and graphite byproduct suitable for brake pads and liners throughout the tactical wheeled vehicle fleet.

The committee encourages the Army to continue to develop, prototype, and test affordable mesophase pitch carbon fiber and graphitic carbon foam components for the Next Generation Combat Vehicle and the tactical wheeled vehicle fleet to confirm their potential to reduce vehicle weight and improve fuel consumption and payload capacity over standard aluminum and steel designs. Accordingly, the

committee directs the Assistant Secretary of the Army for Acquisition, Logistics, and Technology to provide a briefing to the House Committee on Armed Services not later than November 29, 2019, on the progress of the Army's development and testing efforts related to mesophase pitch carbon fiber and graphitic carbon foam vehicle components.

Foamable celluloid material

The committee is aware that the Army has made investments and achieved progress in developing modern ammunition material and manufacturing technologies that have the potential to improve ammunition performance and reduce life-cycle costs. Given this progress, the committee encourages the Army to rapidly transition technologies when ready from development to production for operational use availability. For example, the committee understands there could be substantial performance improvement and cost savings derived from advanced technologies such as foamable celluloid combustible propellant cases for tank, artillery, and mortar ammunition. The committee, therefore, encourages the Army to complete the development and qualification of this new capability in order to make a timely production and fielding decision. Further, the committee directs the Assistant Secretary of the Army for Acquisition, Logistics, and Technology to provide a briefing to the House Committee on Armed Services not later than August 15, 2019, on plans for the continued development and potential for production and fielding of new ammunition technology, such as foamable celluloid combustible propellant cases, for tanks, artillery, and mortars.

Heavy Equipment Transporter System Trailer development

The committee encourages the Army to continue development and procurement of a Heavy Equipment Transporter (HET) Trailer solution for current and future combat vehicles. The committee notes that the Army's current trailer is rated for 70 tons, but modernized M1A2 Abrams Main Battle Tanks will weigh in excess of 80 tons. Given the gross vehicle weight limitations on current trailer systems, the committee is concerned that these trailers cannot transport the most modern version of the Abrams tank. The committee believes the Army requires a new, more capable trailer and therefore encourages the Army immediately to begin to plan, program, and fund the accelerated modification of fielded HET trailers. The committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by November 1, 2019, that details courses of action to accelerate needed modernization of current HET trailers.

Multi-mission Medium Range Railgun Weapon System and Integrated Power and Thermal Management System

The committee recognizes progress made by the Army to mature the multi-mission medium range railgun weapon system (MMRRWS) and the Integrated

Power and Thermal Management System (IPTMS). The committee understands that MMRRWS, if successful, would support integrated air missile defense, mobile short-range air defense, and indirect and direct fires applications. This capability would launch a guided projectile significantly farther and with more lethality than traditional systems, and will address critical gaps in U.S. air defense against growing threats from peer and near-peer competitors. The committee further understands IPTMS was developed specifically to support the Army's Maneuver-Short Range Air Defense (M-SHORAD) requirement. Adopting IPTMS could potentially accelerate development of a directed energy capable M-SHORAD capability as early as 2021. The committee encourages the Army to continue to leverage internal investments in developing MMRRWS and IPTMS in order to fully evaluate the potential of railgun technology on mobile platforms.

Therefore, the committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services not later than February 1, 2020, on the current capability of MMRRWS and IPTMS, ongoing development and technology maturation of these systems, the results of any technology demonstrations of these capabilities, and the integration of MMRWS and IPTMS and their components with existing or planned M-SHORAD systems.

National Academies review of technologies related to Army Strategic Long-Range Cannon

The committee notes that modernization of long-range precision fires is the Army's highest priority for meeting the requirements of the National Defense Strategy and the operational challenges associated with peer and near-peer potential adversaries. One of the technologies the Army is pursuing is a Strategic Long-Range Cannon capable of firing a projectile at hypersonic speed up to 1,000 miles. The committee is interested to learn more about this imaginative concept and the technical challenges associated with development of such a capability especially with respect to propellant, projectiles, and cannon. Accordingly, the committee directs the Secretary of the Army to enter into an arrangement with the Board on Army Research and Development of the National Academies of Sciences, Engineering, and Medicine to conduct a study that identifies and evaluates the technology approaches, policies, and concepts of operations of the Strategic Long-Range Cannon (SLRC) program. The study shall include:

- (1) an identification and evaluation of attributes of potential peer or near-peer adversaries operating environments and concepts that would enhance or reduce the effectiveness of SLRC;
- (2) an identification and evaluation of limitations and vulnerabilities of current ground-based capabilities for long-range fires as well as existing and proposed countermeasures;
- (3) an identification and evaluation of key and essential technologies needed to achieve documented goals and capabilities of SLRC along with associated technologies required to support manufacturability and sustainability; and

(4) provide a technology maturation roadmap, including an estimated funding profile over time, needed to achieve an effective operational SLRC that describes both the critical and associated supporting technologies, systems integration, prototyping and experimentation, and test and evaluation.

