

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

### OVERVIEW

The budget request contained \$69.4 billion for research, development, test, and evaluation.

The committee recommends \$70.4 billion, an increase of \$979.5 million to the budget request.

The committee recommendations for the fiscal year 2013 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 \$8.9 billion for research, development, test, and evaluation, Army. The committee recommends \$8.5 billion, a decrease of \$472.1 million to the budget request.

The committee recommendations for the fiscal year 2013 research, development, test, and evaluation, Army program are identified in division D of this Act.

##### Items of Special Interest

###### *Acute Lung Injury Medical Research*

The committee is aware that acute lung injury and acute respiratory distress are significant and growing challenges for combat casualty care caused in large part by the increasing survival rate of combatants surviving the initial blasts from improvised explosive devices. Existing technology such as mechanical ventilators and extracorporeal membrane oxygenation are too complicated for battlefield use. The committee is aware that an artificial lung replacement technology, known as an extracorporeal lung support has been demonstrated as an effective, less expensive, and safer alternative. The committee encourages the Department of Defense to explore the possibility of developing alternative lung support devices rugged, portable, and minimally invasive enough for use in a battlefield environment.

###### *Armored Multi-Purpose Vehicle*

The budget request contained \$74.1 million in PE 23735A for the Combat Vehicle Improvement Program to continue the Armored Multi-Purpose Vehicle (AMPV) program.

The House of Representatives continues to support the AMPV program and notes that in the conference report (H. Rept. 112–329) accompanying the National Defense Authorization Act for Fiscal Year 2012, the conferees provided numerous options for consideration by the Army to accelerate the program. The committee is disappointed that the Army has elected not to accelerate the program.

The committee understands that the budget request would slip low-rate initial procurement of the AMPV by an additional year to fiscal year 2017. The committee believes that the acceleration of the AMPV program, which would use tracked and/or wheeled variants of systems already fielded, is not a high-risk endeavor and

could also serve to partially mitigate the proposed 3-year break in production of the combat vehicle production base. In addition, the committee is aware that existing manufacturers in the combat vehicle production base have already produced working prototypes of the AMPV. Furthermore, the committee recognizes that the AMPV has many of the attributes of the successful “Interim Armored Vehicle” competitive acquisition, which was fielded 2 years after it was first announced by the Chief of Staff of the Army. The committee encourages the Army to consider modifying its current acquisition strategy and explore the feasibility of beginning low-rate initial procurement of the AMPV in calendar year 2015.

The committee recommends \$74.1 million, the full amount requested, in PE 23735A for the AMPV program.

#### *Autonomous Sustainment Cargo Container*

The committee recognizes the importance of safely moving containerized supplies from ship-to-shore during contingency operations. The committee has encouraged the development of new robotic concepts for this logistics operation and, in previous years, has supported investments in field-test data for an Autonomous Sustainment Cargo Container (ASCC).

The committee understands, however, that the Army has stated that it does not have a capability gap in its ability to move containerized cargo from ship to shore that the ASCC would address. Therefore, the committee directs the Secretary of the Army to further assess incorporating the ASCC into the Army’s current and near-future logistics operations at the off-shore distances in accordance with Army doctrine (including future sea basing). At a minimum, this analysis should review:

- (1) The military utility of using an autonomous cargo container across a range of military operations and in various environments including adverse weather/terrain, hostile asymmetrical warfare, and Humanitarian Assistance/Disaster Relief operations;

- (2) How ASCC’s capabilities would be incorporated into the Army’s logistics operations, from point of supply through delivery to point of need;

- (3) The cost estimates to procure, operate, and sustain ASCC in comparison to the lifecycle costs of current manned capabilities; and

- (4) If applicable, additional operational and logistics impacts to the Army of incorporating ASCC into its processes.

Additionally, the committee directs the Secretary of the Army to submit a report on the Army’s findings to the congressional defense committees within 180 days after the date of the enactment of this Act.

#### *Body Armor Enhancements and Personnel Protection Equipment for Female Soldiers*

The budget request contained \$32.0 million in PE 63827A for soldier systems-advanced development. Of this amount, \$15.0 million was requested for the development of improved soldier personnel protective equipment efforts. The budget request also contained \$96.4 million in PE 64601A for infantry support weapons. Of this

amount, \$11.9 million was requested for the development and testing of prototypes for improved personnel protective equipment.

Section 216 of the National Defense Authorization Act for Fiscal Year 2010 (Public Law 111–84) required the Secretary of Defense to establish separate research and development program elements for body armor. The committee notes that while science and technology (S&T) funds and projects for body armor activities have been reasonably robust, there has been no significant advanced component development, prototype development, and system development and demonstration (RDT&E) budget activities from which successful S&T projects could be transitioned. The committee is encouraged by the budget request for fiscal year 2013. The committee expects these RDT&E programs to include: female body armor to ensure the warfighter is equipped with the most current individual protection gear; develop ways to reduce weight with current technologies; and increased investment in promising technologies that would eventually achieve reduced weight and increased protection together, as well as maximize flexibility and modularity. The committee also notes that the tradeoff between protection capabilities and weight is a major cost driver in body armor procurements and that this has become a major source of contention related to the measures of protection body armor must provide. The committee further notes available technology has not been able to keep the system within the user's desired weight without sacrificing performance. The committee expects the Secretary of the Army to adequately resource these RDT&E efforts in order to improve performance and reduce the weight of systems.

