

**H.R. 4350—FY22 NATIONAL DEFENSE
AUTHORIZATION BILL**

**SUBCOMMITTEE ON STRATEGIC
FORCES**

SUMMARY OF BILL LANGUAGE.....	1
BILL LANGUAGE.....	6
DIRECTIVE REPORT LANGUAGE	24

SUMMARY OF BILL LANGUAGE

Table Of Contents

DIVISION A—DEPARTMENT OF DEFENSE AUTHORIZATIONS TITLE XVI—SPACE ACTIVITIES, STRATEGIC PROGRAMS, AND INTELLIGENCE MATTERS

LEGISLATIVE PROVISIONS

SUBTITLE A—SPACE ACTIVITIES

Section 16XX—Report on Range of the Future Initiative of the Space Force

SUBTITLE C—NUCLEAR FORCES

Section 16XX—Exercises of Nuclear Command, Control, and Communications System

Section 16XX—Independent Review of Nuclear Command, Control, and Communications System

SUBTITLE D—MISSILE DEFENSE PROGRAMS

Section 16XX—Guam Integrated Air and Missile Defense System

Section 16XX—Notification of Changes to Non-Standard Acquisition and Requirements Processes and Responsibilities of Missile Defense Agency

Section 16XX—Directed Energy Programs for Ballistic and Hypersonic Missile Defense

DIVISION C—DEPARTMENT OF ENERGY NATIONAL SECURITY AUTHORIZATIONS AND OTHER AUTHORIZATIONS

TITLE XXXI—DEPARTMENT OF ENERGY NATIONAL SECURITY PROGRAMS

LEGISLATIVE PROVISIONS

SUBTITLE B—PROGRAM AUTHORIZATIONS, RESTRICTIONS, AND LIMITATIONS

Section 31XX—Improvements to Annual Reports on Condition of the United States Nuclear Stockpile

TITLE XXXII—DEFENSE NUCLEAR FACILITIES SAFETY BOARD

LEGISLATIVE PROVISIONS

Section 32XX—Technical Amendments regarding Chair and Vice Chair of Defense Nuclear Facilities Safety Board

DIVISION A—DEPARTMENT OF DEFENSE AUTHORIZATIONS

TITLE XVI—SPACE ACTIVITIES, STRATEGIC PROGRAMS, AND INTELLIGENCE MATTERS

LEGISLATIVE PROVISIONS

SUBTITLE A—SPACE ACTIVITIES

Section 16XX—Report on Range of the Future Initiative of the Space Force

This section would express the sense of Congress regarding the importance of improving infrastructure on U.S. Space Force launch ranges to meet future demand. The section would also require the Chief of Space Operations to submit a report to the congressional defense committees on the Space Force "Range of the Future" initiative, specific legal authorities that would need to be changed to address long-term challenges to the long-term physical infrastructure at U.S. Space Force launch ranges, and any proposals to further improve infrastructure at the ranges, including legislative action needed to implement those proposals.

SUBTITLE C—NUCLEAR FORCES

Section 16XX—Exercises of Nuclear Command, Control, and Communications System

This section would require the President to participate in at least one large-scale nuclear command, control, and communications exercise within the first year of assuming office, per term, and would include waiver authority on a case-by-case basis.

Section 16XX—Independent Review of Nuclear Command, Control, and Communications System

This section would require the Secretary of Defense to enter into an agreement with the National Academies of Sciences, Engineering, and Medicine to conduct a review of the current plans, policies, and programs of the nuclear command, control, and communications system, and such plans, policies, and programs that are planned through 2030. This section also would require an interim briefing on the review not later than September 1, 2022.

SUBTITLE D—MISSILE DEFENSE PROGRAMS

Section 16XX—Guam Integrated Air and Missile Defense System

This section would require the Secretary of Defense to identify an architecture and acquisition approach for an integrated air and missile defense system to protect the territory of Guam from cruise, ballistic, and hypersonic missile threats. The section would further require the architecture to address certain technical requirements, including sensor and command and control attributes, in addition to leveraging existing systems to the extent possible, including the ability to be upgradable in the future, and incentivizing competition where appropriate. In addition to the identification of an architecture and acquisition approach, the section would require the Secretary of Defense to submit a report on the Guam Integrated Air and Missile Defense System not later than 60 days after the date of the enactment of this Act.

Section 16XX—Notification of Changes to Non-Standard Acquisition and Requirements Processes and Responsibilities of Missile Defense Agency

This section would prohibit the Secretary of Defense from making any changes to the Missile Defense Agency non-standard acquisition and requirements processes until certain conditions were met including consulting with several offices within the Department of Defense, providing a certification and report to the congressional defense committees detailing the intended changes, and waiting 120 days after submission of the aforementioned report before implementing any changes.

Section 16XX—Directed Energy Programs for Ballistic and Hypersonic Missile Defense

This section would provide findings that there are promising directed energy technologies for ballistic and hypersonic defense applications, and that those efforts have consistently not been funded in the Missile Defense Agency budget for the past several fiscal year budget requests, despite continued support from yearly appropriation and authorization bills. The section would also express the sense of Congress that these efforts should continue within the Missile Defense Agency for potential future hypersonic and ballistic missile defense capabilities. Finally, the section would provide authority to the Secretary of Defense to delegate to the Director of the Missile Defense Agency the authority to budget for, direct, and manage directed energy programs applicable for ballistic and hypersonic missile defense.

