

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

## OVERVIEW

The budget request contained \$69.77 billion for research, development, test, and evaluation. This represents a \$6.09 billion increase over the amount authorized for fiscal year 2015.

The committee recommends \$68.35 billion, a decrease of \$1.42 billion to the budget request.

The committee recommendations for the fiscal year 2016 research, development, test, and evaluation program are identified in division D of this Act.

## RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, ARMY

### Overview

The budget request contained \$6.91 billion for research, development, test, and evaluation, Army. The committee recommends \$7.02 billion, an increase of \$105.5 million to the budget request.

The committee recommendations for the fiscal year 2016 research, development, test, and evaluation, Army program are identified in division D of this Act.

### Items of Special Interest

#### *Acoustic mixing technology for energetic materials*

The committee understands that the Army currently uses low-frequency, high-intensity sound waves, in a technology called “acoustic mixing” during the manufacturing of some munitions. The committee understands acoustic mixing technology is currently being used at McAlester Army Ammunition Plant (MCAAP) where a 5-gallon capacity acoustic batch mixer is being employed to produce munitions boosters at a cost savings of \$1,000 per unit. The U.S. Air Force demand for this product is 2,500 per month, which should result in an equipment payback of

less than 6 months. The committee notes that MCAAP has embraced acoustic mixing technology with the intent of utilizing it to further exploit its usefulness, further increase productivity, as well as environmental and safety improvements at their facilities.

The committee believes this technology could have broader applications and could have the potential to improve industrial efficiency and productivity throughout the Department of Defense munitions enterprise. The committee encourages the Secretary of the Army to continue to evaluate and refine acoustic mixing technology capabilities.

#### *Active protection system*

The budget request contained \$55.4 million in PE 63005A for combat vehicle and automotive advance technology, which includes funding for Active Protection System (APS) research and development.

The committee is encouraged that funding for APS research and development was included in the fiscal year 2016 budget request. In the committee report (H. Rept. 113-102) accompanying the National Defense Authorization Act for Fiscal Year 2014, the committee noted that a lack of investment could soon create a critical capability gap for Army combat vehicles due to the rapid proliferation of advanced anti-tank guided missiles and next-generation rocket propelled grenades. The committee notes that there are numerous types of APS available, including some that have already been fielded on operational vehicles in other countries and have performed well in recent demonstrations. It is crucial the Army keeps momentum going in this important effort; therefore, the committee encourages the Army to establish a program of record to ensure APS is integrated into the Army's combat and tactical vehicle platforms as soon as practicable based on technology development and funding. In addition, the committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by January 31, 2016, that includes a description of all currently planned and budgeted activities that are related to active protection systems.

The committee recommends \$55.4 million, the full amount requested, in PE 63005A for combat vehicle and automotive advance technology.

#### *Advanced tactical shelters*

The committee is aware that the Department of Defense Joint Committee on Tactical Shelters has identified emerging requirements for current and future advanced tactical shelters. Among those is a requirement to provide antimicrobial protection for tactical medical shelters, as well as for protection from the adverse effects of electromagnetic interference and electromagnetic pulse (EMI/EMP). Further, the committee is aware of an emerging technology process called cold spray which has the potential to address these two requirements. Cold spray has proven effective in the application of copper-based alloys onto touch surfaces in order to protect against microbial infection in field hospitals. Similarly, cold spray

technology provides a non-destructive process, currently unavailable through traditional joining methods, for sealing aluminum joint panels in tactical shelters, thereby reducing EMI/EMP leakage and infrared signature, as well as improving energy efficiency. The committee encourages the Department to continue development of advanced materials and materials processing approaches such as cold spray to attempt to meet these requirements.

#### *Army airborne networking radios*

The budget request contained \$12.9 million in PE 65380A in research, development, test, and evaluation, Army for the Airborne, Maritime, Fixed Station (AMF) Joint Tactical Radio System (JTRS). Of this amount, \$6.8 million was requested for the Small Airborne Link 16 Terminal (SALT) and \$6.2 million was requested for the Small Airborne Networking Radio (SANR).

The committee supports continued fielding of network capability to Army airborne systems. The committee notes with concern that both the SALT and SANR programs have been delayed by 3 years, with milestone C now scheduled for fiscal year 2019. The committee believes that delay in procurement of next-generation radios for the aerial network tier will require the Army's airborne platforms to rely on legacy waveforms. As a result, airborne assets will not be able to leverage the terrestrial network or an airborne network for increased situational awareness or connectivity. The committee notes that the Army is examining interim, competitively awarded, solutions for both of these systems. The committee supports both the procurement of effective interim solutions that provide capability as soon as possible and the potential acceleration of both the SALT and SANR programs.

The committee recommends \$12.9 million, the full amount requested, in PE 65380A in research, development, test, and evaluation, Army for the AMF Joint Tactical Radio System.

#### *Army Energy Efficiency Research and Development Programs*

The committee is aware that the Army has numerous research and development efforts in the area of reducing energy use across the Army. However, the committee seeks to better understand the totality of the Army's efforts. The committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services no later than April 1, 2016 on all Army Research, Development, Test and Evaluation (RDT&E) undertaken in the last 5 years on technologies that may improve the range and endurance of tactical vehicles without increasing fuel demand. The briefing should also include RDT&E efforts involving auxiliary power units, batteries, and other engine technologies for running 'hotel' loads and surveillance systems during silent watch. Finally, the briefing should include information on any ongoing efforts or future plans for incorporating these technologies into programs of record or new acquisitions. For all systems described, the briefing should identify funding amounts and requirements.

### *Army Warfighting Assessment and network experimentation activities*

The budget request contained \$99.2 million in PE 64798A for Brigade Analysis, Integration and Evaluation.

The committee supports the Army's Force 2025 initiative to make the Army a more expeditionary force while improving tactical mobility, lethality, protection, and sustainability. In addition, the committee supports the Network Integration Evaluation (NIE) and Army Warfighting Assessment (AWA), which are required to ensure the Army can attain Force 2025 goals. The committee believes that the NIE and AWA must continue to be an integral part of the Army's modernization to ensure future policies and procurements can successfully be integrated into the Army's operations. The Army should ensure that NIE and AWA remain a part of the Army's acquisition, and research, development, testing, and evaluation processes into the future.

The committee recommends \$99.2 million, the full amount requested, in PE 64798A for Brigade Analysis, Integration and Evaluation.

### *Ballistic Resistant Adaptive Seating System*

The committee understands current helicopter seating systems (HSS) were designed for primarily limited duration missions and focused solely on mitigating injuries from hard landings. The current seating system design did not consider other areas of concern that could impact the warfighter, such as increases in flight duration, the long-term effects of poor ergonomics, whole body vibration, as well as changes in pilot demographics, to include omitting female pilot anthropomorphic data. The committee understands the Department of Defense and the Army are studying current HSS designs and have identified a need to improve current systems. The committee is aware the Joint Aircraft Survivability Program Office, the U.S. Army Aviation Development Directorate—Aviation Applied Technology Directorate, and industry are now focusing on identifying, developing, and optimizing new technologies in order to mitigate or eliminate deficiencies in current HSS performance. The committee believes the Department should develop ways to accelerate this technology, which could provide increases in force protection, survivability, as well as eliminate long-term disability that is common in rotary wing aviators. The committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services not later than January 15, 2016, on any plans for the potential improvement of the HSS.

### *Composite barrel technology development*

The committee has long championed weight reduction initiatives for individual soldier equipment to include small arms and mortars. The committee believes that advances in material technology for small arms and mortar components could significantly improve overall performance of these weapon systems. The committee is aware that hybridized advanced composite barrel

systems should be designed to incorporate high-performance materials such as a polyimide matrix composite comprising a resin matrix, thermally conductive additives, thermal management coatings, and continuous high-strength and high modulus structural fibers. The committee encourages the Assistant Secretary of the Army for Acquisition, Logistics, and Technology to analyze, design, manufacture, test, and invest in medium caliber barrels and muzzle brakes that utilize advanced composite technologies that would increase stiffness, optimize mass/center of gravity, and increase the life span of the system. The committee understands this capability could also provide for increases in accuracy, performance, and lethality of medium caliber weapon systems such as the M240 medium machine gun. Additionally, the committee encourages the continued development of advanced high-temperature resistant composite technologies for lightweight mortar tubes and recoilless rifles. The committee believes that with additional investment these advanced technologies could provide light infantry units with mortar systems, such as the 81mm mortar system, with weight reduction, thermal performance, and longevity that will enable the military services to affordably maintain overmatch capability on the battlefield as well as provide growth capacity for these advanced weapon systems.

#### *Detection and threat identification technologies*

The committee is aware that the Defense Threat Reduction Agency continues to have a strong partnership with each of the military services, as well as with U.S. Special Operations Command, which has contributed to the development and fielding of technologies that reduce, counter, and eliminate the threat of chemical, biological, radiological, nuclear and high-yield explosive materials. The committee remains concerned about credible threats posed by state and non-state actors in their attempts to acquire and weaponize chemical and biological materials for use against the United States and its allies. Therefore, the committee encourages the Defense Threat Reduction Agency to continue the genomic research and development of innovative and emerging detection, threat identification technologies and medical countermeasures to ensure prompt transition of validated capabilities to address the emerging infectious disease threats. The committee emphasizes the importance of advancing genomic research as a method to stay ahead of the changing emerging threats from highly infectious viruses.

Therefore, the committee directs the Director of the Defense Threat Reduction Agency to provide a briefing to the House Committee on Armed Services by December 31, 2015, on its efforts to prioritize the prompt transfer of funding to the U.S. Army Medical Research Institute of Infectious Disease to advance research as it relates to genomics and highly infectious threats, to include the potential for lightweight, handheld devices for diagnostics, detection, and analysis.

#### *Fuel system survivability technology and standards*

In the committee report (H. Rept. 112-479) accompanying the National Defense Authorization Act for Fiscal Year 2013, the committee directed the Director of the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) to provide a report to the congressional defense committees that detailed the status of the Army's evaluation of occupant centric survivability systems for combat and tactical vehicles. In the committee report (H. Rept. 113-102) accompanying the National Defense Authorization Act for Fiscal Year 2014, the committee directed the Director of TARDEC to brief the Senate Committee on Armed Services and the House Committee on Armed Services on the advisability and feasibility of establishing objective and threshold survivability operational requirements for thermal injury prevention in ground combat and tactical vehicles. The Joint Explanatory Statement (Committee Print No. 4) accompanying the Carl Levin and Howard P. "Buck" McKeon National Defense Authorization Act for Fiscal Year 2015 directed the Secretary of the Army to submit a report to the congressional defense committees that addresses thermal injury prevention needs to improve occupant centric survivability systems for combat and tactical vehicles against overmatching ballistic threats.

Based on information gathered from these required reports and briefings, the committee encourages the Secretary of the Army to develop operationally realistic survivable fuel system specifications, as well as develop standards for ground combat and tactical vehicles that would address fuel containment technology requirements consistent with vehicle survivability requirements.

#### *Geo-Enabled Mission Command Enterprise*

The committee is aware that the Geo-Enabled Mission Command Enterprise works to provide access to analytic tools for users in bandwidth-constrained environments, increasing the situational awareness of the operational environment in support of mission planning and operations. However, the committee also notes that there are currently concerns about the standardization of how geospatial information is displayed, creating the potential for confusion during mission planning and combat operations. The Army is seeking to improve the display of digital geospatial information in a common manner across various hardware platforms that are developed by different organizations in the Army and the committee is also aware that the Marine Corps is struggling with similar requirements to rapidly share all-source geospatial information across the Marine Corps in similar conditions. The committee encourages exploring potential further investment in competitively procured commercial geospatial products to provide a common operating picture and ensure the efficient exchange of information during critical operations across all echelons. The committee encourages the Army and the Marine Corps to work together to the extent practicable in order to jointly invest in technological solutions to satisfy those like requirements.

#### *High-resolution 3-D topographic terrain data supporting tactical operations*

The committee is concerned about the continuing lack of timely, high-resolution topographic terrain data and high resolution 3D imagery needed by combatant commanders and tactical operators to plan, train for, and conduct operations over complex, urban terrain, as well as in dense foliage. The committee is aware that the Department of Defense currently relies upon certain space-based capabilities to provide such data, but that there are limitations in the capacity of those assets, as well as technical limitations that significantly hamper collection in certain environments. The committee believes that in some permissive environments, manned or unmanned airborne collection could provide the necessary detail, capacity, timeliness and coverage needed to support tactical and operational planning. This has been demonstrated by operational experience in the Government of the Islamic Republic of Afghanistan, as well as the Republic of Iraq, and is reinforced by the continuing requests for capability from joint urgent operational needs statements.

Therefore, the committee directs the Secretary of the Army to conduct an analysis of the high-resolution 3-D topographic terrain data requirements to support tactical operations, and brief the House Committee on Armed Services by November 1, 2015 on the results. This assessment should determine the current requirements from the combatant commands, as well as a projection for the required needs across the future year's defense plan, and compare that to the ability of the current systems to meet those needs. In instances where the projected requirements are not being satisfied by the current capabilities, the Secretary should make recommendations about how to address such shortfalls.