The committee is also aware of concerns expressed by female members of the Armed Forces deployed in support of Operation New Dawn (OND) and Operation Enduring Freedom (OEF) that the current interceptor body armor system's design may not be as ergonomically effective for female soldiers. The committee notes that the current counter-insurgency and dismounted operations in support of OND and OEF place female service members in direct combat action with the enemy. The committee understands the U.S. Army is currently pursuing several S&T and RDT&E programs to improve upon organizational clothing and individual equipment (OCIE) for soldiers to include programs specifically focused on female soldiers. The committee commends the Army for recognizing this issue and encourages the acceleration of these efforts to help determine the most effective OCIE to include body armor and associated components, for military service members. The committee also encourages the Army to continue to improve upon the partnerships and coordination of efforts between the S&T and acquisition OCIE communities in order to help streamline the transition of technologies into a readily available solution that could be used in the field by the warfighter.

The committee directs the Secretary of the Army to conduct an assessment as to whether there is an operational need to tailor the interceptor body armor systems fielded to female service members specifically for the physical requirements of women. This assessment should include a comprehensive market survey of commercial body armor system designs specifically tailored for female body types. The committee further directs the Secretary of the Army to provide a briefing to the congressional defense committees within

180 days after the date of the enactment of this Act on the results of the assessment, as well as to provide an update on all other currently funded programs addressing personnel protection equipment for female soldiers.

The committee recommends \$32.0 million, the full amount requested, in PE 63827A for soldier systems-advanced development, and \$96.4 million, the full amount requested, in PE 64601A for infantry weapons program project for development and testing of prototypes for improved personnel protective equipment.

#### *Cellular Networking to the Tactical Edge*

The committee recognizes the Department of Defense has successfully deployed a secure third-generation (3G) cellular network in the Islamic Republic of Afghanistan to provide commanders with enhanced situational awareness and intelligence capabilities as part of its Last Tactical Mile program. By enabling seamless real-time communication between troops in the field and in-theater, this capability has increased operational effectiveness by generating actionable intelligence while enhancing unit mobility.

The committee commends the Army for its effort to deploy a mobile, secure cellular network to facilitate collection of multi-modal biometrics and identity information. Further, the committee encourages the Department of Defense to incorporate the lessons learned from the Last Tactical Mile program and consider wider application of these capabilities as it continues to improve the quality and security of its communications systems.

#### *Efforts to Improve the Sustainment of Body Armor*

The committee notes that the domestic body armor industrial base has expanded significantly since 2003 after procurement objectives were increased significantly to outfit all U.S. Armed Forces and Department of Defense (DOD) civilian personnel in the U.S. Central Command's area of responsibility. The committee notes that the total body armor program evolved from a \$40.0 million program in 1999, to over \$6.0 billion through 2012. This represents a significant investment by the military services for individual personnel protection, and the committee recognizes the importance of this program.

Current overseas contingency operations have demonstrated that body armor has become a critical item on the battlefield. Therefore, maintaining a reliable and cost-effective body armor industrial capability sufficient to meet strategic objectives should continue to be an important consideration when developing current and future acquisition strategies for all body armor components. Currently, the industrial base is approaching an inflection point due to uncertainty of future demand and associated procurement of body armor. The rate of procurements has dramatically slowed. The committee notes that industry has been willing to absorb the cost of non-utilized and underutilized manufacturing capacity in the hope that DOD contracts will continue; however, this cannot be sustained indefinitely. The potential dynamic nature of current and future threats has increased the challenge to forecast requirements and inform industry in advance.

The committee notes that the military services are resourcing ongoing projects and initiatives to understand and improve the life-

span of soft body armor components. The committee understands that current efforts are examining environmental effects, ballistic fiber accelerated aging, and fiber/fabric surface treatment during the weaving process. The committee notes that there is also research into three-dimensional weaving technology, and that modeling and simulation on soft armor architecture is also being investigated for more durable materials. The committee supports these initiatives.

In addition, the committee directs the Secretary of the Army to provide a briefing to the congressional defense committees within 180 days after the date of the enactment of this Act that provides an assessment of the long-term sustainment requirements for the body armor industrial base in the United States, to include supply chains for hard and soft body armor. The briefing should also include an assessment of body armor and related research, development, and acquisition objectives, priorities, and funding profiles for hard and soft body armor components in the following areas: (1) advances in the level of protection; (2) weight reduction; (3) manufacturing productivity and capability; and (4) efforts and new technologies that could currently be used to extend the lifespan of hard and soft body armor components.

#### *Ground Robotic Vehicle Development*

The committee is aware that the first generation of robotic ground vehicles helped to counter the threat of improvised explosive devices to both mounted and dismounted forces in support of Operation Enduring Freedom and Operation Iraqi Freedom. The committee notes that a key performance requirement for the next generation of robotic ground vehicles is the transportation of infantry equipment and supplies, and to provide the warfighter with increased situational awareness capability. Ground vehicle robots also have the potential to improve the speed and accuracy with which supplies are delivered to warfighters operating in a combat zone. The committee notes that multiple ground robotic development efforts are currently funded by the military services and other Department of Defense agencies and organizations. The committee notes that many of these efforts could potentially overlap and currently appear to lack coordination. Therefore, the committee encourages the Department to maintain a coordinated effort in advancing ground robotic research, development, and acquisition in order to improve cost, schedule, and performance of current and future initiatives.

#### *Joint Air-to-Ground Missile Program*

The budget request included \$10.0 million in PE 65450A for Joint Air-to-Ground Missile (JAGM) research and development.