**DIVISION C—DEPARTMENT OF ENERGY NATIONAL
SECURITY AUTHORIZATIONS AND OTHER
AUTHORIZATIONS**

**TITLE XXXI—DEPARTMENT OF ENERGY NATIONAL SECURITY
PROGRAMS**

LEGISLATIVE PROVISIONS

SUBTITLE B—PROGRAM AUTHORIZATIONS, RESTRICTIONS, AND LIMITATIONS

**Section 31XX—Improvements to Annual Reports on Condition of the United States
Nuclear Stockpile**

This section would modify section 4205(e)(3) of the Atomic Energy Defense Act (50 U.S.C. 2525(e)(3)) to include a review of the cybersecurity of the U.S. nuclear stockpile as part of the annual assessment of the nuclear weapons stockpile.

TITLE XXXII—DEFENSE NUCLEAR FACILITIES SAFETY BOARD

LEGISLATIVE PROVISIONS

**Section 32XX—Technical Amendments regarding Chair and Vice Chair of Defense
Nuclear Facilities Safety Board**

This section would change the title of the Chairman of the Defense Nuclear Facilities Safety Board from Chairman to Chair.

BILL LANGUAGE

1 **SEC. 16** ____ **.[Log 73365] REPORT ON RANGE OF THE FUTURE**
2 **INITIATIVE OF THE SPACE FORCE.**

3 (a) FINDINGS.—Congress finds that in a report sub-
4 mitted to Congress by the Chief of Space Operations, the
5 Chief highlighted a need for changes to current law to im-
6 prove installation infrastructure at the launch ranges of
7 the Space Force, and stated that “If we fail to do this
8 effectively our installations will become a limiting factor
9 to launch capability.”.

10 (b) REPORT.—Not later than 90 days after the date
11 of the enactment of this Act, the Chief of Space Oper-
12 ations shall submit to the congressional defense commit-
13 tees a report containing the following:

14 (1) A detailed plan to carry out the Space
15 Force “Range of the Future” initiative, including
16 the estimated funding required to implement the
17 plan.

18 (2) Identification of any specific authorities the
19 Chief determines need to be modified by law to im-
20 prove the ability of the Space Force to address long-
21 term challenges to the physical infrastructure at the
22 launch ranges of the Space Force, and an expla-
23 nation for why such modified authorities are needed.

1 (3) Any additional proposals that would support
2 improved infrastructure at the launch ranges of the
3 Space Force, including recommendations for legisla-
4 tive action to carry out such proposals.

1 **SEC. 16** ____ **.[Log 73067] EXERCISES OF NUCLEAR COMMAND,**
2 **CONTROL, AND COMMUNICATIONS SYSTEM.**

3 (a) REQUIREMENT.—Chapter 24 of title 10, United
4 States Code, is amended by adding at the end the fol-
5 lowing new section:

6 **“§ 499b. Exercises of nuclear command, control, and**
7 **communications system**

8 “(a) REQUIRED EXERCISES.—Except as provided by
9 subsection (b), beginning 2022, the President shall partici-
10 pate in a large-scale exercise of the nuclear command, con-
11 trol, and communications system during the first year of
12 each term of the President, and may participate in such
13 additional exercises as the President determines appro-
14 priate.

15 “(b) WAIVER.—The President may waive, on a case-
16 by-case basis, the requirement to participate in an exercise
17 under subsection (a) if the President—

18 “(1) determines that participating in such an
19 exercise is infeasible by reason of a war declared by
20 Congress, a national emergency declared by the
21 President or Congress, a public health emergency
22 declared by the Secretary of Health and Human
23 Services under section 319 of the Public Health

1 Service Act (42 U.S.C. 247d), or other similar exi-
2 gent circumstance; and

3 “(2) submits to the congressional defense com-
4 mittees a notice of the waiver and a description of
5 such determination.”.

6 (b) CLERICAL AMENDMENT.—The table of sections
7 at the beginning of such chapter is amended by adding
8 at the end the following new item:

“499b. Exercises of nuclear command, control, and communications system.”.

1 **SEC. 16** .**[Log 73068] INDEPENDENT REVIEW OF NU-**
2 **CLEAR COMMAND, CONTROL, AND COMMU-**
3 **NICATIONS SYSTEM.**

4 (a) REVIEW.—Not later than 30 days after the date
5 of the enactment of this Act, the Secretary of Defense
6 shall seek to enter into an agreement with the National
7 Academies of Sciences, Engineering, and Medicine under
8 which the National Academies shall conduct a review of
9 the current plans, policies, and programs of the nuclear
10 command, control, and communications system, and such
11 plans, policies, and programs that are planned through
12 2030.

13 (b) MATTERS INCLUDED.—The review under sub-
14 section (a) shall include a review of each of the following:

15 (1) The plans, policies, and programs described
16 in such subsection.

17 (2) The programmatic challenges and risks to
18 the nuclear command, control, and communications
19 system.

20 (3) Emerging technologies and how such tech-
21 nologies may be applied to the next generation of the
22 nuclear command, control, and communications sys-
23 tem.

1 (4) The security and surety of the nuclear com-
2 mand, control, and communications system.

3 (5) Threats to the nuclear command, control,
4 and communications system that may occur through
5 2030.

6 (c) BRIEFING.—Not later than September 1, 2022,
7 the Secretary shall provide the congressional defense com-
8 mittees an interim briefing on the review under subsection
9 (a).

10 (d) REPORT.—Not later than March 1, 2023, the Na-
11 tional Academies shall submit to the Secretary and the
12 congressional defense committees a report containing the
13 review under subsection (a).