#### *Human performance research*

The committee is aware that ongoing research on human performance, augmentation and cognitive enhancement is an important component of a soldier-centric Army strategy for the future warfighting force. During a time when the Army is being asked to do more with less, the committee supports initiatives that aim to improve warfighter's cognitive, physiological, physical, and nutritional performance. These human performance dimensions will ensure military overmatch against current adversaries and emerging threats and align with Army goals and future requirements for human-soldier performance and enhancement.

Improvement of human performance also supports the U.S. Army Capstone Concept's central idea of operational adaptability by providing a framework to maximize individual and team performance through the identification, development, and optimal integration of human capabilities. To this end, the committee is aware of Army efforts to design and build a research facility called the Soldier Squad Performance Research Institute to enhance soldier performance. The committee encourages the Army to consider locating that facility in a region containing the best research, development, test, and evaluation support system, including industrial, academic, and Federal facilities to support its mission with the

necessary specialized talent in medical research, life science, human performance science, physical, nutritional, and psychological research.

### *Improved Turbine Engine Program*

The budget request contained \$51.2 million in PE 67139A for the Improved Turbine Engine Program (ITEP).

The committee continues to support the Army research and development budget request for ITEP, as well as the acquisition strategy included in the request. ITEP is a competitive acquisition program that is designed to develop a more fuel efficient and powerful engine for the current Black Hawk and Apache helicopter fleets. This new engine will increase operational capabilities in high/hot environments, while reducing operating and support costs. The committee acknowledges the benefits of improved fuel efficiencies through lower specific fuel consumption that the ITEP will bring to the battlefield. In addition, the committee encourages the Army to prioritize maintenance and sustainment cost savings for ITEP to ensure the continued affordability of the program.

The committee recommends \$51.2 million, the full amount requested, in PE 67139A for the ITEP program.

### *Indirect Fire Protection Capability*

The committee notes that the Army is planning on integrating only a single missile as part of the Indirect Fire Protection Capability (IFPC) Increment 2 Block 1 program. The committee is concerned by the lack of funding to assess the suitability of other interceptors known to have significant capability to address rocket, artillery, and mortar threats, as well as other threat classes, to demonstrate the Multi-Mission Launcher can perform multiple missions.

Therefore, the committee directs the Secretary of the Army to provide to the House Committee on Armed Services by January 15, 2016, the Alternate Interceptor Trade Study that was directed by the Under Secretary of Defense for Acquisition, Logistics, and Technology in 2014. In addition, the committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by January 15, 2016, that details the Army's plan and an estimate of required funding to potentially demonstrate and integrate alternate interceptors on the Multi-Mission Launcher before milestone B of the IFPC Increment 2 Block 1 program.

### *Joint Improvised Explosive Device Analysis Tool*

The committee is concerned that the Army decided not to field Joint Improvised Explosive Device Analysis Tool (JIST) software after spending more than \$10.0 million developing it in conjunction with the Joint Improvised Explosive Device Defeat Organization (JIEDDO). While the committee understands that the Army intends to use an existing software program currently resident in the

Distributed Common Ground Station-Army (DCGS-A) program to partially meet the requirement for improvised explosive devices (IED) forensic analysis, the committee believes that the critical nature of the enduring IED threat likely demands a dedicated software analysis tool to fully meet intelligence analysis requirements. Elsewhere in this Act, the committee recommends a provision that would require the Army to detail its plans for competition of selected DCGS-A components as part of the DCGS-A Increment 2 program. The committee expects the Army to include IED forensic analysis tools as part of any DCGS-A Increment 2 competition plans. In addition, the committee directs the Inspector General of the Department of Defense to deliver a report, not later than March 1, 2016, to the House Committee on Armed Services regarding JIEDDO's and the Army's processes and decisions that led to the development of JIST software and the subsequent decision not to field it.

#### *Land-Based Anti-Ship Missile Program*

The committee notes that the October 2014 Army Operating Concept, "Win in a Complex World," emphasizes the role for Army forces to project land based power into other domains and that, "Future Army forces will support joint force freedom of movement and action through the projection of power from land across the maritime, air, space, and cyberspace domains." The committee also notes in a technical report prepared for the U.S. Army entitled "Employing Land Based Anti-Ship Missiles in the Western Pacific" that the RAND corporation concluded that, "Land-based ASMs (Anti-Ship Missiles) are readily available on the world's arms markets, are inexpensive, and would provide significant additional capabilities to the United States if integrated into the Army or the Marine Corps force structure."

Therefore, the committee directs the Secretary of Defense to submit a report to the congressional defense committees by March 1, 2016, as to the feasibility, utility, and options for mobile, land-based systems to provide anti-ship fires. Such fires should be addressed within the total portfolio of land based fires against air and surface based threats, including total cost considerations such as research and development, procurement, sustainment, and force structure considerations.

#### *Lethal Miniature Aerial Munition System*

The committee notes the Army's goal of improving infantry squad capability through a variety of means, including precision weapons with increased ranges compared to current systems. The committee is aware of the effectiveness of the Lethal Miniature Aerial Munition System (LMAMS) currently fielded in the United States Central Command theater of operations and supports the potential distribution of this capability across Army infantry units. Therefore, the committee directs the Secretary of the Army to submit a report to the House Committee on Armed Services not later than March 1, 2016 on potential transition of the LMAMS to a program of record. The report should include information on the performance of

the system to date, the cost of expanding its issue to more units, and operational suitability and effectiveness issues with the system.

#### *Lithium ion super-capacitors*

The committee is aware of the investments the Army has made in lithium ion super-capacitor research, development, and demonstration. The committee encourages further investment in this important area, as super-capacitors are critical to current and future platforms. Recent advances in lithium ion super-capacitor technology may also mitigate or eliminate safety concerns that have slowed operational deployment of current and future platforms.

#### *Material development, characterization, and computational modeling*

The committee recognizes the importance of evaluation of materials and technologies, designs, and the development of methodologies and models to enable enhanced lethality and survivability. Methods such as computational research allow for the development of models that predict the mechanical properties of materials that are used in research and development at the U.S. Army Research Laboratory (ARL). These models and simulations provide a cost savings to the Department of Defense by simulating materials prior to testing them to ensure mechanical properties will work together. Additionally, these methodologies allow for the enhanced development of technologies such as lightweight armors, protective structures, kinetic energy active protection, ballistic shock and mine blast protection, helmet technologies to prevent traumatic brain injury, as well as numerous other uses. The committee encourages ARL to continue the utilization of computational modeling and simulations research to achieve greater cost savings.

#### *Medical evaluation of anthropomorphic data on vehicle blast testing*

The committee supports the Army's ongoing ground combat and tactical vehicle technology development and testing initiatives designed to mitigate the lethal effects from improvised explosive devices and the subsequent vehicle flight and rollover events. As the Army, along with industry, continues to evaluate emerging technologies, the committee recommends that medical research using anthropomorphic testing be included in ongoing Cooperative Research and Development Agreement test programs between the commercial sector and the Army on new sensors and active protection technologies. The committee believes that test reports should also consider including medical evaluation of anthropomorphic data germane to the analysis of new sensor technology and active protection response technology.

#### *Mobile camouflage systems development*

The committee is concerned that currently fielded camouflage netting systems do not afford adequate passive concealment against current battlefield threats, particularly by short-wave infrared sensors. The committee understands the Department of the Army is currently reviewing a Capability Development Document for an improved Ultra-Lightweight Camouflage Net System. The committee commends these efforts and encourages the Department to accelerate research, development, procurement, and fielding of this advanced camouflage net system. The committee recommends continued development in several two-sided, reversible camouflage patterns, including Woodland, Desert, Urban, and Arctic/Snow, in order to replace outdated systems currently in the field.

#### *Next-Generation signature management system*

The committee is aware that during Operation Enduring Freedom and Operation Iraqi Freedom, several U.S. allied partner nations employed mobile camouflage systems on their combat and tactical vehicles. The committee notes the success of our allies in using these camouflage protective nets to provide effective signature management protection, as well as reducing heat and temperature inside and around combat and tactical vehicles. The committee is not aware of any current official program of record to field mobile camouflage systems for U.S. military combat and tactical vehicles. Therefore, the committee encourages the Department of Defense to consider evaluating mobile camouflage systems for U.S. military combat and tactical vehicles and, should the evaluation prove advisable and feasible, to begin resourcing such programs across the Future Years Defense Program.

#### *Pacific Theater High Performance Computing Capabilities*

The Committee is aware that the Department of Defense's High Performance Computing Modernization Program provides the Department with a strategic tool to accelerate technology development through the application of high performance computing (HPC), networking, and computational expertise. The purpose of this program is to provide the application of high-end computing to increase productivity of the Department's research, development, test, and evaluation community. Moreover, the Committee recognizes that supercomputing resources provided by Department of Defense Supercomputing Resource Centers (DSRC) offer the Services and Combatant Commanders computing solutions that reduce cost, risk, and manpower requirements for in-theater demands.

To this end, the Committee is aware that the Maui High Performance Computing Center (MHPCC) is the only DSRC that offers computing at the TS/SCI classification level, as well as the ability to provide enhanced access to supercomputing resources to Department of Defense customers by secure access to Department of Defense software and computing services through a web browser. Therefore, the Committee directs the Secretary of the Army, in coordination with the Commander, U.S. Pacific Command (PACOM), to brief the congressional

defense committees by December 1, 2015, on the in-theater capabilities offered by the MHPCC, the customer base for the MHPCC, and the value of maintaining flexible, low-latency, high bandwidth classified network access to complement PACOM activities in-theater.

#### *Rotorcraft Degraded Visual Environment*

The committee notes that the Department of Defense Appropriations Act, 2015 (division C of Public Law 113-235) appropriated an increase of \$20.0 million above the budget request for the development or procurement of a Degraded Visual Environment (DVE) system for rotorcraft programs. The committee is aware of the Army's challenge of operating rotary winged aircraft in austere environmental conditions, including brown-out landings and marginal weather while operating in difficult terrain. The committee also believes that the Army's Medical Evacuation, Utility, and Cargo platforms face unique challenges operating in environments that levy significant risks to aircraft and crew members. However, the committee is concerned that the progress for pursuing these critical safety enhancements for rotorcraft programs is taking too long.

Therefore, the committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by August 31, 2015, that includes an update on the Army's plans to test and evaluate DVE sensors and provide a potential funding profile and fielding plan of a DVE system.

#### *Simplified Army Radio Network*

The committee notes that modernizing the tactical network remains a top priority for the Army, and that ease of use will be critical to the success of the deployed tactical network. The committee understands that feedback from deployed capability sets emphasizes the need to simplify tactical communications systems and make them easier for soldiers to operate with minimal training or intervention by industry or civilian field-support representatives. The committee supports the Army's drive to simplify the network and the goals of Force 2025, including efforts already underway to improve waveform configuration, loading, and unit-task reorganization. However, the plan to achieve the goals that the Army has set with regard to improving the network remains unclear.

Therefore, the committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by July 30, 2015, on the Army's current plan to enhance and simplify the network in order to meet the goals of the Simplified Tactical Army Reliable Network, including key milestones and the resources needed.

#### *Situational Awareness Prototype Constellation for Countering Weapons of Mass Destruction*

The Countering Weapons of Mass Destruction (CWMD) situational awareness prototype Constellation is described as a next-generation information gathering, sharing, analysis, collaboration, and visualization system to improve situational awareness across the CWMD enterprise. The committee is supportive of efforts to improve coordination and situational awareness and recognizes the contribution of Constellation to a synchronized, informed whole-of-government response to the Ebola crisis. The committee is also aware of other efforts that have a similar function in tracking and analyzing CWMD threats and believes the Department of Defense should avoid duplication of efforts in this area. The committee further believes that a common platform must be successfully integrated with the other relevant Department of Defense and U.S. Government partners. The committee urges the Defense Threat Reduction Agency to continue to engage the interagency to ensure efforts are fully coordinated and not duplicative.

Therefore, the committee directs the Secretary of Defense to brief the House Committee on Armed Services by July 30, 2015, on the status of the Constellation prototype and the activities for ensuring that it avoids duplication with other CWMD systems.

### *Soldier Enhancement Program*

The budget request contained \$10.5 million across multiple appropriations for the Army's Soldier Enhancement Program (SEP) initiatives.

The SEP was established to evaluate government-off-the-shelf, commercial-off-the-shelf, or non-developmental items to improve weapons and individual equipment for soldiers. The committee notes the SEP does not fund lengthy developmental programs or procure large numbers of major items for fielding, and recognizes the program's design enables evaluation of systems that have the potential to meet an urgent operational need or quickly close a capability gap.

The committee believes additional SEP funding could provide a substantial benefit to the industrial base and to the individual soldier. The committee recognizes that the Army relies heavily on the industrial base for innovation and new product development, and a more optimal funding profile for the SEP could facilitate greater small-scale procurement, more in-depth field evaluation opportunities, as well as the means to rapidly field validated technologies to the soldier in a more streamlined and timely manner. In order to remain responsive and execute the intent of SEP, the committee understands the optimal average SEP funding level is estimated by the Army to be at approximately \$12.0 million to \$14.0 million annually. The committee notes that sub-optimal funding levels would result in an inability to evaluate initiatives for lighter, more lethal weapons, munitions, and individual equipment for soldiers.