The committee supports the JAGM program and approves of the decision to continue the program as outlined in the revised Acquisition Decision Memorandum (ADM) issued by the Under Secretary of Defense for Acquisition, Technology, and Logistics on March 20, 2012. The committee notes that significant prior-year funding is available to continue the program and encourages expedited contracting actions to ensure that these funds can be obligated in fiscal year 2012. While the committee agrees with the decision in the ADM to explore technical trades to achieve a more affordable solu-

tion, the committee recommends that the Army retain a requirement for an all-weather, moving target-capable missile, with an emphasis on missile solutions capable of being fielded within 3 years of contract award. Therefore, the committee directs the Secretary of the Army to provide a briefing to the congressional defense committees by August 1, 2012, on the revised acquisition plan, anticipated requirements, and program schedule and funding needs.

The committee recommends \$10.0 million, the full amount requested, in PE 65450A for JAGM research and development.

#### *M4 Carbine Product Improvement Program*

The budget request contained \$96.5 million in PE 64601A for Infantry Support Weapons. Of this amount, \$9.6 million was requested for the Individual Carbine competition and \$9.2 million was requested for the M4 carbine product improvement program (PIP).

The committee notes that U.S. Army officials have informed the committee that the Army would resource a three-phase acquisition strategy to review potential upgrades to the M4 carbine. Section 212 of the National Defense Authorization Act for Fiscal Year 2012 (Public Law 112–81) required the Secretary of the Army to submit to the congressional defense committees a business case assessment of commercially available upgrade kits and weapon systems before allowing the next generation Individual Carbine to enter full-rate production. The committee is concerned that the budget request does not contain the necessary resources to conduct the evaluation of commercial-off-the-shelf upgrade kits despite the Army's stated intent to do so in phase III of the PIP acquisition strategy.

Therefore, the committee directs the Secretary of the Army to submit a report to the congressional defense committees within 180 days after the date of enactment of this Act that outlines the Army's plan to evaluate commercial-off-the-shelf upgrade kits to the M4 carbine in the product improvement program. This report should include the business case assessment comparing the capabilities and costs of commercial-off-the-shelf upgrade kits to the enhanced M4/A1 carbine.

The committee recommends \$9.6 million, the full amount requested, in PE 64601A for the Individual Carbine competition, and \$9.2 million, the full amount requested, for the M4 PIP program.

#### *Occupant-Centric Survivability Technology Development Program*

The committee understands that the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) has established the occupant centric survivability program, with a goal of examining technologies that can significantly protect vehicle occupant casualties. The committee supports this effort. The committee understands that as part of its effort to improve occupant survivability, TARDEC is reviewing industry-derived integrated solutions, such as rapid occupant evacuation systems, modular composite armor and rocket-propelled grenade mitigation, exterior underbody and interior floor improvised explosive device blast mitigation solutions, roof-mounted blast seating and restraint systems, and thermal injury prevention to include fuel containment systems.

The committee notes that the Marine Corps used a similar and innovative “kit” approach that tightly integrated numerous survivability technologies in an effort to significantly upgrade the occupant protection of Marine Corps’ Light Armored Vehicles. The committee understands that such an integrated occupant-centric survivability system is potentially applicable to a wide-range of existing and future Army and Marine Corps vehicles and could be installed on current platforms in the near-term during depot reset, or in theater.

Therefore, the committee directs the Director, U.S. Army Tank Automotive Research, Development and Engineering Center to provide a report to the congressional defense committees by January 1, 2013, on the status of evaluating candidate occupant-centric survivability systems to include: prototyping and testing activities; the potential for integrating candidate technologies on existing vehicles, such as the Stryker vehicle, the Bradley Fighting Vehicle, the Armored Multi-Purpose Vehicle, and the high mobility, multi-purpose wheeled vehicle; and the status of coordinating findings with the Marine Corps.

#### *Patriot Product Improvement Program*

The budget request contained \$110.0 million in PE 67865A for the Patriot Product Improvement Program.

The committee is concerned that the Army has not yet presented to Congress a prioritized plan to support the long term requirements of a modification program for a system that will be operational through at least 2035. Therefore, the committee directs the Secretary of the Army to submit a report not later than October 31, 2012, that provides a prioritized modernization plan for the Patriot system which addresses replacement of obsolete components and subsystems, development and insertion of technologies that can address evolving threats, including those technologies developed through the Medium Extended Altitude Defense System (MEADS), and introduction of life-cycle costs reduction changes.

The committee notes that a plan to harvest technology from MEADS was a specific requirement of the report mandated in section 235 of the National Defense Authorization Act for Fiscal Year 2012 (Public Law 112–81), which has not yet been fulfilled. The committee believes such plan should be included in the fiscal year 2014 budget request and beyond.

The committee recommends \$110.0 million, the amount requested, in PE 67865A for the Patriot Product Improvement Program.

#### *Pilot Aid for Helicopter Landing and Cargo Handling*

The committee is aware of the Army’s need to improve mission safety for helicopter air and ground crews involved in landing and cargo handling, particularly in limited visibility conditions. The Army Aviation and Missile Research, Development, and Engineering Center has already demonstrated this capability. In addition, the Navy and Marine Corps have deployed, on unmanned helicopter systems, technology to autonomously deliver cargo on unmanned rotorcraft that could be adapted for use as a cognitive decision aid, freeing pilots to concentrate on flight safety. The committee recommends that the Army evaluate the potential contribu-

tion of autonomous cargo delivery technology as a cognitive pilot aid on its manned rotorcraft, for landing and cargo handling.