1 **SEC. 16** ____ .**[Log 73362] GUAM INTEGRATED AIR AND MIS-**
2 **SILE DEFENSE SYSTEM.**

3 (a) **ARCHITECTURE AND ACQUISITION.**—The Sec-
4 retary of Defense shall identify the architecture and acqui-
5 sition approach for implementing a 360-degree integrated
6 air and missile defense capability to defend the people, in-
7 frastructure, and territory of Guam from advanced cruise,
8 ballistic, and hypersonic missile threats.

9 (b) **REQUIREMENTS.**—The architecture identified
10 under subsection (a) shall have the ability to—

11 (1) integrate numerous multi-domain sensors,
12 interceptors, and command and control systems
13 while maintaining high kill chain performance
14 against advanced threats;

15 (2) address robust discrimination and electro-
16 magnetic compatibility with other sensors;

17 (3) engage directly, or coordinate engagements
18 with other integrated air and missile defense sys-
19 tems, to defeat the spectrum of cruise, ballistic, and
20 hypersonic threats;

21 (4) leverage existing programs of record to ex-
22 pedite the development and deployment of the archi-
23 tecture during the five-year period beginning on the
24 date of the enactment of this Act, with an objective

1 of achieving initial operating capability in 2025, in-
2 cluding with respect to—

3 (A) the Aegis ballistic missile defense sys-
4 tem;

5 (B) standard missile-3 and -6 variants;

6 (C) the terminal high altitude area defense
7 system;

8 (D) the Patriot air and missile defense sys-
9 tem;

10 (E) the integrated battle control system;
11 and

12 (F) the lower tier air and missile defense
13 sensor and other lower tier capabilities, as ap-
14 plicable;

15 (5) integrate future systems and interceptors
16 that have the capability to defeat hypersonic missiles
17 in the glide and terminal phases, including integra-
18 tion of passive measures to protect assets in Guam;
19 and

20 (6) incentivize competition within the acquisi-
21 tion of the architecture and rapid procurement and
22 deployment wherever possible.

23 (c) REPORT.—Not later than 60 days after the date
24 of the enactment of this Act, the Secretary shall submit
25 to the congressional defense committees a report on the

- 1 architecture and acquisition approach identified under
- 2 subsection (a).

1 **SEC. 16** ____ .[Log 73421] **NOTIFICATION OF CHANGES TO**
2 **NON-STANDARD ACQUISITION AND REQUIRE-**
3 **MENTS PROCESSES AND RESPONSIBILITIES**
4 **OF MISSILE DEFENSE AGENCY.**

5 (a) NOTICE AND WAIT.—

6 (1) REQUIREMENT.—The Secretary of Defense
7 may not make any changes to the missile defense
8 non-standard acquisition and requirements processes
9 and responsibilities described in paragraph (2) until
10 the Secretary, without delegation, on or after the
11 date of the enactment of this Act—

12 (A) has consulted with the Under Sec-
13 retary of Defense for Research and Engineer-
14 ing, the Under Secretary of Defense for Acqui-
15 sition and Sustainment, the Under Secretary of
16 Defense for Policy, the Secretaries of the mili-
17 tary departments, the Chairman of the Joint
18 Chiefs of Staff, the Commander of the United
19 States Strategic Command, the Commander of
20 the United States Northern Command, and the
21 Director of the Missile Defense Agency;

22 (B) certifies to the congressional defense
23 committees that the Secretary has coordinated

1 the changes with, and received the views of, the
2 individuals referred to in subparagraph (A);

3 (C) submits to the congressional defense
4 committees a report that contains—

5 (i) a description of the changes, the
6 rationale for the changes, and the views of
7 the individuals referred to in subparagraph
8 (A) with respect to such changes; and

9 (ii) with respect to any such changes
10 to Department of Defense Directive
11 5134.09, a final draft of the proposed
12 modified directive, both in an electronic
13 format and in a hard copy format;

14 (D) with respect to any such changes to
15 Department of Defense Directive 5134.09, pro-
16 vides to such committees a briefing on the pro-
17 posed modified directive described in subpara-
18 graph (C)(ii); and

19 (E) a period of 120 days has elapsed fol-
20 lowing the date on which the Secretary submits
21 the report under subparagraph (C).

22 (2) NON-STANDARD ACQUISITION AND RE-
23 QUIREMENTS PROCESSES AND RESPONSIBILITIES
24 DESCRIBED.—The non-standard acquisition and re-
25 quirements processes and responsibilities described

1 in this paragraph are such processes and responsibil-
2 ities described in—

3 (A) the memorandum of the Secretary of
4 Defense titled “Missile Defense Program Direc-
5 tion” signed on January 2, 2002;

6 (B) Department of Defense Directive
7 5134.09, as in effect on the date of the enact-
8 ment of this Act; and

9 (C) United States Strategic Command In-
10 struction 538–3 titled “MD Warfighter Involve-
11 ment Process”.

12 (b) CONFORMING AMENDMENTS.—

13 (1) FY20 NDAA.—Section 1688 of the National
14 Defense Authorization Act for Fiscal Year 2020
15 (Public Law 116– 92; 133 Stat. 1787) is amended—

16 (A) by striking subsection (b); and

17 (B) by redesignating subsection (c) as sub-
18 section (b).

19 (2) FY21 NDAA.—Section 1641 of the William
20 M. (Mac) Thornberry National Defense Authoriza-
21 tion Act for Fiscal Year 2021 (Public Law 116–
22 283; 134 Stat. 4061) is amended—

23 (A) by striking subsection (c); and

24 (B) by redesignating subsection (d) as sub-
25 section (c).