The committee recommends \$15.5 million, an increase of \$5.0 million in PE 64601A, for Army SEP initiatives.

### *Soldier Protection System and weight reduction technology*

The Army's Soldier Protection System (SPS) provides a lighter weight modular, scalable integrated system of mission tailorable personnel protection equipment (PPE), while also improving the level of mobility, form, fit, and function for both male and female soldiers. The committee is aware the SPS includes subsystems such as protection for the head, eyes, extremities, torso, and other integrated sensor packages. The committee notes a low-rate initial production decision is expected in fiscal year 2015. The committee understands that the Army plans on fielding two to three brigade combat team sets per year and has programmed approximately \$575.0 million for SPS across the Future Years Defense Program. While the committee commends the Army on their SPS effort, the committee encourages the Army to provide enough funding to maintain two vendors for competitive purposes, and also encourages the accelerated fielding of SPS to all soldiers as a way to sustain current systems through modernization.

The committee understands that body armor system weights have remained relatively constant over the last decade in spite of advances in materials technologies because protection levels have also increased in response to threats. The committee believes current body armor systems provide outstanding protection to the warfighter, but their weight contributes to the overburden issue and decline in performance. The committee commends the Army for addressing this challenge by shifting from a more discrete component level development strategy to a more systems engineering and system level approach to body armor and PPE development as a means to improve soldier capabilities. The committee has long championed the importance of reducing the weight of current body armor and personal protective equipment systems, as well as stressing the critical need for investment in weight reduction initiatives, along with technology insertions to improve performance and survivability. The committee believes the Department of Defense must maintain significant investment in near-term solutions that can effectively reduce the weight of body armor, while also investing in the development of revolutionary new material technologies that could provide for significant breakthroughs in weight and performance.

#### *Technology for countering enemy unmanned aerial systems*

The committee recognizes that enemy unmanned aerial systems represent a growing threat to U.S. and coalition forces. As unmanned aerial systems become more affordable and available, this technology has become increasingly available to non-state actors. The committee is aware of efforts by the Army Electronic Warfare division to develop technology that can recognize the uplinks between unmanned aerial vehicles and controllers on the ground to disrupt system communication to disable such threats and encourages the Army to continue its research into severing these control signals.

#### *Ultra-light combat tactical vehicle test and evaluation*

The committee understands the Army is proceeding forward to address the infantry brigade tactical mobility gap in accordance with a three-phased plan outlined in the operational need statement (ONS) submitted by the 82nd Airborne Division and endorsed by 18th Airborne Corps and the U.S. Army Forces Command. The committee notes the ONS outlined immediate, interim, and long-term solutions to address this urgent capability gap for light infantry units.

The committee understands the immediate solution allows the 82nd Airborne Division to retain a tactical mobility set of high mobility, multi-purpose wheeled vehicles. The interim solution is the procurement of a commercial off-the-shelf (COTS) set of vehicles, and the long-term solution is the development of a programmatic solution through the traditional Army acquisition process. The committee is aware that the Army has addressed the immediate solution and has now authorized the interim COTS solution with the procurement of 33 ultra-light tactical vehicles in order to allow the execution of a proof-of-principle concept. The committee understands that additional vehicle procurement is contingent on the results from testing conducted by the 82nd Airborne Division.

The committee directs the Secretary of the Army to provide a briefing to the House Committee on Armed Services by March 1, 2016, on the test results for the proof-of-principle for the interim solution. Should the test results prove favorable, the committee expects the briefing to provide details of the funding profile and acquisition strategy for the rapid acquisition and fielding of this interim solution, as well as the acquisition strategy for the proposed long-term solution.

#### *Vehicle occupant protection technology development*

The committee is aware of the development of technology to detect and autonomously respond in real time to vehicle underbody explosive incidents with an active response to counter vehicle flight, and reduce the physical effects on vehicle occupants through a Cooperative Research and Development Agreement between industry and the Army. The committee directs the Secretary of the Army to brief the House Committee on Armed Services within 45 days after the date on which the budget for fiscal year 2017 is submitted to Congress pursuant to section 1105 of title 31, United States Code, on the results of the testing on this technology to date, as well as provide an assessment of the potential and prospective timing for this technology to be incorporated into vehicle occupant protection technology vehicle procurement programs.

## RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, NAVY

### Overview

The budget request contained \$17.88 billion for research, development, test, and evaluation, Navy. The committee recommends \$16.65 billion, a decrease of \$1.23 billion to the budget request.

The committee recommendations for the fiscal year 2016 research, development, test, and evaluation, Navy are identified in division D of this Act.

### Items of Special Interest

#### *Advanced Low Cost Munitions Ordnance*

The committee notes the Navy's efforts to develop an Advanced Low Cost Munitions Ordnance (ALaMO) for the Littoral Combat Ship (LCS) by Fiscal Year 2020. The committee believes the LCS program should be equipped with the most affordable, lethal, defensive, and offensive capabilities across all mission areas. The committee supports the Navy's efforts to develop ALaMO, specifically a guided 57mm projectile to counter threats against small boat swarms and others. Therefore, the committee directs the Assistant Secretary of the Navy (Research, Development and Acquisition) to brief the House Committee on Armed Services by August 30, 2015 on the current status of the ALaMO program. The briefing should include, but not be limited to, an evaluation of the current funding profile and schedule for this program across the Future Years Defense Program, as well as discuss potential courses of action to accelerate or streamline the current program strategy.

#### *Anti-Submarine Warfare Continuous Trail Unmanned Vessel*

The committee is aware that the fiscal year 2016 budget request contains funding within research, development, testing, and evaluation, Defense-Wide, for the Defense Advanced Research Projects Agency (DARPA) to continue work on the Anti-Submarine Warfare Continuous Trail Unmanned Vessel.

The committee is aware of and encouraged by recent at-sea tests demonstrating the success of the autonomous command and control software aboard a surrogate test vessel. The committee notes that these tests successfully demonstrated a fully autonomous capability in a manner fully compliant with international collision regulations. Furthermore, the committee is supportive of the growing interest in additional at-sea testing among various Navy commands for other missions.

The committee is further encouraged by the recently signed memorandum of agreement between DARPA and Office of Naval Research, and supports the funding being provided by both organizations for additional at-sea testing. The committee believes that additional testing should support flexibility of the autonomy design and application for additional future missions. The committee recommends continued collaboration between DARPA and the U.S. Navy to ensure the successful transition of this program.

#### *Anti-surface warfare missile capability for Littoral Combat Ship*

The committee is aware of the complex close combat environments that Navy surface combatants encounter when operating in the littorals. Characteristic of this environment is the irregular threat posed by clusters of swarming small boats intermingled with non-combatant vessels. As a result, the anti-surface warfare mission for vessels, such as the Littoral Combat Ship (LCS) and Patrol Coastal (PC) ships, must possess positive-control missile capabilities that enable agile rules of engagement for applying decisive defensive countermeasures while minimizing the risks of collateral damage. Furthermore, it is critical that this balance of capabilities be fielded to the fleet as rapidly as possible.

The committee is also aware of the Navy's efforts to field an anti-surface warfare missile capability for the LCS that meets these criteria; however, the committee is concerned that the current development path will require significant engineering/test and integration work that impacts the initial operating capability. Therefore, the committee directs the Secretary of the Navy to provide a briefing to the House Committee on Armed Services not later than March 1, 2016, detailing the cost and schedule of current development efforts on anti-surface warfare missile capability for the LCS and PC ships. The briefing should evaluate comparative systems' speed of integration to the fleet, range, weight, In-Flight Target Update capability, and ability to leverage existing fielded systems.

#### *Automated Test and Retest*

The committee recognizes the value that the Small Business Innovative Research (SBIR) program provides to the Department of Defense in gaining access to new and innovative technologies that, when successful, can be integrated into new acquisition programs of record. As noted by the National Research Council in its most recent assessment of the Department of Defense SBIR program in 2014, these projects are highly successful at commercialization. Data from that study indicates that about 70 percent of Department of Defense Phase II projects reach the market. In addition, these projects “are in broad alignment with the agency’s mission needs,” and result in broader impacts on the innovation ecosystem, such as strong linkages with universities, support for graduate students, and licensing of technology from universities.

The committee is concerned that the Department of Defense is not fully utilizing the scope of the unique authorities embedded in the SBIR legislation. In addition to potentially shortening acquisition cycle time, SBIR can be useful in leveraging the innovation of the small business community and growing new technology areas. A good example of the benefits of the SBIR program is the Navy’s Automated Test and Retest (ATRT) Initiative, which has demonstrated impressive results in reducing the time, reducing the cost, and improving the quality of fielding new capabilities by performing research, development, and application of automated testing technologies for the test and evaluation of Naval warfare systems. The committee believes that the valuable lessons from such activities as ATRT should be more widely leveraged across the Navy and the rest of the

Department of Defense. The committee believes it is especially important to make sure that program managers and contracting officers are fully cognizant of the unique authorities SBIR provides, and are duly encouraged to be as flexible and creative as possible in utilizing those authorities.

Accordingly, the committee directs the Under Secretary of Defense for Acquisition, Technology, and Logistics to brief the House Committee on Armed Services by November 1, 2015, on the Department's plans for improving the use of SBIR authorities. This briefing should address how to better educate program managers and contracting officers on the special authorities of SBIR, any recommendations for how to improve or strengthen those authorities, metrics for assessing the use of SBIR authorities, and a process for integrating lessons learned from past successes like ATRT into future acquisition program planning and workforce development for the relevant communities.

#### *Barking Sands Tactical Underwater Range*

The budget request contained \$39.1 million in PE 24571N for consolidated training systems. Of this amount, no funds were requested for research and development to upgrade the anti-submarine warfare (ASW) underwater range instrumentation needs at the Barking Sands Tactical Underwater Range at the Pacific Missile Range Facility in Hawaii.

The committee recognizes that the military's ability to conduct advanced ASW training is a critical aspect of our military technological superiority. The Barking Sands Tactical Underwater Range, which was designed, manufactured, and installed in 1994, is the largest underwater instrumented range in the world, and covers over 1,100 square nautical miles. However, the committee is very concerned that the current system is beyond its 20 year design life, and rapidly becoming difficult to operate, repair, and maintain. Senior leaders within the Nation's submarine community have been on record since 2012 calling for a range replacement to begin in order to maintain worldwide ASW fleet readiness and superiority. To support such efforts, the committee directs the Secretary of the Navy to provide a briefing to the House Committee on Armed Services by March 1, 2016, on the Secretary's plan to meet this longstanding fleet requirement. The briefing should address the technology and instrumentation upgrade needs for the range with projected funding needs by fiscal year, a preliminary schedule of key milestones, and a fully competitive acquisition strategy to meet submarine fleet readiness requirements.

Additionally, the committee recommends \$54.1 million, an increase of \$15.0 million, in PE 24571N to support upgrading the ASW underwater range instrumentation needs at the Barking Sands Tactical Underwater Range.

#### *Continuation of Brimstone missile assessment*

The Brimstone missile is an air-launched ground attack missile in use by the United Kingdom of Great Britain and Northern Ireland's Royal Air Force. The

committee notes that the Brimstone missile has a dual-mode seeker which is capable of both active radar homing and laser guidance which allows for precision attack against moving targets, and has been used in combat operations in the Islamic Republic of Afghanistan, Libya, and in current operations in the Republic of Iraq.

The committee understands that defending against swarms of small enemy boats, known as fast inshore attack craft, from strike fighter aircraft, maritime patrol aircraft, and helicopters is a challenging mission for the Department of the Navy, and the committee believes that the Brimstone missile may be a solution to address this threat. Additionally, the committee believes that the Brimstone missile could be used for close air support missions.

The committee supports the use of funds authorized and appropriated for fiscal years 2014 and 2015 which are being used to provide the analysis needed to determine if the Brimstone missile is suitable for the F/A-18 aircraft carrier environment. If found suitable, the committee urges the Department of the Navy to use all available funding options, including the use of prior year funds, to expedite integration and fielding of the Brimstone missile on F/A-18E and F Super Hornet aircraft. The committee also notes that on April 20, 2015, the Navy initiated a request for information (RFI) as a market survey tool to solicit industry input to support possible future acquisition planning for a direct-attack, fire-and-forget weapon for F/A-18E/F Super Hornet aircraft. The committee understands the RFI indicates a planned initial operational capability in 2023, with a possible planned funding start for the multi-mode missile in fiscal year 2017. The committee encourages full and open consideration of all suitable solutions to meet this proposed planned schedule as part of the RFI.

#### *F414 Engine Noise Reduction Research and Development*

The committee supports Department of Defense efforts to reduce noise-related injuries and conditions that impact significant numbers of active-duty and former members of the military. Specifically, the committee supports ongoing Navy research and development efforts related to the F414 engine, which is used in the F/A-18 E/F Super Hornet and EA-18G Growler aircraft. The committee notes, however, that testing conducted by the Navy in October 2014 using chevron engine nozzle attachments did not achieve the hoped for noise reduction results. The committee directs the Secretary of the Navy to provide a briefing not later than September 30, 2015 to the House Committee on Armed Services on the status of F414 engine noise reduction research and development activities. The briefing should include details on recent F414 engine noise reduction efforts and other Navy noise reduction research and development activities and programs.