*Research, Development, and Engineering Command*

The committee is aware that the Department of the Army is assessing the role of the Research, Development, and Engineering Command (RDECOM) in an ongoing Material Development and Sustainment study. In the committee report (H. Rept. 112–78) accompanying the National Defense Authorization Act for Fiscal Year 2012, the committee also requested a study by the Army to examine the potential impact of disestablishing RDECOM. The committee strongly supports the RDECOM mission to prevent unnecessary duplication of research and development, while ensuring integration and coordination of various efforts. The committee believes that the level of oversight and discipline that RDECOM brings to the Army acquisition enterprise is vital to the effective stewardship of the taxpayer's investment, and necessary to implement a systematized engineering approach as required by the Weapon Systems and Acquisition Reform Act of 2009 (Public Law 111–23). Therefore, the committee urges the Army to refrain from any effort to disestablish, relocate, or devolve any RDECOM functions, including the reassignment of personnel, until these studies have been completed and thoroughly reviewed by the committee.

*Robotics for Surgical Procedures*

The committee notes that emerging robotics applications have the potential to improve minimally invasive surgery techniques. The committee supports continued research by the Army's Telemedicine and Advanced Technology Research Center (TATRC) into surgical robotics technologies that could lead to greater remote-surgery capability and surgical capability in non-sterile environments. The committee further believes that such robotics applications for forward-deployed and combat situations, like those used in transluminal endoscopic oral surgery, reduce the risk of life-threatening internal infection associated with accidental injury during surgical procedures.

*Rotary-Wing Performance Surface*

The committee recognizes the need for the development of a rotary wing performance mission planning tool that improves aviation safety and survivability. Such a system could provide mission planners and air crews with the capability to display specific airframe performance characteristics that take into account terrain and soil features, and other performance factors to provide qualitative assessments of flight routes and landing zones. Such a system could also provide mission planners and aircrews with the capability to rapidly assess an area-of-operation for a forecasted time. This type of capability should be interoperable with existing aviation mission planning decision making tools and have the potential to be integrated with technologies facilitating operations in degraded visual environments.

The committee directs the Secretary of the Army to submit a report to the congressional defense committees by February 28, 2013, assessing the current capabilities and capability gaps in Army Aviation mission planning tools that would provide aircrews with

enroute and landing zone assessments. The report should also take into consideration available empirical data derived from aircraft performance attributes, weather and environmental conditions, and known terrain conditions.

#### *Shadow Unmanned Aerial System Alternative Engine*

The committee notes that the Army's Shadow unmanned aerial system (UAS) has accumulated over 1 million flight hours in support of Operation Enduring Freedom and Operation Iraqi Freedom. The committee understands that a planned upgrade of the Shadow may enable it to perform longer-range and higher-altitude missions. The committee also notes that the Shadow's current engine runs on high-octane gasoline, which creates a significant logistics burden for the Army. The committee is also aware that the Army is pursuing an alternative engine to enhance UAS performance. The committee encourages the Army to continue development of alternative engine solutions and encourages the Army to consider high-efficiency, air-breathing turbine engine technologies. The committee directs the Secretary of the Army to provide a report to the congressional defense committees within 90 days after the date of the enactment of this Act that details the Army's plans to modernize the Shadow platform's propulsion system.

#### *Smartphone Application Development for the Battlefield*

The budget request contained \$50.7 million in PE 63008A for electronic warfare advanced technology.

The committee notes that this program matures technologies that address the seamless integrated tactical communications challenge with distributed, secure, mobile, wireless, and self-organizing communications networks that will operate reliably in diverse and complex terrains, in all environments. Within this program element, the committee urges the Army to also focus research and development efforts on smartphone applications that support battle command planning and information interoperability, including those used with coalition partners.

The committee recommends \$50.7 million, the full amount requested, in PE 63008A for electronic warfare advanced technology.

#### *Turbo Fuel Cell Advanced Technology Development*

The budget request contained \$69.0 million in PE 62601A for combat vehicle and automotive technology. Of this amount, \$24.4 million was requested for ground vehicle technology.

The committee believes the integration of mature, advanced fuel cell technologies into an engine that could effectively meet military logistic requirements should be adequately resourced. The committee is encouraged by the work being done at the Army's Research, Development and Engineering Command-Tank Automotive Research, Development and Engineering Center (RDECOM-TARDEC), where engineers are developing a turbo fuel cell engine for the Heavy Expanded Mobility Tactical Truck, which is the primary logistics vehicle being used in support of Operation New Dawn and Operation Enduring Freedom. The committee notes that funding at RDECOM-TARDEC has been used to manufacture tubular air electrodes for stable, high-performance solid oxide fuel cells. The committee encourages RDECOM-TARDEC to continue

its work in the development of the turbo fuel cell engine and supports its efforts to increase energy efficiency utilizing renewable and alternative sources of energy.

The committee recommends \$69.0 million, the full amount requested, in PE 62601A for combat vehicle and automotive technology.

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

##### Overview

The budget request contained \$16.9 billion for research, development, test, and evaluation, Navy. The committee recommends \$17.7 billion, an increase of \$835.5 million to the budget request.

The committee recommendations for the fiscal year 2013 research, development, test, and evaluation, Navy are identified in division D of this Act.

##### Items of Special Interest

###### *Defense University Research Instrumentation Program*

The budget request contained \$113.7 million in PE 61103N for University Research Initiatives. Of that amount, \$19.4 million was requested for the Defense University Research Instrumentation Program (DURIP).

The committee notes that DURIP grants are awarded exclusively on Department of Defense (DOD)-relevant projects that have undergone a rigorous and competitive application process administered by the Office of Naval Research. This process identifies the winning proposals as fulfilling vital and immediate research needs for which investments in instrumentation and infrastructure are critical.