The Secretary shall submit the study to the congressional defense committees not later than August 31, 2020. The study submitted shall be classified at levels appropriate to and sufficient for access to data necessary for a comprehensive review of the subject and related technologies but must include an unclassified summary of findings and recommendations. The Secretary may submit comments, if any, to accompany the study's classified or unclassified findings and recommendations.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, AIR FORCE

Items of Special Interest

Digital twinning

The committee notes that "digital twin" technology has the ability to combine numerous technologies within a weapon system, such as the F-35 Joint Strike Fighter, to create a full-scale digital replica of the original weapon system. This digital replica could assist the Department of Defense in conducting predictive analyses to determine and more fully comprehend performance, reliability, and maintenance requirements before issues impact a weapon system's performance during development and manufacturing, or after the system is fielded.

Therefore, the committee directs the Secretary of Defense to provide a briefing to the House Committee on Armed Services not later than March 1, 2020, that explains how the F-35 program is implementing the use of digital twinning technology across the F-35 system enterprise.

Light attack and armed reconnaissance experimentation

The budget request contained \$35.0 million in PE27100F for continuation of Light-Attack Armed Reconnaissance (LAAR) experimentation.

The committee notes that the Air Force plans to apply \$100.0 million in fiscal year 2018 appropriated funding, and plans to request reprogramming authority to realign \$25.0 million in fiscal year 2019 appropriated funding, to purchase six test article LAAR platforms (three AT-6 and three A-29 aircraft) to continue Phase 3 experimentation activities.

The committee notes that the Air Force is not ready to make a decision on a potential procurement for LAAR without completing additional analyses on all potential solutions in order to find a solution that fits tactical, operational, and strategic requirements for a wide variety of allies and partners. The Air Force determined after the conclusion of Phase 2 experimentation that the results gained thus far have not provided enough information, nor has the LAAR experiment

strategy explored other platforms that could fill lesser contingency and international partner mission requirements. The committee further notes that the Air Force believes continued experimentation during Phase 3 will allow for additional consideration of current and emerging unmanned, rotorcraft, and turbojet technologies to assess cost-effectiveness and capability sufficiency to ensure that a future LAAR platform or platforms will maximize meeting a diverse set of mission requirements and capability gaps.

The committee appreciates the deliberate and methodical approach the Secretary of the Air Force is taking through experimentation and data analysis to fully inform a future procurement decision for LAAR capabilities and this new mission area. However, prior to entering Phase 3 experimentation activities, the committee expects the Secretary to establish and document the Phase 3 experimentation strategy, design, goals, objectives, and metrics. The committee also expects the Secretary to consult with the Commander, Special Operations Command to assess how both general purpose forces and special operations forces can leverage experimentation activities. The committee directs the Secretary of the Air Force to provide a briefing to the House Committee on Armed Services not later than September 1, 2019, on the scope and plans for Phase 3 experimentation.

OC-135B Open Skies Treaty aircraft recapitalization

The committee notes that the current fleet of OC-135B aircraft conducting the Open Skies Treaty flights are over 55 years old and experience significant sustainment and reliability issues, resulting in an average mission completion rate of 65 percent between 2007 and 2017. Further, the range of the legacy OC-135 aircraft is insufficient to fully execute mission options within the treaty's 96-hour in-country observation period. In addition to maintenance and range limitations, the current wet-film imaging used to collect data will become obsolete sometime around 2022. To avoid any gap in Open Skies Treaty collection capability, the committee supports the Air Force's plan to upgrade the fleet with digital visual imaging systems (DVIS) for the near-term, and ultimately replace the OC-135 Open Skies aircraft with two commercially-available small airliner class aircraft with integrated DVIS sensors.

The committee supports recapitalization of the OC-135 but remains concerned about the Air Force's ability to stay on schedule and meet the fiscal year 2022 aircraft certification and treaty compliance date. Unanticipated technical challenges with the DVIS sensors have already affected the schedule and could cause additional delays if not remedied soon.

Therefore, the committee directs the Secretary of the Air Force to provide a report to the House Committee on Armed Services by October 1, 2019, on the Open Skies Treaty aircraft recapitalization. The report shall include:

- (1) an assessment of the DVIS data technical package maturity and the cost and feasibility of integrating it onto the replacement commercial aircraft;

(2) the plan for and status of developing or acquiring associated ground processing systems;

(3) the plan for management of programmatic risk and an assessment of the ability to meet the fiscal year 2022 deadline for an upgraded, treaty-compliant system;

(4) existing or planned mitigation options should the Air Force not be able to achieve current DVIS and treaty compliance milestones, and should there be any future delay to the upgrade or replacement of the OC-135; and

(5) a copy of any assessment conducted by an independent organization employed by the program for technical assistance.