#### *Five-inch precision guided projectile development for naval surface fire support*

The budget request included \$0.9 million in PE 63795N for Land Attack Technology, but contained no funding for 5-inch guided projectile development and demonstration.

The committee understands the Navy has recognized that current surface Navy gunnery requirements are outdated and that new technologies such as railgun and directed energy weapons are nearing readiness for technology transition. The committee commends the Navy for initiating a review of naval surface fires requirements and for establishing the Advanced Naval Surface Fires (ANSF) initiative. The committee understands the ANSF initiative would conduct a capabilities assessment and review of all surface Navy requirements related to self-defense, anti-surface warfare, naval surface fires support, strike warfare, counterintelligence, surveillance and reconnaissance, and integrated air and missile defense.

The committee is particularly interested in the ANSF efforts related to naval surface fires support. The committee notes the ANSF is assessing options for providing a near-term 5-inch guided munition capability. The 5-inch guided munition would be used for improved and extended range naval surface fire support. The committee is aware the Navy has issued a request for information to industry regarding this capability and has received several responses that could create the environment for a full and open competition. The committee believes this technology could significantly improve naval surface fires support capability and could potentially be quickly introduced into the fleet given potential mature technology readiness levels.

The committee recommends \$10.9 million, an increase of \$10.0 million, in PE 63795N to accelerate the development and demonstration of 5-inch guided projectile technology for naval surface fires support.

### *Fully homomorphic encryption*

The committee is aware of the work done by the Defense Advanced Research Projects Agency (DARPA) in the Programming Computation on Encrypted Data (PROCEED) program to develop methods that allow computing with encrypted data without first decrypting it. One such method, fully homomorphic encryption, could theoretically allow for that, but is limited by impractically slow computational speeds. The DARPA PROCEED program, as well as other work being done by the Navy through the Office of Naval Research and the Space and Naval Warfare Command, is pursuing methods to make such cyber security methods more practical and implementable. As a result of these efforts, new approaches for secure cloud computing and cybersecurity are maturing and moving into practical use. The committee recognizes that these design, development, and implementation activities are costly, yet necessary for forward progress. The committee is also aware that the Navy and Marine Corps have identified the need to develop and apply fully homomorphic encryption, particularly for protecting safety-critical cyber systems and reducing leakage of information to our adversaries.

Such goals are critical not only to properly securing our nation's computers, but also to protecting sensitive data. Therefore, the committee encourages the Navy and Marine Corps to continue research into fully homomorphic encryption and to examine additional areas related to implementation, integration, and software tooling support.

#### *National Sea Based Deterrence Fund*

The committee notes that the National Sea Based Deterrence Fund (NDSF) was created by the Carl Levin and Howard P. "Buck" McKeon National Defense Authorization Act for Fiscal Year 2015 (Public Law 113-291) to address a congressional determination that the recapitalization of the *Ohio*-class ballistic missile submarine was a national strategic imperative. The committee also notes that the recapitalization of this strategic asset is currently estimated at \$95.77 billion. The committee believes that this acquisition program will have an extraordinary and detrimental impact to investments in the shipbuilding and construction, Navy, account if traditional funding levels of this account are sustained. The committee also believes that the entirety of the Department of Defense investment capabilities need to be used to recapitalize this strategic asset.

Therefore, the committee recommends the transfer of \$1.39 billion for the Navy *Ohio*-class ballistic missile submarine replacement program from the research, development, test, and evaluation, Navy, account to the National Sea Based Deterrence Fund, Department of Defense account.

#### *Navy communications experimentation*

The committee is aware that the Commander, Navy 7th Fleet is testing a broadband system that provides cellular-based, fourth generation long-term evolution (4G LTE) and broadband satellite communications to Navy ships. This Navy broadband effort could potentially improve the communications capabilities of naval platforms and promote information sharing and real-time collaboration in an emergency situation. Since this capability is built on commercial technologies, it could be rapidly fielded to improve the readiness, tactical communications, and morale, welfare, and recreation capabilities of the Navy. In light of the results from the recently completed Trident Warrior 15 Experimentation, the committee encourages the Navy to continue to examine the continued and expanded use of mobile broadband 4G LTE technology.

#### *Requirements maturation and developmental planning*

The committee is aware that the Air Force maintains a program element line within its science and technology (S&T) budget for Requirements Analysis and Maturation. This activity is used to fund developmental planning and integrated simulation and analysis capabilities that are used to inform programs before they formally enter the acquisition process. Such activities might include: early systems

engineering to comprehend capability needs, formulate and evaluate viable concepts, define trade space, assess technical risks, and identify technology needs. The committee recognizes that such work is very useful in providing a solid analytic basis for cost and capability trades that inform weapon systems requirements, acquisition milestones, decision points, and other phases. The committee believes that such support, which is at a small funding level at this stage, can provide huge benefits in risk reduction and cost avoidance for programs once they mature. The committee encourages the Navy to pursue similar developmental planning efforts, including dedicated S&T funding lines, to support such activities to inform programs of record.

#### *Service life extension program for Auxiliary General Purpose Oceanographic Research*

The budget request contained \$42.2 million in PE 62435N for the Ocean Warfighting Environment Applied Research program.

For academic research, the Navy operates and maintains Auxiliary General Purpose Oceanographic Research (AGOR) vessels. Three of these vessels require a mid-life overhaul, partial funding for which was provided in the Consolidated and Further Continuing Appropriations Act, 2015 (Public Law 113–235). The committee notes that funding provided to date does not fully support all of the items that the Navy has determined are necessary to fully extend the life of these AGOR ships to 40–45 years.

Accordingly, the committee recommends \$62.2 million, an increase of \$20.0 million, in PE 62435N for Ocean Warfighting Environment Applied Research, to procure the entirety of a mid-life overhaul. The committee notes that the inclusion of this authorization of appropriations is predicated on the Navy's use of merit-based selection procedures in accordance with the requirements of section 2304(k) and 2374 of title 10, United States Code, or on competitive procedures, to conduct these overhauls.

The committee continues to believe that oceanographic research is a core function of the Navy, and remains committed to ensuring the ability of the Navy to sustain its research priorities, even in the face of fiscally constrained budgets. The committee is concerned that the Navy has been decreasing funding in oceanographic research, especially sea-going research, and is concerned about the negative long-term implications these trends are likely to have on areas like anti-submarine warfare and battlespace awareness. Navy science and technology funding also plays a key role in information stewardship, including ocean mapping, oceanographic and meteorological data, that supports Navy, national, and international scientific goals.

#### *Spectral Warrior*

The committee understands that U.S. Navy surface combatants are experiencing a significant increase in friendly and adversary satellite

communications (SATCOM) interference events that could result in a degraded fleet mission capability. Ensuring the protection and connectivity of satellite communications for command and control, navigation, and ship protection should be an operational priority. The committee commends the Navy for fielding systems like Spectral Warrior that detect, characterize, and report all SATCOM interference events, although the committee is concerned that the quantity of systems being fielded may not meet the operational need. The committee encourages the Navy to develop requirements and fund a program of record that leverages currently fielded Spectral Warrior technologies to meet critical SATCOM assurance requirements.

#### *Tactical Combat Training System program*

The budget request contained \$39.1 million in PE 24571N for Consolidated Training System Development. Of this amount, \$19.3 million was requested for the Tactical Combat Training System (TCTS) program.

The committee notes that the TCTS Increment II is a Navy program that will address important training range capability gaps. The committee also notes that as part of a separate, earlier Department of Defense program, the Department has developed the Common Range Integrated Instrumentation System (CRIIS) to provide a joint test and evaluation system. While the requirements for the systems are not identical, the committee understands that the CRIIS may require only minimal software and hardware changes to meet the requirements for the TCTS Increment II training system. As a result, the committee encourages the Department of the Navy to consider adapting the CRIIS program, if it has the potential to meet requirements and affordability targets, to provide the capability the Navy is seeking to field through the TCTS Increment II program.

The committee recommends \$39.1 million, the full amount requested, in PE 24571N for Consolidated Training System Development, including \$19.3 million for the Tactical Combat Training System program.

#### *Unmanned carrier aviation*

The committee notes that the Secretary of Defense has initiated an intelligence, surveillance, and reconnaissance (ISR) portfolio review to assess the merits of the entirety of Department of Defense assets that may be available to support combat operations. This review is being augmented by a U.S. Navy tactical aviation analysis to determine the characteristics and quantities of carrier based ISR unmanned aviation systems (UAS) necessary to optimize the overall carrier air wing. The committee also notes that section 217 of the Carl Levin and Howard P. "Buck" McKeon National Defense Authorization Act for Fiscal Year 2015 (Public Law 113-291) included:

(1) A limitation on funding associated with the Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS) air vehicle until the Secretary of Defense certifies that a review of requirements associated with the

UCLASS air vehicle is complete and submits the results of such a review to the congressional defense committees; and

(2) A requirement for the Secretary of the Navy to prepare a report to assess the overall carrier air wing composition to include UCLASS, the support offered by non-organic naval aviation forces such as MQ-4C Triton, and the intended capabilities offered by FA-XX, which is the replacement aircraft for the F/A-18 E/F aircraft.

The committee believes that sea-based, long-range strike capabilities have incontrovertible merit and have been an integral element of U.S. carrier air wings in the past. Looking ahead, this capability may be the most important capability that the aircraft carrier can provide in contested environments and anti-access/area-denial scenarios. The committee believes that pursuit of a long-range penetrating strike capability should therefore be a critical focus of naval investments. The committee also believes that the capabilities offered by unmanned aviation may be the only capability that can support this mission requirement.

The committee notes that the majority of naval aviation missions do not require the same high-end characteristics required for long-range penetrating strike missions. The committee recognizes that an unmanned aircraft with not all of the attributes of a high-end UAS may be a more economical and sustainable means of conducting persistent ISR, aerial refueling, and strike missions in low-to-medium threat environments. The committee also recognizes that the Navy has a validated capability gap in regard to ISR and encourages the Department of Defense to meet this requirement in an economical and efficient manner.

Considering all of the options available to the Navy to augment the future carrier air wing, the committee believes that the continued development of the UCLASS program as a long-range penetrating strike capability best meets the future carrier air wing requirements and will address a much needed capability deficiency in the current carrier strike design.

Finally, the committee notes that the budget request included continued development of the UCLASS program, but does not include funds for the air vehicle. The committee encourages the Secretary of Defense to expeditiously complete the ISR portfolio analysis review and provide the proposed UCLASS Capabilities Development Document (CDD) to the congressional defense committees. If the CDD is not provided by August 31, 2015, the committee directs the Secretary of the Defense to provide a briefing to the House Committee on Armed Services by September 1, 2015, as to the terms of reference and an assessment that the Navy has the resources available and a strategy to deliver those required UCLASS capabilities. At a minimum, this brief should also include:

- (1) An updated cost estimate;
- (2) A schedule for holding a milestone B review and establishing an acquisition program baseline before initiating system development;

(3) Plans for new preliminary design reviews or delta preliminary design reviews and technology maturation if more demanding requirements are validated; and

(4) What consideration is being given to adopting an evolutionary acquisition approach.

## RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, AIR FORCE

### Overview

The budget request contained \$26.47 billion for research, development, test, and evaluation, Air Force. The committee recommends \$25.95 billion, a decrease of \$515.7 million to the budget request.

The committee recommendations for the fiscal year 2016 research, development, test, and evaluation, Air Force program are identified in division D of this Act.

### Items of Special Interest

#### *Adaptive engine transition program*

The budget request contained \$246.5 million in PE 64858F for the adaptive engine transition program (AETP).

The committee supports the continued emphasis on research and development in the next generation of turbine engine technology. AETP is a competitive acquisition program that builds upon current research efforts and is designed to mature adaptive turbine engine technologies for next-generation propulsion systems. In addition to goals for significant fuel savings, the committee understands that AETP offers improvements in range and persistence, increased thrust, and improvements in thermal management capacity that cannot be achieved by improving existing engines. The committee believes that the program will leverage existing adaptive turbine engine science and technology demonstrations to develop an adaptive engine built around a broad suite of technologies. Many of these technologies share commonality with the latest commercially developed engines, which will enable multiple follow-on high confidence competitive acquisition programs. The committee notes that there are potential applications of this technology to both legacy and future combat aircraft. The committee encourages the Department of the Air Force to continue to make the necessary investments in these critical technologies to maintain technological superiority over any potential adversary.

Therefore, the committee recommends \$246.5 million, the full amount requested, in PE 64858F for the AETP program, and encourages the Air Force to explore acquisition strategies to accelerate the program.

#### *Advanced manufacturing for low-cost sustainment*

The budget request contained \$42.6 million in PE 63680F for the Air Force manufacturing technology program, but contained no funding to mature advanced additive manufacturing technologies to address the cost and sustainment challenges for aerospace applications.

The committee is aware that the defense sustainment community has identified additive manufacturing as a means to dramatically lower the cost of maintaining aging weapon platforms. Additive manufacturing, more commonly known as 3D printing, allows the manufacture of a part with speed, flexibility, and little waste of materials. Currently, the Air Force uses additive manufacturing for design iteration, prototyping, tooling and fixtures, and for some noncritical parts. However, the committee recognizes that in the future the Air Force hopes to use additive manufacturing for building actual aerospace parts, such as fuel nozzles and heat exchangers. The committee believes that additional research needs to be done to validate the flight safety and integrity of such 3D printed parts to be able to reap the full benefits of this technology.