As the Navy protects its investment in basic research, it is vital to ensure that researchers have access to state-of-the-art research instrumentation to carry out transformative oceanographic research in support of Navy programs.

The committee recommends, \$123.7 million, an increase of \$10.0 million, in PE 61103N for the DURIP.

###### *Development of Unmanned Systems Weapon, Sensor, and Payload Integration and Interoperability Capabilities*

The committee recognizes that providing unmanned aircraft systems (UAS) to the warfighters has been a high priority requirement for each of the military services. However, quick reaction programs for the purpose of fielding UAS on an expedited basis has frequently resulted in acquisition of UAS with proprietary software and subsystems, unique to specific UAS, making it costly to update UAS capabilities.

The Office of the Secretary of Defense and the Department of the Navy are on record citing the importance of the integration and interoperability of UAS sensors and ordnance. The Department of the Navy is therefore encouraged to select an organization within the Department of the Navy best-suited to conduct a review of its UAS to determine appropriate courses of action; including consolidation of integration and interoperability efforts and an investment strategy to achieve further integration and interoperability of UAS

sensors and various types of ordnance. Further, recommendations for consolidation of the integration and interoperability efforts should give site priority to existing scientific research, development, test, and evaluation centers of excellence with experience working with the other military services and with personnel whose intellectual capital and background expertise is hardware-in-the-loop and system-integration of weapons, sensors, and payload systems onto various types of manned and unmanned aircraft systems. Finally, consolidation sites considered should have real-time modeling and simulation weapons laboratories and instrumented weapons-open-air ranges, within military restricted airspace.

The committee recommends that this review be coordinated with the appropriate Department of the Navy weapon system development centers, with participation of personnel from UAS operational units and industry providers of current and planned UAS sensors and ordnance. The committee also recommends that the Department of the Navy provide a briefing on the results of its review to the congressional defense committees, the Senate Select Committee on Intelligence, and the House Permanent Select Committee on Intelligence, within 180 days after the date of enactment of this Act.

#### *Electromagnetic Railgun*

The budget request included \$89.2 million in PE 62114N for power projection applied research, including funds for the Navy's electromagnetic railgun (EMRG) Innovative Naval Prototype (INP).

The committee is aware that the Navy EMRG program has the potential to provide significant benefits over conventional guns by utilizing electricity to create launch projectiles at speeds more than twice of that achievable by conventional guns. In addition, the elimination of the chemical propellant could allow for much deeper magazines due to a smaller round and provides warfighter safety and logistic benefits through the elimination of a large fraction of the energetic material from the magazine. The committee believes that such advances will provide naval vessels with increased strike capability and longer time on-station, as well as provide necessary capabilities to operate effectively in anti-access, area denial environments. The committee is also aware that the electromagnetic railgun has the potential to be useful in a land-based defense mode against missile threats. For both land and sea based options, the committee believes that the Navy should work toward rapidly deploying this technology as soon as practicable.

The committee recommends \$89.2 million, the full amount requested, in PE 62114N for power projection applied research.

#### *Marine Corps Early Transition Activities*

The committee is aware that the replacement program for Navy's current enterprise intranet, the Next Generation Enterprise Network (NGEN), is expected to be one of the most complex information technology (IT) systems in the Department of Defense. NGEN is expected to supply a secure IT infrastructure for the continental United States and select locations overseas, providing the foundation for a future Naval Networking Environment. The committee recognizes that such a complex system poses management and acquisition challenges unlike those seen by other defense IT systems. Despite these challenges, the committee is aware that the Marine

Corps has made exceptional strides in executing early transition activities to better position the Marine Corps to move to NGEN. The committee applauds the Marine Corps for quickly and efficiently implementing changes to move from contractor-owned-and-controlled to Marine-owned-and-operated infrastructure, and to help implement lessons on behalf of the entire Department of the Navy.

#### *Naval Use of Non-Lethal Systems*

The committee is aware that the Navy has explored the use of non-lethal systems to protect naval vessels, such as using laser dazzlers or high-frequency acoustic hailing devices. The committee has approved previous requests by the Navy to reprogram funds to support urgent operational needs for non-lethal systems. The committee also notes that the President's budget requested \$177.1 million for Navy physical security equipment procurement, which includes acoustic hailing devices and laser dazzlers. The committee is concerned, though, that satisfying specific needs through urgent operational needs and reprogramming of funds does not indicate a systematic or Navy-wide view of the needs or requirements for non-lethal systems.

Therefore, the committee directs the Secretary of the Navy to submit a report to the congressional defense committees within 90 days after the date of the enactment of this Act on the total requirement for non-lethal systems for naval vessels, as well as a plan to meet this requirement.

#### *Navy Directed Energy Programs*

The budget request included \$89.2 million in PE 62114N for power projection applied research, including funds for the Navy's free electron laser (FEL) Innovative Naval Prototype (INP).

The committee is aware that the Navy is pursuing applied research and development of technologies supporting advanced accelerators with applications to directed energy weapons. This activity also includes the FEL INP, which, if successful, could be utilized for shipboard applications as a defensive weapon against advanced cruise missiles and asymmetric threats. The committee believes that such advances are necessary for the Navy to operate effectively in anti-access, area denial environments.

The committee recommends \$89.2 million, the full amount requested, in PE 62114N for power projection applied research.

#### *Shipbuilding Material Comparison*

In a recent article published in "Inside the Navy", it was reported that, "superstructure cracking in several classes of surface combatants is being addressed, but in some cases is proving costly". The committee is aware that three materials have been used in the deckhouses of surface combatants: steel, aluminum, and most recently for the deckhouse of the DDG-1000 Zumwalt class, composite material.