1 **SEC. 16** ____ **.[Log 73517] DIRECTED ENERGY PROGRAMS FOR**
2 **BALLISTIC AND HYPERSONIC MISSILE DE-**
3 **FENSE.**

4 (a) FINDINGS.—Congress finds the following:

5 (1) In the fiscal year 2021 budget request of
6 the Department of Defense, the Secretary of De-
7 fense removed all funding from the Missile Defense
8 Agency to conduct research, engineering, or develop-
9 ment for directed energy technologies that could be
10 applicable for ballistic and hypersonic missile de-
11 fense, and this removal of funding continued in the
12 fiscal year 2022 budget request of the Department,
13 despite Congress appropriating funding for fiscal
14 year 2021 for these efforts.

15 (2) In January 2020, an independent Senior
16 Executive Review Team noted that “If successfully
17 developed, the unique features of diode pumped al-
18 kali laser, an efficient electrically powered, relatively
19 short wavelength gas laser with the potential to de-
20 liver megawatt power with near diffraction limited
21 beam quality from a single aperture would provide
22 the Department of Defense and the Missile Defense
23 Agency with an important strategic technology with
24 the potential for an attractive size, weight, and

1 power. Such a system would have potential capa-
2 bility use cases across all services/agencies.”. How-
3 ever, the Under Secretary of Defense for Research
4 and Engineering did not support continued inves-
5 tigation of this promising technology by the Missile
6 Defense Agency.

7 (3) In addition to diode pumped alkali lasers,
8 there are other directed energy applications that
9 have the potential to contribute to ballistic and
10 hypersonic missile defense architecture, including
11 microwave and short pulse lasers technologies.

12 (b) SENSE OF CONGRESS.—It is the sense of Con-
13 gress that the Director of the Missile Defense Agency
14 should continue to fund promising directed energy tech-
15 nologies for ballistic and hypersonic missile defense, in co-
16 ordination with the directed energy roadmap of the Under
17 Secretary of Defense for Research and Engineering, with
18 the intent to transfer technologies to the military depart-
19 ments as appropriate.

20 (c) AUTHORITY OF THE MISSILE DEFENSE AGEN-
21 CY.—

22 (1) DELEGATION.—The Secretary of Defense
23 shall delegate to the Director of the Missile Defense
24 Agency the authority to budget for, direct, and man-
25 age directed energy programs applicable for ballistic

1 and hypersonic missile defense missions, in coordina-
2 tion with other directed energy efforts of the De-
3 partment of Defense.

4 (2) PRIORITIZATION.—In budgeting for and di-
5 recting directed energy programs applicable for bal-
6 listic and hypersonic defensive missions pursuant to
7 paragraph (1), the Director of the Missile Defense
8 Agency shall—

9 (A) prioritize the early research and devel-
10 opment of technologies; and

11 (B) address the transition of such tech-
12 nologies to industry to support future oper-
13 ationally relevant capabilities.

1 **SEC. 31____.[Log 73329] IMPROVEMENTS TO ANNUAL RE-**
2 **PORTS ON CONDITION OF THE UNITED**
3 **STATES NUCLEAR WEAPONS STOCKPILE.**

4 Section 4205(e)(3) of the Atomic Energy Defense Act
5 (50 U.S.C. 2525(e)(3)) is amended—

6 (1) in subparagraph (A), by inserting “, includ-
7 ing with respect to cyber assurance,” after “meth-
8 ods”; and

9 (2) in subparagraph (B), by inserting “, and
10 the confidence of the head in,” after “adequacy of”.

1 **SEC. 32** . **[Log 73071] TECHNICAL AMENDMENTS REGARD-**
2 **ING CHAIR AND VICE CHAIR OF DEFENSE NU-**
3 **CLEAR FACILITIES SAFETY BOARD.**

4 Chapter 21 of the Atomic Energy Act of 1954 (42
5 U.S.C. 2286 et seq.) is amended—

6 (1) in section 311 (42 U.S.C. 2286)—

7 (A) in subsection (c)(4), by striking “the
8 office of Chairman” and inserting “the office of
9 the Chair”; and

10 (B) by striking “Chairman” each place it
11 appears (including in the heading of subsection
12 (c)) and inserting “Chair”; and

13 (2) in section 313 (42 U.S.C. 2286b), by strik-
14 ing “Chairman” each place it appears and inserting
15 “Chair”.

DIRECTIVE REPORT LANGUAGE

Table Of Contents

DIVISION A—DEPARTMENT OF DEFENSE AUTHORIZATIONS

TITLE XI—CIVILIAN PERSONNEL MATTERS

ITEMS OF SPECIAL INTEREST

- Prevention and Response Efforts in the National Nuclear Security Administration Nuclear Security Forces regarding Sexual Assault

TITLE XVI—SPACE ACTIVITIES, STRATEGIC PROGRAMS, AND INTELLIGENCE MATTERS

ITEMS OF SPECIAL INTEREST

SPACE ACTIVITIES

- Alternate Global Positioning System Constellation
- Commercial Cloud for Military Space Programs
- Commercial Imagery Capabilities
- Commercial Radio Frequency Capabilities
- Commercial Space Situational Awareness

MISSILE DEFENSE PROGRAMS

- Layered Defense for the Homeland
- Leveraging AN/TPY-2 Radar Foreign Military Sales for U.S. Programs