Therefore, the committee recommends \$52.6 million, an increase of \$10.0 million, in PE 63680F to support the maturation of advanced manufacturing for low-cost sustainment that meets the performance requirements of aerospace applications.

#### *Advanced pilot training family of systems*

The budget request contained \$11.34 million in PE 65223F for the advanced pilot training (T-X) program.

The committee supports the direction the Department of the Air Force is taking with the acquisition of a new trainer aircraft. Specifically, the committee supports the Department's approach to bundle the advanced pilot training system which would keep the aircraft, simulator, and courseware together, providing significant cost savings to the warfighter and taxpayer. Given the Department's planned retirement of the T-38 in the late 2020s, the committee urges the Department of the Air Force to maintain a stable schedule, including potential initial operational capability in 2023.

The committee recommends \$11.34 million, the full amount requested, in PE 65223F for the advanced pilot training (T-X) program.

#### *Air Force Minority Leaders Program*

The committee is aware that the Air Force maintains a program called the Air Force Minority Leaders Program, which partners a small disadvantaged business with students, teachers, and professors from historically black colleges and universities and minority institutions (HBCU/MI) to perform Air Force research tasks. The Air Force Minority Leaders Program is the largest Department of Defense research program that works with historically black colleges, and has been successful at promoting valuable research for the Department, as well as increasing

the pipeline of minority scientific talent for future Air Force jobs and strengthening the scientific and educational infrastructure in the minority community.

The committee encourages the Air Force to continue investing time, personnel, and resources in supporting research activities that can be conducted by the Air Force Minority Leaders Program to meet critical defense capabilities, science and technology, future workforce, and technical program objectives for the Air Force. Additionally, the committee urges the Air Force to find ways to expand the research areas in which the Air Force Minority Leaders Program can participate, as well as the ways in which to leverage the knowledge, skills, and expertise of those minority scientists and engineers engaged with that program.

#### *Airborne sensor data correlation*

The budget request contained \$68.3 million in PE 64759F for major test and evaluation investment, but contained no funding for development of airborne sensor data correlation.

Airborne sensor data correlation is a research project to prototype fusing unmanned aerial system electro-optical and infrared full motion video to support accurate over-water weapons impact scoring. The committee understands that future testing for hypersonic and long-range weapons will require large test areas and larger hazard areas that could require dynamic re-planning and monitoring, and that current range instrumentation systems are limited to small target test areas, fixed sensors, and environmental restrictions. The committee believes that an airborne sensor data correlation project can support dynamic test measurement requirements over large target areas as range footprints are expanded to support the testing of longer range weapons.

Accordingly, the committee recommends \$73.3 million, an increase of \$5.0 million, in PE 64759F for airborne sensor data correlation.

#### *B-52 radar modernization program*

The budget request contained \$74.5 million in PE 11113F for B-52 squadrons, but contained no funding for the B-52 radar modernization program (RMP).

In the committee report (H. Rept. 113-446) accompanying the Howard P. “Buck” McKeon National Defense Authorization Act for Fiscal Year 2015, the committee encouraged the Secretary of the Air Force to begin the B-52 RMP, then known as the B-52 strategic radar replacement program, and is disappointed to note that the Secretary has opted not to include funds for this purpose for fiscal year 2016. Based on a Department of the Air Force report to the congressional defense committees in 2013, the committee continues to believe that a B-52 RMP is a lower cost option than sustaining the current radar over the projected service life of the B-52, especially in light of the prospect that sustainment costs for the B-52’s legacy radar system are likely to significantly increase after 2017 based on obsolescence and diminishing manufacturing sources.

Accordingly, the committee continues to encourage the Secretary of the Air Force to include funding in the fiscal year 2017 budget request that would begin replacement of the B-52 legacy radar system, and expects that B-52 budget briefings for fiscal year 2017 to the congressional defense committees will address the Department of the Air Force plan to replace the B-52 radar.

#### *Conformal phased array antennas*

The committee notes that there have been recent substantive improvements in antenna technology, providing enhanced capabilities to aircraft and unmanned aerial systems. Additionally, the committee is aware that these same platforms face environments where it would be useful for antennae to operate on different frequency bands and to be reconfigurable while in flight. The committee believes that these enhanced capabilities could be critically important in improving sensing in constrained or contested aerial environments. The committee encourages the Air Force to examine research opportunities to develop the fundamental theory, modeling, and demonstration of super-adaptable conformal phased array antennas.

#### *Digital polarimetric radar development*

The committee notes that there have been major advances in the field of radar development with respect to incorporating both polarimetric and phased array radar technology in an all-digital design. The committee considers the development of this technology as a critical enabler for the Air Force in the development of increased weather sensing, as well as discrete object tracking capabilities. The committee encourages the Air Force to examine research opportunities to create an all-digital polarimetric phased radar for future use in discrete object sensing and tracking and concurrent use for weather observations.

#### *Experimentation program*

The committee is aware that the Army, Navy, and the Office of the Secretary of Defense have all begun to implement funded program element lines to support increasing developmental and operational experimentation. The committee believes that such activities are extremely valuable to iron out technology challenges, identify areas of risk, refine operating concepts, and gain warfighter trust and confidence in untested systems. As noted elsewhere in this report, the committee is aware of numerous historical examples where experimentation with new technologies in peacetime paved the way for their adoption and effective use in wartime. The committee believes that increasing experimentation can be pivotal in laying the foundations for successful technology adoption by the warfighting community. Therefore, the committee encourages the Air Force to establish a similar program element funding line for experimentation to allow for greater

flexibility to conduct such experimentation in the future and support transition of technology from the laboratory to the operational force.

#### *F-16 active electronically scanned array radar upgrade*

The budget request contained \$148.3 million in PE 27133F for F-16 squadrons, but contained no funding to conduct integration and testing for an F-16 active electronically scanned array (AESA) radar upgrade.

The committee notes that, despite the termination of the combat avionics programmed extension suite (CAPES), the Department of the Air Force is considering a new effort to upgrade F-16 radars from the current APG-68 system to a modern AESA radar system. Further, the committee understands that this potential radar upgrade program is based upon a developing joint operational urgent need (JOUN) that specifically requires an AESA radar upgrade to the F-16 aircraft that perform the aerospace alert control mission. The committee supports taking all appropriate steps to meet this JOUN as soon as possible.

The committee expects the Department of the Air Force to minimize program concurrency between development, testing, and production for any such F-16 AESA radar upgrade. Specifically, the committee expects the Department to proceed in a manner that ensures proper integration and testing of radar upgrades so that the AESA upgrades meet requirements.

Accordingly, the committee recommends \$198.3 million, an increase of \$50.0 million, in PE 27133F to conduct integration and testing for an F-16 AESA radar upgrade, and encourages the Department of the Air Force to budget for development and procurement of this upgrade in the Future Years Defense Program.

#### *F-35 dual-capable aircraft development program*

The Department of the Air Force budget request contained \$518.0 million in PE 64800F for development of the F-35A, of which \$5.0 million was for dual-capable aircraft development. As a dual-capable aircraft, the F-35 would be capable of performing both the conventional and nuclear weapons delivery missions.

The committee notes that the F-35 dual-capable aircraft development program is part of the F-35 block 4 software program which will be completed subsequent to the conclusion of the system development and demonstration program, and will be released in increments known as blocks 4.1, 4.2, 4.3, and 4.4 with initial operational capability dates of each of those four blocks planned to occur between 2019 and 2025. The committee understands that the dual-capable F-35 aircraft would be included in block 4.3 or 4.4 to replace the aging F-16 aircraft which is currently performing the dual-capable aircraft mission.

The committee recommends \$5.0 million, the full amount requested, in PE 64800F for the F-35 dual-capable aircraft development program, and encourages the Department of the Air Force to accelerate the completion of the F-35 dual-capable aircraft development program in future budget requests.

### *Fifth generation tactical data link enterprise*

The committee notes that the data links for the Department of the Air Force's two fifth generation aircraft, the F-22 and the F-35, are proprietary, and are not interoperable, rendering these data links incapable of sharing data between these two types of aircraft. The committee understands that the Department of the Air Force intends to address this problem by using a separate data link, known as Link 16, which is currently in use by fourth generation aircraft. The committee further understands that Link 16 could be vulnerable in higher threat, anti-access and area denial environments.

The committee believes that over the long term, the Department of the Air Force will need to upgrade the propriety data links to a non-proprietary next-generation waveform, or provide the industry associated with developing and producing data links the technical data packages for the current waveforms so that competition and innovation can be sustained. Accordingly, the committee encourages the Department of the Air Force to pursue competitive development and production of data links to provide for a future robust and innovative data link industrial base.

### *KC-135 auto throttles*

A KC-135 auto throttle system would allow a pilot to automatically set aircraft throttle settings to maximize fuel consumption for a given power setting to attain a specific indicated airspeed, instead of manually doing so. The committee understands that installation of a KC-135 auto throttle system would reduce cockpit workload, increase crew situational awareness, and result in a 3 percent fuel savings. The committee further understands that based on fuel savings, investment in such an auto throttle system could be recouped in as few as 4 years. The committee notes that other Air Mobility Command aircraft such as the KC-10, C-17, C-5, and KC-46 are also equipped with similar auto throttle capability.

Therefore, the committee urges the Department of the Air Force to begin a program for the development and production of a KC-135 auto throttle system.

### *KC-46 aerial refueling tanker aircraft program*

The budget request contained \$602.4 million in PE 65221F for KC-46 tanker development and \$2.35 billion for procurement of 12 KC-46 tanker aircraft. The KC-46 tanker aircraft is being developed and procured to replace the aging Department of the Air Force KC-135 and KC-10 aerial refueling tanker fleets.

The committee continues its long-standing support of the KC-46 tanker aircraft program, and believes that the KC-46 tanker aircraft is necessary to meet current and future warfighter requirements for aerial refueling and airlift. However, the committee notes that Government Accountability Office (GAO) identified \$200.0 million of funds authorized and appropriated for fiscal year 2015 for KC-46 development that have been determined excess to need because

engineering change orders planned for fiscal year 2015 have not occurred, and these funds could be used to meet fiscal year 2016 requirements. The committee further notes that the GAO has also identified \$24.0 million of fiscal year 2015 KC-46 procurement funds that are excess to need for a similar reason, which could also be used to meet fiscal year 2016 requirements. Department of the Air Force KC-46 program officials have verified that the GAO's determination is correct.

Consequently, the committee recommends \$402.4 million, a decrease of \$200.0 million, in PE 65221F for KC-46 tanker development, and \$2.32 billion, a decrease of \$24.0 million, for KC-46 procurement.

### *Long-range strike bomber*

The Department of Defense has indicated that it intends to pursue the acquisition of future long-range strike capabilities for operating in anti-access/area denial environments. According to the budget request for fiscal year 2016, the Secretary of Defense expects to significantly increase annual investments in long-range strike development over the next 5 years, with investments from fiscal year 2016-20 projected to total nearly \$14.00 billion. The acquisition of a new bomber is one of the key elements in the Department's planned long-range strike investments.

Given the size of the planned investments and the strategic importance of successfully acquiring a new bomber, the committee directs the Comptroller General of the United States to conduct a review of the U.S. Air Force bomber acquisition program and to provide a briefing to all appropriately cleared Members and Professional Staff of the House Committee on Armed Services by March 1, 2016, on the findings of the review. Specifically, the Comptroller General shall include an examination of the bomber program's technology maturity in comparison with other Air Force acquisition programs at similar milestone events. This brief should also include an examination of the Air Force's: (1) overall acquisition strategy; (2) technology, design, and production readiness; (3) development, testing, and fielding progress; (4) cost and schedule implications; and (5) technical performance.

The committee expects the Secretary of the Air Force shall ensure timely access to the necessary program information including, but not limited to, cost and budget information, detailed schedules, contractor data, program management reports, decision briefings, risk and technology readiness assessments, and technical performance measures.

We encourage the Comptroller General to consider providing, when practical and feasible given security limitations, an annual unclassified summary of the program's status and risks.

### *Long-range strike bomber program*

The budget request contained \$1.25 billion in PE 64015F for the long-range strike bomber (LRS-B) program. The LRS-B program is developing a new bomber

aircraft that will be a long-range, air-refuelable, and highly survivable aircraft with significant nuclear and conventional stand-off and direct-attack weapons payload.

The committee continues its long-standing support of the LRS-B program and believes that the LRS-B aircraft is required to address future threats. However, the committee notes that selection of a contractor to begin the LRS-B engineering and manufacturing development (EMD) program has been delayed 4 months. The committee further notes that, according to program officials, this delay has resulted in an excess of \$360.0 million of funds authorized and appropriated for fiscal year 2015 that could be used to meet requirements for fiscal year 2016, and an excess of \$100.0 million budgeted for fiscal year 2016 that will not be used due to a slower spend rate in the EMD program during fiscal year 2016.