The committee is also aware that there is a cost differential in both up-front procurement and production and in lifecycle maintenance cost for these materials. The next opportunity that the Navy will have to influence a design will be with Flight III of the DDG-51 Arleigh-Burke destroyers. The committee directs the Secretary

of the Navy to provide a report to the congressional defense committees with delivery of the fiscal year 2014 budget request, comparing the estimated construction costs for a deckhouse made of each of the three materials, or even a possible hybrid of two or all three, and then compares the estimated lifecycle costs for the designed life of the ship.

#### *Surface Combatant Combat System Engineering*

The committee continues to support the Navy's continued pursuit of open architecture in its shipboard combat and communications architecture. The committee is also aware that the Navy has tested alternative network systems that reduce size, weight, and power requirements over legacy configurations with the potential to be more affordable as well. The committee encourages the Navy to continue to pursue these types of solutions.

#### *Universal Tactical Controller for Unmanned Systems*

The committee is concerned by the large number of proprietary controllers that have been fielded as part of small unmanned systems, including unmanned aerial vehicles (UAV), unattended ground sensors (UGS), and unmanned ground vehicles (UGV). The committee understands the roles of UAVs, UGVs, and UGSs have increased significantly since 2002. The committee notes that the current inventory of unmanned systems, from Class 1 UAVs to UGVs and UGSs, includes many different types of systems, each requiring a proprietary controller unique to those systems. The committee also notes that more than 19,000 systems have been fielded to units across the Department of Defense.

Therefore, the committee directs the Secretary of the Army, in coordination with the Secretary of the Navy, to determine the advisability and feasibility of developing a soldier-wearable, universal controller for the Army and the Marine Corps that could potentially operate Class 1 UAVs, UGSs, and UGVs, and to provide a briefing to the congressional defense committees within 180 days after the date of the enactment of this Act on the results of the study.

#### *Unmanned Aircraft Programs for Navy Aircraft Carriers*

The budget request contained \$142.3 million in PE 64402N for the Unmanned Combat Air System (UCAS) and \$122.5 million in PE 64404N for the Unmanned Carrier-Launched Airborne Surveillance and Strike (UCLASS) system.

The committee notes that the limited fielding operational capability date for the UCLASS has been delayed by two years in the fiscal year 2013 budget, but that the milestone activities associated with technology development for UCLASS and the high-level of concurrency with the UCAS program remain essentially the same. Furthermore, the reporting and certification requirements contained in section 213 of the National Defense Authorization Act for Fiscal Year 2012 (Public Law 112-81) have not been provided to the congressional defense committees regarding the UCLASS program. The Secretary of the Navy also plans to limit competition early in the UCLASS program by down-selecting to one contractor during the phase of preliminary design review. Additionally, the committee understands that more risk-reduction activities that

would benefit the technology development phase of the UCLASS program are possible within the UCAS program, but that the UCAS program is fiscally under-resourced to perform such activities.

The committee therefore recommends the transfer of \$75.0 million from PE 64404N for UCLASS to PE 64402N for UCAS risk-reduction activities. Elsewhere in this title, the committee includes a provision that would assist enhancing competition in the UCLASS program, but limit obligation of fiscal year 2013 UCLASS funds to 25 percent of the total appropriated until the requirements of section 213 of the National Defense Authorization Act for Fiscal Year 2012 (Public Law 112–81) are provided to the congressional defense committees.

#### *Unmanned Cargo-Carrying-Capable Unmanned Aerial System*

The committee notes that the Marine Corps is conducting an evaluation of a rotorcraft unmanned aerial system (UAS) that is being used to carry up to 4,500 pounds of cargo to remote sites in the Islamic Republic of Afghanistan. To date, the Marine Corps has indicated that the vehicle has flown approximately 250 hours over 192 flights, and carried nearly 600,000 pounds of cargo, with an operationally ready rate of 94 percent. The Marine Corps' use of the cargo-carrying-capable unmanned aerial vehicle has avoided having to resupply remote operating locations by the use of manned vehicle convoys, at significantly reduced cost as compared to manned rotorcraft or manned cargo aircraft; and also avoided exposing manned rotorcraft and cargo aircraft to enemy ground fire. The evaluation was originally planned to span 6 months, however, the Marine Corps plans to extend it another 6 months, through September 2012.

The committee supports the technical demonstration and evaluation of unmanned cargo-carrying-capable UAS. However, if the military services determine that they require cargo-carrying-capable UAS in their respective force structure, the committee believes the services should avoid duplication of their efforts, and encourages them to conduct common development where possible and maintain competition in development and procurement. The committee further notes that section 142 of the National Defense Authorization Act for Fiscal Year 2010 (Public Law 111–84) prohibits the obligation or expenditure of procurement funding for this capability until 15 days after the Department has certified that the Joint Requirements Oversight Council has approved a joint and common requirement for such a vehicle.

#### *Utilization of Navy Airship for Airborne Test and Evaluation*

The committee is aware that the Navy possesses a manned, lighter-than-air vehicle, designated the MZ–3A, that has been utilized by several agencies in recent years for airborne testing of sensors, communications equipment, and other electronic devices. The committee believes that lighter-than-air systems like the MZ–3A have the potential to provide low-cost, persistent airborne platforms for sensor testing.

The committee is concerned that the Navy has not fully exploited the benefits and availability of the MZ–3A versus other Navy platforms performing airborne sensor testing and evaluation programs

and may be utilizing higher-cost platforms instead. The committee believes that the Navy should maintain a full accounting of its test platforms to ensure that it maximizes its test and evaluation resources.