NUCLEAR FORCES

- Cybersecurity Requirements in the Nuclear Modernization Life Cycle

OTHER MATTERS

- Testing Infrastructure to Support Strategic and Missile Defense Programs

DIVISION C—DEPARTMENT OF ENERGY NATIONAL SECURITY AUTHORIZATIONS AND OTHER AUTHORIZATIONS

TITLE XXXI—DEPARTMENT OF ENERGY NATIONAL SECURITY PROGRAMS

ITEMS OF SPECIAL INTEREST

- Briefing on Capabilities, Plans, and Strategy with regard to Artificial Intelligence, Machine Learning, and Data Science
- Comptroller General Review of Insider Threats to the Nuclear Security Enterprise
- Comptroller General Review of the Enhanced Capability for Subcritical Experiments Program
- Independent Review Team Report on the B61-12 Life Extension Program and W88 Alteration 370 Technical Issue
- Sustaining and Improving Monitoring, Detection, and Verification Test Bed Capabilities

DIVISION A—DEPARTMENT OF DEFENSE AUTHORIZATIONS

TITLE XI—CIVILIAN PERSONNEL MATTERS

ITEMS OF SPECIAL INTEREST

Prevention and Response Efforts in the National Nuclear Security Administration Nuclear Security Forces regarding Sexual Assault

The committee commends the work of the Comptroller General of the United States in reviewing the National Nuclear Security Administration's (NNSA's) policies, programs, and responses to preventing sexual assault in NNSA's security forces and its recent report (GAO-21-307). The committee further commends the Secretary of Energy's commitment to implementing the Comptroller General's recommendations in this regard. Ensuring that all Federal employees and contractors of the NNSA are able to serve the nuclear enterprise without fear of harassment is a national security issue, in addition to one of workplace rights. Therefore, the committee directs the Administrator of the National Nuclear Security Administration to provide a briefing to the House Committee on Armed Services not later than January 15, 2022, on implementing the Comptroller General report's recommendations. The briefing should include:

- (1) a plan to fully implement the report's recommendations;
- (2) progress toward implementing the report's recommendations;
- (3) options available to the Department of Energy to penalize contractors for not upholding their obligations regarding sexual assault; and
- (4) a plan to conduct an independent review of the NNSA's progress on implementing the Government Accountability Office recommendations.

TITLE XVI—SPACE ACTIVITIES, STRATEGIC PROGRAMS, AND INTELLIGENCE MATTERS

ITEMS OF SPECIAL INTEREST

SPACE ACTIVITIES

Alternate Global Positioning System Constellation

The committee remains concerned about potential threats to the Global Positioning System (GPS) program and position, navigation, and timing (PNT) resiliency. The committee supports the current GPS III program, but believes there should be redundant PNT capabilities to mitigate threats posed to our current GPS architecture. The committee understands that in 2019, the U.S. Air Force designated the Navigation Technology Satellite-3 (NTS-3) program as one of three Air Force “Vanguard” programs that integrate science and technology advances to

demonstrate transformational military technologies and operational concepts. Additionally, the committee understands that NTS-3 is the first satellite navigation (SATNAV) space experiment in 40 years that is intended to test new hardware including an electronically steerable, high-power phased array antenna coupled with a digital signal generator that can be reprogrammed on orbit, enabling operators to quickly deploy newly developed, advanced signals as they encounter electronic threats.

Furthermore, NTS-3 will be working on PNT enhancements such as experimental antennas, flexible and secure signals, increased automation, and use of commercial assets. NTS-3 technology is intended to complement and add resiliency to GPS satellites that fly in Medium Earth Orbit (MEO). The committee understands NTS-3 technology enhances space-based SATNAV systems by investing in capabilities to mitigate and increase resiliency from harmful interference. The committee believes the Air Force must prioritize GPS resiliency by ensuring the Department of Defense has an alternate PNT capability available should GPS be denied.

Therefore, the committee directs the Secretary of the Air Force, in coordination with the Director of the Air Force Research Lab and the Chief of Space Operations, to provide a briefing to the House Committee on Armed Services not later than December 31, 2021, on a detailed funding, development, procurement, and launch plan to deploy an alternate PNT constellation that provides the following capabilities:

- (1) rapid deployment of PNT satellites to address emerging electronic warfare threats to GPS;
- (2) regional military signal protection to resist jamming and on-orbit reprogrammability to counter spoofing; and
- (3) active Electronically Steered Phased Array antenna that can be configured to support simultaneous area of operations broadcasting independent and unique signal configurations.

Commercial Cloud for Military Space Programs

The Department of Defense has stated that it “is embarking on the most significant transformation in the history of the U.S. national security space program” according to the 2020 Defense Space Strategy. This transformation will require the Department of Defense, and in particular the U.S. Space Force, to rapidly embrace modern and advanced commercial technologies to address the challenges in space and ensure U.S. leadership in this vital domain. The committee commends the Chief of Space Operations’ goal to create a “digital service from the ground up.”

When creating a digital service, the committee recognizes the importance of the collection, transport, and processing of data for space development and operations. The space community has been challenged by the processing of massive amounts of data from space systems, fusing the disparate information across

multiple security levels, and providing the relevant information to the necessary users at speed and scale. The committee fully supports commercial cloud adoption for military space programs and believes that cloud-based technologies are essential to these challenges and fundamentally modernize the infrastructure of space mission systems.