Consequently, the committee recommends \$786.2 million, a decrease of \$460.0 million, in PE 64015F for the LRS-B program.

*Next Generation Joint Surveillance Target Attack Radar System Electro-Optical, Infrared Sensor Capability*

The committee believes that the Air Force should consider, as part of the requirements for the Next Generation Joint Surveillance Target Attack Radar System (JSTARS), an integrated electro-optical / infrared (EO/IR) search capability. The committee notes that such a system could assist with precise identification of targets at extended ranges, which would provide tactical advantages to deployed forces. The committee further notes that EO/IR capability is already in very high demand and that adding this capability to Next Generation JSTARS may enable the platform to provide additional intelligence support capability. The committee directs the Secretary of the Air Force to provide a briefing to House Committee on Armed Services by March 1, 2016, on the potential utility of an integrated EO/IR capability on Next Generation JSTARS aircraft. The briefing should also include the potential cost and schedule impacts of adding such a capability to the Next Generation JSTARS development program.

*Next Generation Joint Surveillance Target Attack Radar System operational concepts*

The budget request contained \$44.3 million in PE 37581F for the Next Generation (NextGen) Joint Surveillance Target Attack Radar System (JSTARS) program.

The committee is aware that the Department of the Air Force has a requirement for a new manned command-and-control/intelligence, surveillance, reconnaissance aircraft given that the current, high-demand E-8C JSTARS aircraft are facing low availability rates, end-of-life issues, and growing sustainment costs. The committee encourages the Air Force to take into consideration a platform that is able to grow and adapt for unknown future threats and game-changing technologies.

In addition, the committee would like to better understand the relationship between the system requirements and how the Department of the Air Force intends to employ JSTARS in the future. Therefore, the committee directs the Secretary of the Air Force to provide a briefing to the House Committee on Armed Services by February 29, 2016, detailing the planned operational mission concepts for the NextGen JSTARS. This briefing should include, but not be limited to, how the aircraft and mission system will be employed in various phases of peacetime and combat operations. Additionally, the briefing should explain concepts for mission training, aircraft maintenance, force protection, aircraft security, crew manning, and future sustainability and modernization to include growth margin.

The committee recommends \$44.3 million, the full amount requested, in PE 37581F for the NextGen JSTARS program.

### *Technology transfer*

The budget request contained \$3.5 million in PE 64317F to facilitate the transfer of technology from the Department of Defense to industry for both commercial and military use.

The committee is aware that the technology transfer program was devolved from the Office of the Secretary of Defense to the Air Force in 2012 in an effort to achieve efficiencies and increase the effectiveness of the program. Technology transfer is a critical strategy for the Department that allows it to license or patent government laboratory developed technologies to leverage the manufacturing, production, and marketing economies of scale of the private sector.

The committee believes that the Air Force should increase its investment in technology transfer efforts in order to improve the commercialization of intellectual property developed by the defense laboratories in support of critical cross-service technological needs such as human performance, cybersecurity, autonomous systems, unmanned vehicles, and rapid prototyping. The committee believes additional funding could expand the efforts to actively promote and broker cooperative research and development agreements (CRADAs) and partnership intermediary agreements (PIAs) between Department of Defense laboratories and industry, with a focus on non-traditional defense contractors.

The committee recognizes that one challenge to supporting this technology transfer process is the administrative support needed for development of CRADAs and PIAs and the protection of intellectual property for both the government and industry. The committee notes that the Air Force is particularly challenged by the need to periodically engage experienced patent attorneys with expertise in specific technology areas. The committee believes that the Air Force should consider establishing one or more PIAs as a mechanism capable of making adjustments to surges in work, or handling new and emerging technology areas where there may be little or no expertise within the government.

Therefore, the committee recommends \$13.5 million, an increase of \$10.0 million, in PE 64317F to support increased technology transfer activities within the Air Force, as well as the Department of Defense writ large.

#### *Three-Dimensional Expeditionary Long-Range Radar*

The budget request contained \$14.9 million in PE 27455F for the Three-Dimensional Expeditionary Long-Range Radar (3DELRR) program.

While the committee is aware that the 3DELRR program has been delayed by more than a year due to a protest of the engineering and manufacturing development (EMD) contract award, the committee still believes this is a critical program that will provide a much-needed upgrade to current Department of the Air Force long-range radar systems. As a result, the committee urges the Department of the Air Force to keep the program on its new schedule that should require a significant increase in funding for the EMD phase in fiscal year 2017.

The committee recommends \$14.9 million, the full amount requested, in PE 27455F for the 3DELRR program.

#### *Wide area surveillance*

The budget request contained \$50.2 million in PE 35206F for development of airborne reconnaissance systems, but contained no funding for development of wide area surveillance. The committee notes that persistent day and night wide-area motion imagery (WAMI) capability is flying in the Islamic Republic of Afghanistan, being readied to support operations in the Republic of Iraq, and is considered by operational commanders to be a critical intelligence, surveillance, and reconnaissance program for combat units that has contributed to saving U.S and allied soldiers' lives.

The committee notes the Department of the Air Force's November 2014 decision to designate WAMI capability as a program of record. However, the committee understands that this designation late in the calendar year did not allow the Department of the Air Force to program funds for fiscal year 2016. As a result of this situation, the committee is concerned that without funding in fiscal year 2016 to continue development of the multi-intelligence capable wide-area surveillance system, engineering teams will be reduced or disbanded, technical support to deployed systems will be impacted, and program improvement efforts will be reduced or terminated.

Accordingly, the committee recommends \$60.2 million, an increase of \$10.0 million, in PE 35206F for further development of WAMI.

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

Overview

The budget request contained \$18.32 billion for research, development, test, and evaluation, Defense-Wide. The committee recommends \$18.54 billion, an increase of \$217.2 million to the budget request.

The committee recommendations for the fiscal year 2016 research, development, test, and evaluation, Defense-Wide program are identified in division D of this Act.

### Items of Special Interest

#### *Advanced semiconductor platform*

The committee is aware that a technology capability gap potentially exists for full integration capabilities to manufacture the next generation of advanced semiconductor materials platforms for military systems. The committee recognizes that keeping a viable manufacturing production line of advanced semiconductor material platforms in the United States may be increasingly necessary because of its integration into wide-ranging capabilities such as military electronic, photonic, and energy systems for unmanned aerial vehicles, satellites, soldier equipment capabilities and other defense applications. The committee encourages the Department of Defense to consider investing in manufacturing capabilities for advanced semiconductor materials platform technology that are critical to our national defense, through direct investment or potentially as part of the Defense Production Act Title III program.

#### *Assessment of the directed energy industrial base*

The committee is aware of the growing importance of directed energy systems to future Department of Defense missions and operational concepts. As developmental programs continue to progress, and the potential for acquisition programs of record increases, the committee believes that it is important to have a better understanding of the industrial base for directed energy systems to understand if that sector can accommodate future growth in these areas. The committee recognizes that the ability of this sector to support future demand in the event that programs of record scale up could be a limiting factor to the expansion of these technologies. Though there are areas where the technology still needs to be tested and validated, the committee supports analysis of this area to ensure industry can meet the future needs of this emerging technology area.

Recognizing that the Department is required by section 2503 of title 10, United States Code, to have a program for industrial base analysis and under section 2505 to perform periodic defense capability assessments, the committee believes that the process exists to ascertain the strengths and weaknesses in this part of the industrial base. Therefore, the committee directs the Under Secretary of Defense for Acquisition, Technology, and Logistics to conduct an assessment of the directed energy industrial base and brief the results of this assessment to the House

Armed Services Committee by February 1, 2016. This assessment should include the following:

(1) A review of the technical domestic and international industrial capacity for components or subsystems for directed energy systems, including solid-state or fiber lasers; high quality optics, including large aperture optics and beam directors; components required for atmospheric compensation systems, including wavefront sensors and deformable mirrors; pulsed power and other energy systems; and power electronics, or other electronic subsystems.

(2) An assessment of current or planned research efforts of acquisition programs to determine if their technology needs can be met by the current directed energy industrial base; and

(3) Recommendations for ways of strengthening or otherwise supporting the directed energy industrial base.

### *Combating Terrorism Technical Support Office*

The budget request included \$71.2 million in PE 63122D8Z for the Combating Terrorism Technical Support Office (CTTSO).

The CTTSO identifies capabilities to combat terrorism and irregular adversaries and delivers these capabilities to geographic combatant commanders, the military services, the interagency, and international partners. The committee notes CTTSO's track record of success in demonstrating the effectiveness of technology when applied to combating terrorism and irregular warfare requirements, and that the CTTSO has most recently developed several capabilities to counter the growing threat being posed by Islamic State of Iraq and the Levant (ISIL). The committee remains concerned with the success of ISIL's messaging and propaganda, and its ability to persuade, inspire, and recruit from across the globe. ISIL's continued success on the battlefield depends on this messaging, and the group's propaganda attracts recruits and other support that enables the organization to persist. Consequently, the committee believes that the campaign to degrade and defeat ISIL on the battlefield must be coupled with a comparable effort to degrade and defeat ISIL's message in the minds of potential supporters. The committee believes that the CTTSO is uniquely positioned to help counter ISIL's narrative and battlefield successes, and to enhance U.S., allied, and international partner Information Operations capabilities to mitigate and marginalize ISIL's ability to influence and inspire. Elsewhere in this Act, the committee includes a provision that would provide additional authority for a pilot program to support information operations and strategic communications capabilities.

The committee urges the CTTSO to work with the combatant commands to provide technological and operational capabilities to support the tactical, operational, and strategic requirements of the combatant commanders. Further, the committee directs the Assistant Secretary of Defense for Special Operations and Low Intensity Conflict to brief the House Committee on Armed Services not later

than July 30, 2015, on additional counter-ISIL activities and initiatives being conducted by the CTTSO.

The committee recommends \$96.2 million, an increase of \$25.0 million, in PE 63122D8Z for the Combating Terrorism Technical Support Office for distinct and focused counter-ISIL efforts, global in nature, including support for geographic combatant commander information operations requirements.

*Comptroller General review of advanced semiconductors and microelectronics*

The committee recognizes that the development and delivery of critical capabilities of the Department of Defense, Intelligence Community, and other Government organizations are dependent, in part, on incorporating rapidly evolving, leading-edge semiconductors and microelectronic devices into their systems, including technologies for which there is no commercial demand. Once dominated by domestic sources, today's microelectronics manufacturing is largely conducted outside of the United States.

The committee is aware that foreign dependence on microelectronics may increase security risks, such as introduction of corrupt technologies into weapon systems, loss of national security-related intellectual property, and disruption of supply of critical microelectronics. For more than a decade, the Government has relied heavily on a single, U.S.-owned company for sensitive, leading-edge trusted microelectronics through the Trusted Foundry Program. However, the proposed acquisition of this firm's microelectronics fabrication facilities and related intellectual property by a foreign-owned entity creates uncertainty about the Government's future access to leading-edge trusted microelectronics and other advanced semiconductor materials and presents risk for Department of Defense programs that rely on these microelectronics.

Therefore, the committee directs the Comptroller General of the United States to assess the Department of Defense's actions and measures to address the risk of losing access to the source of trusted leading-edge microelectronics, and to submit a report on the findings to the House Committee on Armed Services by March 1, 2016. The report shall address the following:

- (1) What efforts have been made to identify the potential impacts to defense research and weapon systems' acquisition programs;
- (2) What actions, if any, have been taken by Department of Defense programs to mitigate the potential risk;
- (3) What actions, if any, have been taken to identify and acquire alternative sources of trusted leading-edge microelectronics, or to create new sources through Government investments, such as Defense Production Act investments; and
- (4) The use of new or innovative manufacturing techniques, such as split manufacturing, or other emerging capabilities.

*Comptroller General review of technology transition efforts of the Department of Defense*

The Department of Defense's science and technology enterprise is responsible for identifying, pursuing, and developing new and advanced technologies to improve and enhance military capabilities. The committee continues to be concerned, however, about the lack of technology transition that occurs between the Department's science and technology activities and acquisition programs of record. Previous studies by the Government Accountability Office (GAO) and others have identified a number of factors that contribute to this situation, including insufficient processes and mechanisms within the Department to conduct technology demonstration and testing, prototyping, and generally ensure that high-value technologies are mature and available to be incorporated into weapon system programs. In the past, the committee has expressed concern that the Department has not put sufficient emphasis on technology transition, but the renewed focus on warfighting experimentation to support transition and the effective use of the Rapid Innovation Program indicate that some progress may have been made. The committee also believes that funding for up-front acquisition activities, such as operational analysis to support requirements definition and maturation, modeling and simulation for trade space analysis, and funding to support technological maturation to get some activities through the "valley of death" also make potentially valuable contributions to supporting technology transition, though the impact of these activities needs to be better understood and the return on investment quantified.

The committee last asked the Department to assess its technology transition activities in 2008, but it took more than 3 years for that report to be completed. The committee believes that the landscape for technology transition has changed significantly in the intervening period, and a review by the GAO would provide a better understanding of the factors that affect successful technology transition, and what recommendations might be made to improve the Department's return on investment for technology transition.