Wide area motion imagery

The committee notes that the Gorgon Stare wide area surveillance capability continues to support daily operations in both Afghanistan and Iraq with critical intelligence, surveillance, and reconnaissance (ISR), and that other combatant commands have requested the Gorgon Stare capability. The committee is concerned that, despite daily operational tasking and despite the Air Force's designation of Gorgon Stare as a program of record in 2014, there is still no formal budget request for this combat-proven ISR system. The committee notes that prior year congressional funding has resulted in the system developing beyond line-of-sight communications and multi-intelligence capabilities.

Accordingly, the committee directs the Chairman of the Joint Chiefs of Staff to provide a briefing to the House Committee on Armed Services by November 1, 2019, on the plan for apportionment of Gorgon Stare into the Department's ISR forces and the full extent of combatant command requirements for Gorgon Stare ISR wide-area support to worldwide operations.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, DEFENSE-WIDE

Items of Special Interest

Hybrid and electric air vehicle power and propulsion systems

The committee understands that hybrid and electric power and propulsion systems and vehicles hold the potential to significantly increase range and endurance for military aviation. The committee believes such aviation capabilities could support the National Defense Strategy. The Department of Defense requires a process to certify airworthiness to allow flight testing of these systems. However, the committee notes that the Department lacks adequate design, test, and certification procedures and facilities for aviation-purposed electric motors, motor controllers, traction bus systems, and large primary power battery systems. The committee is concerned that without a certification process in place, the military may miss the opportunity to capitalize on these advanced systems to reduce logistical requirements and costs.

Therefore, the committee directs the Secretary of Defense to provide a report to the House Committee on Armed Services by February 1, 2020, on establishing procedures and facilities for airworthiness certification of hybrid and electric power and propulsion aviation systems. The report should include estimated cost and schedule to implement a certification process.

Military rotorcraft safety

The committee recognizes that military rotorcraft operate in hazardous conditions using special tactics, techniques, and procedures that can lead to increased risk for pilots and their crews. The committee is aware of the significant risk that uncharted wires and obstacles pose to military rotorcraft, especially those flown by special operations forces and combat search and rescue elements. The committee also notes that military rotorcraft face safety and readiness challenges stemming from excessive aircraft vibration. The committee further understands that current vibration mitigation efforts often seek to mask or absorb vibrations without resulting in an actual decrease in vibration. The committee is concerned that there is insufficient focus on developing and fielding effective technology for detecting uncharted wires and obstacles, as well as insufficient focus on developing materiel solutions to help mitigate excessive vibration in legacy rotorcraft platforms.

The committee directs the Secretary of Defense, in coordination with the Secretaries of the Army, Navy, and Air Force, to provide a briefing to the House Committee on Armed Services by February 1, 2020, on Department-wide efforts to identify, develop, and procure capabilities related to the detection and avoidance of uncharted wires and obstacles, as well as efforts to mitigate excessive vibration in rotorcraft. The briefing should include to the maximum extent practicable an evaluation of current commercially available systems for obstacle detection and analysis of any tools, processes, software, or methodologies currently being evaluated towards mitigating vibration levels.

Tactical data links

The committee remains concerned with the lack of a Department of Defense-wide, comprehensive effort to achieve a resilient and survivable network for 5th and 4th generation systems data sharing in a highly contested operational environment. Section 234 of the National Defense Authorization Act for Fiscal Year 2018 (Public Law 115–91) directed the then-Under Secretary of Defense for Acquisition, Technology, and Logistics to coordinate with the Secretary of the Navy and the Secretary of the Air Force to develop a competitive acquisition plan for low probability of detection/low probability of intercept (LPD/LPI) datalink network capability. The committee notes, however, that the Department's plan was not sufficient or comprehensive.

The National Defense Strategy's shift to peer and near-peer threats requires joint force capabilities for operations in highly contested environments.

The F-22 and the F-35 aircraft possess LPD/LPI datalinks, but their two systems, the Intra-Flight Data Link and the Multifunction Advanced Data Link (MADL), cannot share information between aircraft. The Department identified F-35's MADL as the preferred airborne datalink to meet the requirement, but the associated form, fit, and function changes required rendered this unaffordable and the effort was cancelled. Additionally, the Air Force's concept for an Advanced Battle Management System (ABMS) for battle management and command and control (BMC2) also depends upon LPD/LPI datalinks to exchange intelligence, surveillance, and reconnaissance (ISR) and BMC2 information between current and future sensor network nodes.

The committee believes LPD/LPI networked communications must be a priority, and therefore, directs the Under Secretary of Defense for Acquisition and Sustainment, in coordination with the Secretaries of the Air Force and Navy, to provide a report to the congressional defense committees by December 1, 2019, on plans to ensure LPD/LPI communications among and between 5th and 4th generation airborne platforms as well as other network nodes for command, control, communications, and intelligence, surveillance, and reconnaissance. The report shall include:

- (1) all current and planned LPD/LPI data link developments, with requirements, technology specifications and readiness levels, and applicability to specific platforms and network-enabled weapon systems;
- (2) a plan and schedule for flight testing the data links in operationally relevant environments; and,
- (3) estimated cost and schedule to implement each solution.