Therefore, the committee directs the U.S. Space Force Chief Technology and Innovation Officer, in coordination with the Commander of the Space and Missile Systems Center, to provide a briefing to the House Committee on Armed Services by December 31, 2021, on how the U.S. Space Force will work with the Department of Defense Chief Information Officer, as well as the Chief Information Officer of the Department of the Air Force, to leverage modern cloud computing technologies for space programs and systems. The plan should include, at a minimum:

- (1) an inventory of current space programs with a description of how the activities do, or do not, leverage cloud-based technologies;
- (2) opportunities to increase modern commercial cloud technology adoption, including full and open competitions for industry providers;
- (3) challenges or impediments related to adoption of such technology; and
- (4) timelines and resources required to execute the plan for cloud technology adoption for space programs.

Commercial Imagery Capabilities

The committee recognizes U.S. commercial remote sensing capabilities serve a critical national security function for the Department of Defense, intelligence community, and combatant commands. Timely, accurate geospatial intelligence (GEOINT) and satellite imagery is integral to the safety and success of our nation's warfighters. The committee supports programs and exercises that leverage commercial GEOINT satellites, automatic target recognition systems using the latest artificial intelligence capabilities, and direct downlinks to remote ground terminals to help military leaders rapidly execute long-range precision fires.

The committee also recognizes the requirement for U.S. Special Operations Command (USSOCOM) to maintain situational awareness in operational environments and the role intelligence, surveillance, and reconnaissance plays in ensuring a complete battlefield picture. The committee notes that multiple commercial Earth observation companies provide global imagery that may be able to fill gaps and provide value to USSOCOM and regional combatant commands.

Therefore, the committee directs the Secretary of Defense, in coordination with the Directors of the National Reconnaissance Office and National Geospatial-Intelligence Agency as required, to submit a report to the House Committee on Armed Services not later than December 31, 2021, identifying each commercial vendor that provides global imagery to support Department of Defense combatant commands, any gaps that exist in GEOINT intelligence, surveillance, and reconnaissance capacity, and an assessment of how commercial capabilities can be

integrated into the current and planned sensor-to-shooter programs across the services.

Commercial Radio Frequency Capabilities

The committee recognizes the benefits to national security that commercial space-based radio frequency (RF) capabilities can provide in satisfying national security user needs, enabling greater international cooperation, increasing architectural resilience and diversity, and extending U.S. technological advantage in space. The committee believes more concrete steps must be taken to deliver and integrate U.S. commercial space-based RF capabilities. The committee expects the Secretary of Defense to provide direction on leveraging U.S. commercial space-based RF capabilities, explicitly data, products, and services, to appropriate components through planning and programming guidance, and to include funding for such capabilities in the Department's Future Years Defense Program, in accordance with section 1612 of the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021 (Public Law 116-283). Therefore, the committee directs the Secretary of Defense, in consultation with the Director of National Intelligence, to submit a report to the congressional defense and intelligence committees by January 31, 2022, that describes how the Department of Defense, in collaboration with the intelligence community, is implementing such policy in its planning, programming, and budgeting guidance.

Commercial Space Situational Awareness

The committee believes that, in an increasingly congested and threatened environment, the space situational awareness (SSA) and space domain awareness (SDA) missions are essential to U.S. Government, allied, and commercial space operations. The committee views the use of commercial data for this mission as an important part of an integrated approach to achieving a full, comprehensive common operational picture of the space environment from traffic management and threat awareness in all orbits. However, the committee notes the lack of clear Department of Defense plans for incorporating commercial space situational awareness, including radio frequency (RF) sensing, into the wider commercial SSA architecture to support Joint All Domain Command and Control (JADC2) and a broad range of intelligence operations. Therefore, the committee directs the Chief of Space Operations to provide a briefing to the House Committee on Armed Services by March 1, 2022, on a comprehensive acquisition strategy that incorporates commercial RF sensing capabilities into a resilient and integrated SSA/SDA architecture to augment and inform multi-orbit, all-weather, and day/night collection capability for the Department.

Further, the committee directs the Comptroller General of the United States to submit a report to the congressional defense committees by February 1, 2022, on the following:

- (1) an assessment of current U.S. space situational awareness and space domain awareness capabilities that includes an analysis of the number and size of objects tracked in low-Earth orbit, geosynchronous-Earth orbit, and cislunar orbit;
- (2) a review of planned systems development and procurement of commercial space situational awareness and space domain awareness across the Future Years Defense Program, including cost and schedule estimates;
- (3) an overview of the U.S. Space Force Unified Data Library that includes current volume, access to new observational data, U.S. Space Command utilization; and
- (4) recommendations to improve the use of commercial space situational awareness and space domain awareness data services.

MISSILE DEFENSE PROGRAMS

Layered Defense for the Homeland

The committee notes advances in long-range missile capabilities by rogue states, particularly by making significant developments towards more sophisticated missile and rocket technologies, from use of solid fuels to developing new submarine-launched ballistic missiles. The committee continues to encourage the Department of Defense to analyze and assess these variable threats posed by these missile and rocket capabilities, as well as provide an analysis of gaps in homeland missile defense, with focus on missile defense gaps along the east coast of the United States. As such, the committee looks forward to receiving from the Department a report on layered homeland missile defense system as directed by section 1648 of H.R. 6395, the William M. (Mac) Thornberry National Defense Authorization Act for Fiscal Year 2021, as passed by the House.