The committee continues to be concerned that the way in which the Department of Defense funds technology transition activities, including funding for advanced component development and prototyping, as well as system development and demonstration activities, may be hampering the effective and timely transition of mature technologies into acquisition programs. Therefore, the committee directs Comptroller General of the United States to review how the Department's research and development funds are used and whether this approach to funding effectively supports technology risk reduction activities, operations analysis, prototyping, experimentation, and technology transition. The Comptroller General should submit a report on the review to the congressional defense committees by March 1, 2016. In addition, the Comptroller General should include recommendations for better ways for the Department to support the delivery of mature technologies to acquisition programs.

*Computational Research and Engineering Acquisition Tools and Environment*

The committee is aware of a program within the Office of the Secretary of Defense called the Computational Research and Engineering Acquisition Tools and Environment (CREATE). This program has developed and deployed multi-physics engineering software applications with increasingly capable high-performance computing systems, as well as existing simpler software tools, to accurately predict the performance of weapon systems in much shorter timeframes. CREATE's ultimate goal is to move the Department of Defense away from building and testing physical prototypes as the sole means to validate the performance of a system, to also include very robust virtual prototype design and evaluation, followed by the physical prototype validation needed to verify actual weapon performance and safety. The committee notes that tools such as these can be used to identify and help eliminate design defects and integration problems much earlier in weapon systems design and test processes, before major schedule and budget commitments are made, resulting in reduced acquisition time, cost, and risk. In separate studies, the Department has documented that each dollar invested in high-performance computing results in a return on investment at 7 to 13 times that investment. The committee supports such activities, and encourages the Department to continue investing in resources needed to develop the necessary software tools, as well as the integration of such tools into existing and new acquisition programs.

#### *Corrosion control and prevention*

The budget request included \$1.5 million in PE 64016D8Z for the Department of Defense Corrosion Program.

The committee continues to be concerned that the Department has consistently underfunded the Corrosion Program since fiscal year 2011 despite the fact that the Department estimates that the negative effects of corrosion cost the Department more than \$20.00 billion annually to prevent and mitigate corrosion of its assets, including military equipment, weapons, facilities, and other infrastructure. The committee is further concerned that the Department continues to under-resource this program despite clear congressional support as demonstrated by multiple fiscal year adjustments to the program's funding.

Accordingly, the committee recommends \$6.5 million, an increase of \$5.0 million, in PE 64016D8Z for the Department of Defense Corrosion Program.

#### *Department of Defense infectious disease research and development*

The committee recognizes the importance of the role of the Department of Defense in responding to a pandemic disease and training and protecting Department personnel deployed in a theater of operations consumed by infectious disease. In addition to response, the Department also plays a critical role in funding appropriate research, development, and technology efforts to treat and prevent the spread of infectious diseases, in coordination with other relevant government agencies. Many infectious diseases are spread through human-to-human contact and through animal-to-human contact known as zoonosis. Historically, the

Department has focused efforts on preventing human-to-human transmission of infectious diseases which pose a national security risk or a risk to deployed forces. The committee believes it is also important to understand zoonosis. The committee urges the Department to update efforts to identify emerging and expanding zoonotic infectious diseases around the globe which pose a national security risk or a risk to deployed forces and utilize competitive extramural research and existing national biosafety laboratories to enhance the Department of Defense's capabilities to prevent and respond to future global outbreaks or epidemics.

#### *Electronic Warfare Executive Committee*

The committee is aware that the Defense Science Board recently completed a report on electronic warfare (EW) that found "the Department of Defense has lost focus on electronic warfare at the programmatic and strategic level and should recreate the mechanisms needed to develop EW strategies, synchronize programs, and advise the Secretary and Deputy Secretary of Defense on EW matters." As a result, the Deputy Secretary of Defense has recently established an Electronic Warfare Executive Committee (EXCOM) to provide strategic focus and oversight on EW programs, especially at the points where EW and cyber are converging. The EW EXCOM will be co-chaired by the Under Secretary of Defense for Acquisition, Technology and Logistics and the Vice Chairman of the Joint Chiefs of Staff, with an initial focus on EW strategy, acquisition, operational support and security. The committee commends the Department of Defense for making such a strong move to improve oversight of all EW activities, and looks forward to hearing more from the Department about how it will operate and key recommendations it plans to make.

#### *Enhancing situation awareness for military aircraft*

The committee notes that there have been recent developments in commercial technologies that could enhance the situational awareness in aircraft by improving displays and implementing real-time information distribution, both inside and outside of the aircraft. These technologies can combine three-dimensional (3D) visualization using camera, thermal and satellite imagery, recording and networking capabilities into a single cockpit platform that could facilitate mission planning and execution. The committee believes that these additional capabilities could be critically important in the types of high-risk, high-difficulty missions executed by Special Operations. The committee encourages evaluation of these enhanced cockpit technologies for future use in Special Operations aircraft.

#### *High Power Directed Energy research*

The budget request included \$30.3 million in PE 63178C for Directed Energy research.

The committee is strongly in support of directed energy program development. The committee is aware of efforts under review by the Missile Defense Agency (MDA), including the Diode Pumped Alkali Laser and the Fiber Combining Laser. The committee notes that these programs are at different technology readiness levels, including some still requiring significant research and development to reach required power levels to be effective against certain threats.

The committee notes a significant increase, more than double, the amount requested by MDA in its fiscal year 2015 budget request. The committee also believes High Power Directed Energy programs would receive attention better focused on delivering anti-ballistic missile capability at the earliest practical date if they were reorganized within MDA. The committee recommends these activities be realigned under the MDA Director of Engineering and recommends a new program element for that purpose.

The committee recommends \$30.3 million, the amount of the budget request, in PE 63XXXC for Weapons Technology, High Power Directed Energy.

#### *Language Translation Technology*

The committee acknowledges that the work of the U.S. defense community integrally involves the ability to efficiently and accurately translate large volumes of documents and data, and to communicate and interact with multinational partners, security forces, and local indigenous populations in their native languages. The best available foreign language support services and technology products used by the relevant agencies in these communities can be critical factors to mission success, and the Department of Defense should ensure these services and technology products are available to servicemen and women who require translation technologies to perform their important missions. Therefore, the committee directs the Secretary of Defense, in coordination with Commander, U.S. Special Operations Command, to brief the House Committee on Armed Services by September 1, 2015, on the Department's language translation requirements and programs, including the use of commercial language translation technology.

#### *Multiple-Object Kill Vehicle*

The budget request for concept development and technology development related to the Multiple-Object Kill Vehicle was \$12.0 million in PE 63178C for the Weapons Technology program and \$44.6 million in PE 63294C for the Common Kill Vehicle Technology program.

The committee supports development of a Multiple-Object Kill Vehicle as part of the long-term improvement of the homeland ballistic missile defense of the United States. The committee also believes these efforts would be given the attention they need to successfully transition to a program of record and a deployable capability if they were realigned and reorganized within the Missile Defense Agency (MDA) and it recommends funding in a new program element to

accomplish those goals. Elsewhere in this Act, the committee includes a provision that would establish a Multiple-Object Kill Vehicle program of record within MDA.

The committee recommends \$86.5 million, an increase of \$30.0 million, in PE 63XXXC for the Multiple-Object Kill Vehicle program.

### *Report on the United States Special Operations Command Development of Directed Energy*

The committee recognizes that directed energy solutions have the potential to provide warfighters with an array of options beyond the strict limitations of kinetic systems. The committee believes that the United States Special Operations Command (USSOCOM) should continue to examine procuring or developing directed energy technology through their unique acquisition authorities. As the Special Operations Forces (SOF) community looks to utilize those special acquisition authorities, the committee recognizes that USSOCOM may need to utilize tailored or SOF-peculiar test and evaluation capabilities to support their urgent requirements.

Therefore, the committee directs the Commander of Special Operations Command to provide a briefing to the House Armed Services Committee no later than 180 days after the enactment of this Act on the command's need for a USSOCOM directed energy test and evaluation program. The briefing required should include:

- (1) An overview of the current structure, processes and requirements used to test and evaluate directed energy programs and a measure of performance in meeting time-sensitive warfighter requirements;
- (2) Recommendations for how to enable testing and evaluation of time-sensitive operational needs and mission requirements as part of the USSOCOM acquisition processes;
- (3) Recommendations for the requirements for a capable lab or testing entity to carry out such testing; and
- (4) An inventory of the tools and facilities that can meet the test and evaluation needs of USSOCOM for its directed energy programs.

### *Research and development work with biosafety facilities*

The committee recognizes that the biosafety level 4 (BSL 4) facilities are critical to medical and viral research, and provide advanced research opportunities that help protect warfighters from biological threats, and investigate outbreaks and threats to public health. These facilities, which include partnerships with non-profit entities, can assist in research to help prevent viral outbreaks such as Ebola, influenza and other similar biological threats.

While the committee understands that the most recent Ebola outbreak now appears to be contained, constant vigilance is still required. The Department of Defense's work in West Africa was critical in containing the spread of Ebola. The committee further recognizes that non-profit applied research institutes have

unique capabilities and expertise in areas important to the Department of Defense, such as, rapid small drug down-selection, formulation and supply under the appropriate regulatory controls housed in BSL 4 facilities, and capability required for ultimate delivery to the affected population, both military and civilian. Therefore, the committee directs the Secretary of Defense to brief the House Committee on Armed Services on their research and developmental work, to include partnerships with non-profit research facilities regarding potential renewed viral threats of especially dangerous pathogens by January 31, 2016.

#### *Ribonucleic acid technology research*

The committee recognizes that the Department of Defense faces significant challenges with infectious diseases, which hospitalize more service members each year than those wounded in combat. The recent outbreak of Ebola in Africa highlights the challenging environment that military forces will be faced with when operating in an environment of highly infectious diseases. The committee is encouraged by the progress the Defense Advanced Research Projects Agency (DARPA) has made to address the treatment for infectious diseases that can benefit our warfighters, as well as affected civilian communities throughout the world, based on techniques utilizing ribonucleic acid (RNA). The committee encourages the Director of DARPA to find new opportunities for expanding its research into new areas specifically for research and equipment that enable RNA target characterization, software development for in silico screening of molecule libraries against RNA targets, and assay development for in vitro high throughput screening and validations.

#### *Simulation training for emerging health threats*

The committee believes that new emerging threats in the form of highly infectious diseases such as the Ebola outbreak in West Africa highlight the need for new forms of training for military and civilian responders to mitigate the spread of these infectious diseases. The committee understands that Department of Defense-sponsored simulation training technologies can provide a full continuum of training methods that range from full-immersion to mixed-reality simulation, to distance-learning technologies and formats. The committee encourages the Department of Defense to continue to look into viable simulation training platforms that are portable, enable a full range of realistic training, and foster an in-depth experience that replicates real-world environments.

#### *Special Operations Forces Combat Diving Program*

The committee understands that U.S. Special Operations Command (USSOCOM) included within the budget request for fiscal year 2016 a new-start program called Special Operations Forces Combat Diving. The committee strongly supports inclusion of this program which is designed to provide for the

modernization and advancement of engineering, manufacturing, testing, development, and transition of special operations-peculiar diving technologies for special operations and combat divers. The committee encourages the aggressive and timely development of commercial and developmental underwater breathing technologies, diver thermal regulations systems, diver communications, tracking and monitoring systems, diver propulsion systems and devices, advanced concept breathing mixtures, and next-generation combat diver life supports systems and technologies.

The committee also encourages the Commander, U.S. Special Operations Command, to develop next-generation diver technologies, to ensure that these individual diver systems are matured in coordination with the development of USSOCOM's broader Undersea Mobility strategy, and in particular, the dry combat submersible platforms and prototypes currently being developed by USSOCOM. The committee also expects USSOCOM to leverage commercial technologies and advancements in this area when practical, and to continue coordination with similar research and development efforts underway within the Department of Defense. As such, the committee directs the Commander, U.S. Special Operations Command, to provide a briefing to the House Committee on Armed Services by July 30, 2015, on the development of technologies and capabilities within the Special Operations Forces Combat Diving Program.

#### *Strategic Capabilities Office transitions of technology*

The committee continues to monitor with interest the efforts of the Strategic Capabilities Office (SCO) to identify, analyze, and demonstrate promising concepts and capabilities to counter strategic adversaries. With technologies from SCO maturing and beginning to transition from demonstration to operation, the committee needs to have a better understanding of how those transitions are planned for and executed. The Joint Explanatory Statement (Committee Print No. 4) accompanying the Carl Levin and Howard P. "Buck" McKeon National Defense Authorization Act for Fiscal Year 2015 recommended the development of more robust processes to tie these efforts "to the needs, requirements and priorities of the combatant commands," as well as "an estimated cost to field the capability, if the demonstration proves successful, to support transition planning activities."

Recognizing that such investments are still in the demonstration phase, the committee believes it is important to do as much as possible to plan concurrently for the possibility of transition into a program of record for fielded capability. Therefore, the committee directs the Under Secretary of Defense for Acquisition, Technology, and Logistics to brief the House Committee on Armed Services by January 1, 2016, on the technology transition process for SCO activities. As part of the briefing, the Under Secretary should address the following issues:

- (1) The status of transition agreements with operational sponsors or service programs of record, including the threshold for performance for objective fielded capabilities needed to trigger or ensure transition;

- (2) The process for doing analysis of alternatives (AOA) for those demonstration capabilities to support proposed transition;
- (3) Cost estimation procedures to determine the funding benchmarks for objective fielded capabilities; and
- (4) Examples of programs currently transitioning or transitions planned for fiscal year 2016, including any supporting documentation, like transition agreements, AOAs, or cost estimation, which may be used for decisions to proceed beyond engineering and manufacturing development stage.