Therefore, the committee directs the Secretary of the Navy, in coordination with the Director of the Test Resource Management Center of the Department of Defense, to conduct an analysis of the usage of the MZ-3A for test and evaluation purposes and submit a report on the results of the analysis to the House Committee on Armed Services within 90 days after the date of the enactment of this Act. The analysis should examine the following:

- (1) An analysis of all of the test platforms used in the past two fiscal years, or planned for use in the upcoming two fiscal years;
- (2) Costs for maintaining these platforms, and any limitations requiring the use of specific platforms (such as availability or payload constraints); and
- (3) Description of the process for managing the selection of platforms for system testing and evaluation.

#### *Unmanned Undersea Vehicles*

The committee encourages the Department of Defense to intensify its efforts to integrate Unmanned Undersea Vehicles (UUVs) more fully into operations where viable and cost effective. The committee recognizes the tremendous advances made by the Navy in development of UUVs, but believes that increased emphasis on UUV programs of record will produce additional capabilities. As Navy standards and requirements solidify, external stakeholders will be incentivized to design and produce more advanced systems reflecting the latest in technology.

The committee is in agreement with the views of the Chief of Naval Operations that unmanned vehicles, particularly UUVs, can complement and augment manned naval systems; increasing their capability while reducing both risk to Navy personnel and cost. As an example, the ability of unmanned vehicles to provide persistent presence could enhance the effectiveness of surveillance missions in priority locations. The ability of one operator to control a number of unmanned vehicles could also expand the coverage potential of these systems without requiring an increase in personnel. The committee urges that the Navy's Roadmap for Information Dominance and other strategic planning documents be reviewed to ensure the potential contributions of unmanned vehicles, particularly UUVs, can be realized fully as soon as possible.

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

##### Overview

The budget request contained \$25.4 billion for research, development, test, and evaluation, Air Force. The committee recommends \$25.5 billion, an increase of \$85.0 million to the budget request.

The committee recommendations for the fiscal year 2013 research, development, test and evaluation, Air Force program are identified in division D of this Act.

## Items of Special Interest

*Aerial Networking*

The committee is aware of Air Force research and development efforts to help address significant and complex problems in aerial internet protocol (IP) networking, to include ensuring that IP-based networks deliver rapid, reliable, real-time tactical information. Such efforts are expected to make it easier for warfighters to dynamically configure and manage these aerial networks during periods of operational use. The committee believes the standardization of this IP-based architecture could provide tangible benefit to our warfighters.

The committee encourages the Air Force to expedite further operational testing of this new capability, including the potential for expanding the automation of the network and its management, addition of higher-capacity airborne backbone network resources, and improved use of satellite and other broadcast network resources which will be assimilated into the fielded capability. Following this testing, the Air Force is further encouraged to expand the scale of live testing and enable testing of different aerial network configurations with the eventual live flight testing in real-world environments to expedite the transition of this capability to fielded military programs.

*Aerospace Sensing and Measurement Standards*

The committee recognizes the role that standards play in accelerating the development of new and innovative technologies and removing barriers to trade, which increases American global competitiveness and provides technological advantages to the warfighter. The committee encourages the Department of Defense (DOD) to create a consortium of existing organizations to accelerate the development, adoption, and implementation of standards in sensing and measurement for the aerospace sector which will advance defense needs. The committee also encourages DOD to enter into partnerships with other federal agencies where such standards would be mutually beneficial.

*Enhanced Weather Data Support*

The committee is aware that advanced weather forecasts using Tropospheric Airborne Meteorological Data Reporting (TAMDAR) systems have been used by the Federal Aviation Administration, the U.S. Weather Service, and the National Oceanic and Atmospheric Administration for over seven years. The committee is also aware that advanced forecasting employing TAMDAR has the potential to enhance U.S. and allied meteorological forecasting systems, thus providing improved reliability and situational awareness. The committee encourages the Department of Defense to explore the possibility of utilizing TAMDAR in an operational context to determine its utility for defense missions.

*Global Positioning System*

Since its inception in the 1970s, the space-based architecture of the global positioning system (GPS) has remained generally the same. From the days of the early Block I satellites to the GPS III satellites under development today, the GPS signal from space has

been provided by a dedicated constellation of 24 to 31 satellites in medium earth orbit. The committee believes that the evolution of satellite and user equipment technology combined with today's constrained budget environment make this the right time to look at alternative architectures for the future global positioning system.

The committee directs the Commander of the Space and Missile System Center, U.S. Air Force, to provide a report to the congressional defense committees by December 1, 2012, on lower-cost solutions for providing GPS capability following the procurement of the GPS III satellites. The report should identify the system capability, possible implementation approach(es), technical and programmatic risks, and the estimated costs of any solution(s) it recommends.

The committee also directs the Comptroller General of the United States to review the report provided by the Commander of the Space and Missile System Center to the congressional defense committees, and to provide its recommendations to the congressional defense committees within 90 days after the date the report is received.

#### *Hypervelocity Ground Testing With Full-Scale Vehicles*

The budget request included \$232.6 million in Program Element (PE) 62203F for aerospace propulsion research and development activities, including hypervelocity ground testing activities with full-scale vehicles.