Further, the committee notes the successful test of the Aegis Weapon System (AWS) and Standard Missile-3 (SM-3) Block IIA against an intercontinental-range ballistic missile (ICBM) in November 2020, and funding requested by the Missile Defense Agency to continue development of a layered defense architecture. Therefore, the committee directs the Director of the Missile Defense Agency, in coordination with the Under Secretary of Defense for Policy, Chief of Naval Operations, and Commander of U.S. Northern Command, to submit a report to the House Committee on Armed Services by December 31, 2021, on development and deployment plans for using the AWS with SM-3 Block IIA interceptors as part of a layered missile defense system. The report shall include:

- (1) requirements for deploying a layered defense using the AWS and SM-3 Block IIA for defense of the continental United States (CONUS);
- (2) analysis of future AWS and SM-3 Block IIA locations that would support improved defensive coverage of CONUS, and how the preferred location of Fort Drum, NY, for a CONUS interceptor site using Ground-Based Interceptors could be leveraged for a future layered defense system;

(3) analysis of how deploying Arleigh Burke-class guided-missile destroyers for the homeland missile defense mission would impact Navy readiness and global force management;

(4) should land-based AWS systems be deployed for layered homeland defense, the applicable manning strategy; and

(5) any applicable lessons learned from analysis conducted for the Guam Defense System that could be applied to a layered homeland defense architecture, particularly for locations previously evaluated and preferred for a CONUS interceptor site.

Leveraging AN/TPY-2 Radar Foreign Military Sales for U.S. Programs

The committee is aware of a limited opportunity for the United States to leverage the Army/Navy Transportable Radar Surveillance (AN/TPY-2) production line restart driven by recent Terminal High Altitude Area Defense (THAAD) foreign military sales (FMS) case. In fiscal year 2021, Congress supported the production of a 13th AN/TPY-2 radar, which will be the first U.S. production of the modernized Gallium Nitride (GaN) configuration of the system, providing greater range and discrimination.

The Missile Defense Agency (MDA) plans to keep the current system antenna viable through 2040, initially with a removal and replacement (R&R) strategy of Transmit Receive Integrated Microwave Modules (TRIMMs) and beginning in 2026, the full radar replacement of TRIMMs with GaN. The R&R sustainment strategy would not achieve the capability improvements associated with a full GaN refresh of TRIMMs. Therefore, the committee directs the Director of the Missile Defense Agency to provide a briefing to the House Committee on Armed Services by February 1, 2022, on:

- (1) current and planned production rates of TRIMMs through 2025;
- (2) opportunities to increase production rates above the current plan; and
- (3) recommendations to accelerate procurement delivery of TRIMMs to support a full refresh of existing radars.

NUCLEAR FORCES

Cybersecurity Requirements in the Nuclear Modernization Life Cycle

The committee recognizes that the Department of Defense has taken actions recently to make high-tech weapon systems more secure and less vulnerable to cyberattacks. However, the committee is concerned about cybersecurity vulnerabilities and digital security in the nuclear modernization acquisition process. The committee believes that digital systems must meet established security and reliability thresholds before being integrated into the nuclear enterprise. As noted in a March 2021 Government Accountability Office report (GAO-21-179), the Department should issue additional guidance to better communicate requirements to contractors. In addition, the report noted that Department of Defense Chief

Information Officer officials support development of another overlay for nuclear command, control, and communications systems.

Therefore, the committee directs the Under Secretary of Defense for Research and Engineering, in coordination with the Under Secretary of Defense for Acquisition and Sustainment, to submit a report to the House Committee on Armed Services not later than December 31, 2021, on cybersecurity requirements in the nuclear modernization acquisition life cycle. The report shall include at a minimum the following:

- (1) current digital security standards for the nuclear modernization process;
- (2) the degree to which the Department has considered requiring additional digital security and reliability metrics during the acquisitions process; and
- (3) an assessment of requiring third-party, independent tests to confirm that security and reliability requirements are met before a system becomes operational.

OTHER MATTERS

Testing Infrastructure to Support Strategic and Missile Defense Programs

The committee notes that developing and fielding hypersonic offensive and defensive capabilities continues to be a priority for the Department of Defense, with multiple programs of record across the services and agencies. As a component of each of these efforts, testing infrastructure continues to be highlighted as an area in which the United States lacks infrastructure and capacity to conduct needed subscale, developmental, and operational testing, in addition to extensive modeling and simulation needed to validate system performance prior to production and deployment. The same infrastructure is also needed for other strategic systems, such as the Ground Based Strategic Deterrent (GBSD), Long Range Stand Off Weapon (LRSO), and Next Generation Interceptor (NGI).

Therefore, the committee directs the Under Secretary of Defense for Research and Engineering, in coordination with the Secretaries of the military departments, Director of Operational Test and Evaluation, and Director of the Missile Defense Agency, to submit a report to the congressional defense committees not later than February 28, 2022, on an integrated master plan for the required testing infrastructure needed across hypersonic, strategic, and missile defense portfolios over the next 10-year timeframe, including:

- (1) an integrated ground and flight test schedule for hypersonic offensive and defensive programs in addition to GBSD, LRSO, and NGI, for fiscal years 2022 through 2028;
- (2) an inventory of flight and ground test ranges and other needed testing infrastructure, such as wind tunnels and arc heaters, required to meet subscale, developmental, and operational testing of programs of record;
- (3) a list of modernization efforts that support strategic and missile defense testing, including a listing of projects and the associated National Environmental Policy Act initiatives and timelines;

(4) a list of existing and planned facilities at academic institutions and other Federal agencies (e.g., National Aeronautics and Space Administration) that have hypersonic testing capability, including propulsion systems, combustor testing for transition from gas turbine to scramjet, and scramjet testing for dual mode propulsion;

(5) deficiencies that exist either in flight test ranges or areas such as wind tunnels and arc heaters, that would need to be addressed in the next 10-year timeframe to support required testing; and

(6) how high fidelity modeling and simulation could augment ground and flight testing requirements.