### *Technology supporting information operations and strategic communications*

The budget request contained \$33.5 million in PE 63699D8Z for emerging capabilities technology development, including for concept development of emerging irregular warfare technology needs, and demonstrations that have joint and interagency applicability.

The committee remains particularly concerned with the success of Islamic State of Iraq and the Levant (ISIL) messaging and propaganda, and ISIL's ability to persuade, inspire, and recruit from across the globe. ISIL's continued success on the battlefield depends on this messaging, and the group's propaganda attracts recruits and other support that enables the organization to persist. Consequently, the committee believes that the campaign to degrade and defeat ISIL on the battlefield must be mated with a comparable effort to degrade and defeat ISIL's message in the minds of potential supporters. The committee believes that there is a critical need for technologies and strategies to help counter ISIL's narrative and battlefield successes, and to enhance U.S., allied, and international partner information operations capabilities to mitigate and marginalize ISIL's ability to influence and inspire. Elsewhere in this report, the committee provides additional authority for a pilot program to support information operations and strategic communications capabilities. The committee urges the Department of Defense to work with the combatant commands to provide technological and operational capabilities to support the tactical, operational, and strategic requirements of the various combatant commanders.

The committee is aware that the Emerging Capabilities Technology Development (ECTD) program and its predecessors have been instrumental in assessing the technology needs of the strategic communication and information operations communities, and have pursued successful demonstration of some of those capabilities. For example, the Information Operations Assessment Foundation effort identified best practices in the Department, industry, and academia to help develop and refine processes and tools for information operations assessments, and transitioned to the Joint Information Operations Warfare Center. ECTD has also developed an influence assessment training capability project for use in both influence assessment and Theater Campaign Planning, as well as a Web-based counter-messaging prototype tool that was delivered to the interagency

Center for Strategic Counterterrorism Communications at the Department of State and is being considered for transition to other potential combatant command users.

Therefore, the committee recommends \$43.5 million, an increase of \$10.0 million, in PE 63699D8Z to support the development and demonstration of technologies supporting information operations and strategic communications. Of that, \$5.0 million should be applied to countering Russian Federation propaganda, and \$5.0 million should be applied to countering the propaganda of ISIL.

*U.S. Special Operations Command Terrain Following/Terrain Avoidance Radar program for MC-130J aircraft*

The budget request contained \$35.4 million for procurement of the MC-130 Terrain Following/Terrain Avoidance Radar program.

The committee notes that U.S. Special Operations Command (USSOCOM) recently conducted an analysis of alternatives for MC-130J Commando II aircraft, and that this analysis led to the decision to discontinue development of the APN-241 radar and to transition to the AN/APQ-187 Silent Knight Radar. The committee understands that during contractor flight tests of the APN-241 modified for terrain following, operators and testers deemed the APN-241 unsafe and ineffective for Terrain Following/Terrain Avoidance (TF/TA) flight, and that any modification to the current APN-241 would require extensive redesign and result in a new radar system. As such, the committee supports the USSOCOM Commander's decision to accelerate transition to the AN/APQ-187 Silent Knight Radar program, and based on the justification provided to the committee from USSOCOM, recommends transferring available funding from the MC-130 Terrain Following/Terrain Avoidance Radar procurement program to higher priority programs in other budget appropriations. The committee directs the Commander, U.S. Special Operations Command to provide a briefing to the House Committee on Armed Services by July 30, 2015, on the TF/TA radar program for MC-130J aircraft.

Further, the committee recommends no funding, a decrease of \$35.4 million, for procurement of the MC-130 Terrain Following/Terrain Avoidance Radar program. In lieu of these procurement funds, the committee recommends \$42.3 million, an increase of \$15.2 million, in PE 60403BB for continued development of the MC-130 Terrain Following/Terrain Avoidance Radar Program. In addition, the committee recommends \$23.2 million, an increase of \$5.0 million, in PE 1105219BB for Medium Altitude Long Endurance Tactical (MALET) MQ-9 Unmanned Aerial Vehicle development. Finally, the committee recommends \$26.9 million, an increase of \$15.2 million, for the continued procurement of the MALET MQ-9 Unmanned Aerial Vehicle.

OPERATIONAL TEST AND EVALUATION, DEFENSE

Overview

The budget request contained \$170.5 million for operational test and evaluation, Defense. The committee recommends \$170.5 million, full funding of the budget request.

The committee recommendations for the fiscal year 2016 operational test and evaluation, Defense program are identified in division D of this Act.

## LEGISLATIVE PROVISIONS

### SUBTITLE A—AUTHORIZATION OF APPROPRIATIONS

#### Section 201—Authorization of Appropriations

This section would authorize appropriations for research, development, test, and evaluation at the levels identified in section 4201 of division D of this Act.

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

#### Section 211—Extension of Defense Research and Development Rapid Innovation Program

This section would amend section 1073 of the Ike Skelton National Defense Authorization Act for Fiscal Year 2011 (Public Law 111–383) by extending the authorization for the Department of Defense to execute activities for the Rapid Innovation Program through 2020.

#### Section 212—Limitation on Availability of Funds for Medical Countermeasures Program

This section would limit the obligation and expenditure of 50 percent of the funds made available for the Department of Defense Medical Countermeasures program within the Chemical-Biological Defense Program until the Secretary of Defense provides a report to the congressional defense committees that validates the requirements and conducts an independent cost-benefit analysis to justify funding and efficiencies. This section would also require the Comptroller General of the United States to submit a review of the certification to the congressional defense committees within 60 days after the date on which the Secretary submits his report.

The committee is concerned that the Advanced Manufacturing and Development (ADM) program within the Medical Countermeasures Program has experienced a program delay of 16 months and an increase in cost of more than \$52.0 million. The committee expects the Department of Defense to conduct this review and assessment of the ADM program in order to determine the future of the program, and whether continuing it in a fiscally constrained environment is in the best interests of the Department of Defense and the U.S. Government.

## Section 213—Limitation on Availability of Funds for F-15 Infrared Search and Track Capability Development

This section would limit the obligation or expenditure of funds authorized to be appropriated by this Act or otherwise made available for fiscal year 2016 for research, development, test, and evaluation, Air Force, for F-15 infrared search and track capability to not more than 50 percent until a period of 30 days has elapsed following the date on which the Secretary of Defense submits a report to the congressional defense committees. This section would require the Secretary of Defense to submit such report not later than March 1, 2016, detailing the requirements and cost estimates for the development and procurement of infrared search and track capability for F/A-18 and F-15 aircraft of the Navy and the Air Force. The report would include: a comparison of the requirements between the F/A-18 and F-15 aircraft infrared search and track development efforts of the Navy and the Air Force; an explanation of any differences between the F/A-18 and F-15 infrared search and track capability development efforts of the Navy and the Air Force; a summary of the schedules and required funding to develop and field such a capability; an explanation of any need for the Navy and the Air Force to field different F/A-18 and F-15 aircraft search and track systems; and any other matters the Secretary determines appropriate.

## Section 214—Independent Assessment of F135 Engine Program

This section would require the Secretary of Defense to enter into a contract with a federally-funded research and development center to conduct an assessment of the F135 engine program and to submit a report containing such assessment by March 16, 2016. The assessment would include an assessment of the reliability, growth, and cost reduction efforts with respect to the F135 engine program, including a detailed description of the reliability and cost history of the engine, the identification of key reliability and cost challenges to the program as of the date of the assessment, and the identification of any potential options for addressing such challenges. Additionally, the assessment would include a thorough assessment of the F135 engine failure and subsequent fire on June 23, 2014, including the identification and definition of the root cause of the incident, the identification of potential actions or design changes needed to address such root cause, and the associated cost, schedule, and performance implications of such incident to both the F135 engine program and the F-35 Joint Strike Fighter Program. The federally-funded research and development center selected to carry out the assessment would do so by analyzing data collected by the F-35 Joint Program Office, other elements of the Federal Government or contractors, and the conduct of such assessment would not affect the Secretary's plans to dispose of the aircraft involved.

## SUBTITLE C—OTHER MATTERS

## Section 221—Expansion of Education Partnerships to Support Technology Transfer and Transition

This section would modify the authority for education partnerships in section 2194 of title 10, United States Code, by allowing institutions that support technology transition or transfer activities, such as business schools or law schools with technology management programs, to participate.

The committee is aware that the current statute authorizing educational partnership agreements (EPA) limits the educational institutions that can participate to “local educational agency, colleges, universities, and any other nonprofit institutions that are dedicated to improving science, mathematics, and engineering education.” Historically, law schools and business schools that might have technology-focused concentration areas have been deemed ineligible to participate. By permitting defense laboratories to form an EPA with a business school, it would allow the laboratories to work with students who can examine technology for its commercial potential, provide for early market assessments, and evaluate market strengths and weaknesses. Likewise, by allowing law schools to participate in an EPA, the laboratory could work with law students on patent assessments and legal issues involving technology transfer. The committee also believes that these kinds of arrangements would create opportunities for business students to enhance their skills related to commercializing technology using real-world inventions, helping to ensure a future workforce skilled in entrepreneurship and the creation of high-tech companies. Law students would gain experience related to intellectual property development and protection that would also be valuable in business development.

## Section 222—Strategies for Engagement with Historically Black Colleges and Universities and Minority-Serving Institutions of Higher Education

This section would require the Secretaries of the military departments to each develop a strategy for engagement with and support of the development of scientific, technical, engineering, and mathematics capabilities with historically black colleges and universities and minority-serving institutions, and to submit such strategies to the congressional defense committees within 180 days after the date of the enactment of this Act. This section would also require the Secretary of Defense to develop a strategy that encompasses the strategies developed by the military departments and to submit this strategy to the congressional defense committees not later than 1 year after the date of the enactment of this Act.

## Section 223—Plan for Advanced Weapons Technology War Games

This section would require the Secretary of Defense, in coordination with the Chairman of the Joint Chiefs of Staff, to develop a plan for integrating advanced technologies, such as directed energy weapons, hypersonic strike systems, and autonomous systems, into broader title 10 war games to improve socialization with

the warfighter and the development and experimentation of various concepts for employment by the Armed Forces. The Secretary would be required to submit the plan to the congressional defense committees not later than 180 days the date of the enactment of this Act.

The committee believes that there are a number of emerging advanced weapons systems, like directed energy, electromagnetic railguns, hypersonics, and autonomous systems, that have the potential for dramatically enhancing the military effectiveness of U.S. forces. The committee has been concerned in the past with the transition of some of these science and technology concepts into fielded systems, and recognizes that there are a number of factors that can inhibit this transition. The committee believes that a significant factor is the lack of experimentation, concept development and war gaming that can be helpful in ironing out the technology, refining operating concepts and gaining warfighter trust and confidence in untested systems. The committee is aware of numerous historical examples in which experimentation with new technologies in peacetime have paved the way for their adoption and effective use in wartime. The committee believes that increasing integration of these new, advanced technology weapons systems into existing exercises, either as tangible prototypes or as conceptual excursions, could be valuable in promoting the experimentation needed to lay the foundation for successful technology adoption by the warfighting community.

#### Section 224—Comptroller General Review of Autonomic Logistics Information System for F-35 Lightning II Aircraft

This section would require the Comptroller General of the United States to conduct an analysis of the autonomic logistics information system (ALIS) element of the F-35 program, and to submit a report to the congressional defense committees by April 1, 2016 on the analysis. The committee intends this review to address issues of performance, cost, and suitability with ALIS software that will inform committee action on the F-35 program in the future. The committee supports the F-35 Lightning II aircraft program as a critical component required to maintain future air superiority and global strike capability. The committee also notes that the F-35 Joint Program Office and the prime contractor have taken steps to address maintainability and reliability issues with the F-35 that have the potential to significantly improve performance in those areas.

However, the committee is concerned that continued problems with the performance of the ALIS element of the F-35 program may put the program at significant risk of cost increases and performance shortfalls. The committee notes that section 218 of the National Defense Authorization Act for Fiscal Year 2014 (Public Law 113-66) required the Department of Defense to conduct an independent detailed review of F-35 software, including the ALIS system, and that the subsequent report highlighted the potential risks that challenges with the ALIS program could create. The committee further notes that as part of oversight visits to facilities where F-35 is being operated, the committee received numerous

complaints and concerns by F-35 maintenance and operational personnel regarding the limitations, poor performance, poor design, and overall unsuitability of the ALIS software in its current form. Finally, in testimony provided by Department of Defense officials at a hearing before the Subcommittee on Tactical Air and Land Forces on April 14, 2015, that Government witnesses confirmed the same problems observed by members at field locations.

### Section 225—Briefing on Shallow Water Combat Submersible Program

This section would require a briefing to the congressional defense committees on the U.S. Special Operations Command Shallow Water Combat Submersible prior to program acceptance of the first article delivery on the account of schedule delays and a reduction of final basis of issue from 14 to 10 platforms.