DIVISION C—DEPARTMENT OF ENERGY NATIONAL SECURITY AUTHORIZATIONS AND OTHER AUTHORIZATIONS

TITLE XXXI—DEPARTMENT OF ENERGY NATIONAL SECURITY PROGRAMS

ITEMS OF SPECIAL INTEREST

Briefing on Capabilities, Plans, and Strategy with regard to Artificial Intelligence, Machine Learning, and Data Science

The National Nuclear Security Administration (NNSA) laboratories maintain and foster important capabilities for the Nation with regard to artificial intelligence, machine learning, and data science. Additionally, advances in these areas provide opportunities, challenges, and risks to the nuclear security enterprise. Given their cross-cutting nature, the committee directs the Administrator of the National Nuclear Security Administration to provide a briefing to the House Committee on Armed Services not later than March 1, 2022, on the NNSA's plans for an enterprise-wide strategy with regard to artificial intelligence, machine learning, and data science. The briefing should include:

(1) an inventory of the NNSA laboratories' capabilities in this area;

(2) opportunities to expand such capabilities;

(3) what investments in software, data, and infrastructure are necessary to improve capabilities; and

(3) whether any realignment or new organizational structures may be necessary to further foster the development of such capabilities.

Comptroller General Review of Insider Threats to the Nuclear Security Enterprise

The National Nuclear Security Administration (NNSA) is undergoing the largest expansion of its workforce in decades resulting in the hiring of thousands of employees per year. Given the sensitivity of the work conducted within the nuclear

enterprise, the NNSA must ensure its facilities, information, and workforce are protected from a range of threats, including potential insider threats. Therefore, the committee directs the Comptroller General of the United States to undertake a review of the Department of Energy's insider threat programs with respect to the nuclear security enterprise. The Comptroller General should review the adequacy of such programs to respond to modern threats and the adequacy of funding for insider threat programs.

The committee further directs the Comptroller General of the United States to provide a briefing to the House Committee on Armed Services by February 1, 2022, on the Comptroller General's preliminary findings and to submit a final report on a date agreed to at the time of the briefing.

Comptroller General Review of the Enhanced Capability for Subcritical Experiments Program

The National Nuclear Security Administration's (NNSA) Stockpile Stewardship Program seeks to maintain confidence in the safety, security, and reliability of U.S. nuclear weapons without nuclear testing. As part of the program, NNSA conducts experiments to obtain scientific data on the behavior of nuclear weapon materials, such as plutonium, with the use of complex, high-speed diagnostic instruments.

To address these needs, NNSA developed the Enhanced Capabilities for Subcritical Experiments (ECSE) program. Executing the ECSE program relies on a number of construction projects and activities at the U1a Complex. When the ECSE program and its associated construction projects are considered together, NNSA is proposing to spend several billion dollars over the next 5 years.

Therefore, the committee directs the Comptroller General of the United States to review the ECSE program, including its adequacy to support the plutonium pit production program and plutonium science programs. The committee further directs the Comptroller General to provide an interim briefing to the House Committee on Armed Services not later than December 31, 2021, and a final report to the committee not later than April 1, 2022.

Independent Review Team Report on the B61-12 Life Extension Program and W88 Alteration 370 Technical Issue

The committee commends the work of the Independent Review Team (IRT) in studying the root causes of the capacitor technical issue associated with the B61-12 life extension program and the W88 alteration 370 program. The issue resulted in significant delays and cost increases in the W88 and B61 programs. The IRT's work resulted in numerous recommendations to ensure future life extension programs and major alterations do not incur similar issues. Of note, the IRT found that: "Recognizing the nuclear security enterprise has not sufficiently incorporated lessons learned from prior and on-going modernization programs, the IRT concludes there is a likelihood of more widespread, latent issues stemming from early

program decisions." As such, the committee urges the Administrator of the National Nuclear Security Administration (NNSA) to reconstitute the IRT at the appropriate time to gauge the NNSA's progress in implementing its recommendations. Therefore, the committee directs the Administrator of the National Nuclear Security Administration to provide a briefing to the House Committee on Armed Services not later than February 28, 2022, on the implementation of the IRT recommendations, with a focus on changes made to ensure future Life Extension Programs, namely the W80-4, will not incur similar issues.

Sustaining and Improving Monitoring, Detection, and Verification Test Bed Capabilities

The committee notes the important work of the National Academies study on "Nuclear Proliferation and Arms Control Monitoring, Detection, and Verification." In its interim report, the study noted the importance of test beds to the monitoring, detection, and verification mission. In particular, it found that, "The test beds are a cost-effective, innovative use of the Department of Energy's National Nuclear Security Administration complex to provide research facilities to the nonproliferation and arms control research, development, test, and evaluation community. The vision, communication, and access to the test beds have potential for improvement." Therefore, the committee directs the Administrator of the National Nuclear Security Administration to provide a briefing to the House Committee on Armed Services not later than February 1, 2022, on expanding the Monitoring, Detection and Verification (MDV) test bed capability of the United States. The briefing should include:

- (1) a plan to expand the MDV test bed capability over the next 10 years;
- (2) costs and schedules to implement such a plan;
- (3) an external review of test bed capabilities; and
- (4) options for ensuring test bed capabilities are available to and leveraged by universities.