The committee supports maintaining the capability to conduct hypervelocity ground testing with full-scale air vehicles. The committee is aware that the Air Force maintains a number of hypervelocity wind tunnels that it shares with the other military departments, as well as civilian agencies like the National Aeronautics and Space Administration. The committee is also aware that as part of the fiscal year 2013 budget certification, the Test Resource Management Center opposed planned Air Force reductions that would have mothballed seven wind tunnels without assessing the impact on other agencies' programs or the cost to recover that mothballed capability in the future.

The committee recognizes the importance that hypersonic technology will play in meeting the defense needs of the future. The committee is concerned that U.S. hypersonics research, including the capability to conduct full-scale ground tests, may not be keeping pace with international efforts in this area. The committee believes that the Department of Defense (DOD) should maintain priority on research, development, test, and evaluation programs that support hypersonics technology. Specifically, the committee urges the DOD to continue utilizing hypervelocity ground testing of advanced systems similar to the X-51 scramjet demonstration system, the Falcon Hypersonic Test Vehicle-2, flyback booster systems, and the stage separation of hypersonic interceptor systems designed to perform launch-phase intercepts. The committee also urges the Air Force to continue to utilize this technology to support the reduction of costs and significantly reduce the risk of flight testing scramjet and rocket-powered short and long range hypervelocity weapon systems.

The committee recommends \$232.6 million, the full amount requested, in PE 62203F for aerospace propulsion research and development activities.

*Industrial Base for Space Surveillance Optics*

The committee is aware that the Defense Advanced Research Projects Agency has recently completed testing of the Space Surveillance Telescope (SST), and transitioned the program to the Air Force Space Command. The committee also recognizes that the Department of Defense's strategic budget guidance may have unexpected implications for the health and viability of the industrial base required to design, build, and maintain additional SSTs, including the polishing, repair, refurbishment, and availability of spares for the large diameter optics. The committee encourages the Assistant Secretary of the Air Force for Acquisition, Technology, and Logistics, along with the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy, to review the U.S. industrial base for large diameter optics to avoid the irreversible loss of the skilled workforce, and to ensure the Air Force and other agencies have future access to an industrial capability to provide precision large diameter optics.

*Infrared Search and Track System Development*

The budget request contained \$84.3 million in PE 24136N for continued development of an infrared search and track (IRST) capability for Navy F/A-18 aircraft, but contained no funding for development of an infrared search and track capability for Air Force F-15 or F-16 aircraft.

The committee supports the Navy's effort to rapidly develop the IRST capability for Navy F/A-18 aircraft and believes that the combination of this new sensor and the deployment of the AIM-9X Block II and AIM-120D air-to-air missile could provide a significant increase in capability in challenging electronic warfare environments. The committee is concerned, however, with the Air Force's lack of research and development investment in this potentially critical technology. The committee notes that even if the F-35 program remains on track, the Air Force will still operate the F-15 and F-16 for many decades. The committee believes that the addition of IRST capability to Air Force F-15 and F-16 aircraft could greatly enhance the value of these fourth generation fighter aircraft in the future. The committee encourages the Air Force to budget for investment and deployment of IRST capability as it develops its future budget requests.

The committee recommends \$84.3 million, the full amount requested, in PE 24136N for continued development of an infrared search and track (IRST) capability for Navy F/A-18 aircraft.

*Joint Space Operations Center Mission System*

The committee believes that (1) improvements to the space situational awareness and space command and control capabilities of the United States are necessary, and (2) the Department should leverage existing investments in government and commercial capabilities to the fullest extent practical.

The committee is aware that the Joint Space Operations Center Mission System (JMS) is a program of critical importance that is being designed to deliver an integrated, net-centric space situational awareness and command and control capability. The committee is also aware that this capability requires timely migration from fragile legacy components.

The committee commends the Air Force for restructuring the JMS program to reduce cost and accelerate transition by enabling competition and leveraging government and commercial applications. Ultimately, the committee expects the Air Force to select and/or develop the solution that best serves the warfighters' needs. The committee encourages the Department to fulfill its requirements by using existing or easily-modified Government and commercial applications, when possible, to achieve efficiency and cost effectiveness. The committee directs the Secretary of the Air Force, in coordination with the Office of Cost Assessment and Program Evaluation, to certify and report to the congressional defense committees within 270 days of the date of enactment of this act, that thorough market research and technical evaluation of relevant non-developmental items, that could provide a lower cost and earlier transition compared to a developmental solution, is completed during the acquisition process. The report should summarize the findings underpinning the certification. An interim report, in briefing format, should also be provided no later than March 1, 2013.

#### *Materials Affordability Initiative*

The budget request contained \$47.8 million in PE 63112F for advanced materials for weapons systems. Of that amount, \$3.9 million was requested for the Metals Affordability Initiative (MAI) program.

The committee notes that MAI is public-private partnership that includes the entire domestic specialty aerospace metals industrial manufacturing base, which produces the strategic and critical metals aluminum, beryllium, nickel-base superalloys and titanium. MAI projects have involved participants from over 60 additional industrial companies, including over 45 small businesses, 20 universities, and 3 National Laboratories located in 35 states. The committee recognizes that MAI has demonstrated significant improvements in the manufacture of specialty metals for aerospace applications for the government and aerospace industry, and provides the warfighter with metals of improved strength and durability, often at a reduced cost. The committee encourages the Air Force to expand government participation in MAI to include other military departments and defense agencies, and to look at opportunities to expand to areas of metals affordability beyond aerospace applications.

The committee recommends, \$57.8 million, an increase of \$10.0 million, in PE 63112F for the MAI program.

#### *Operationally Responsive Space*

The budget request contained \$10.0 million in PEs 63430F, 63423F, 63438F, 64441F, 64858F for five different programs to integrate the ORS concept into the entire space architecture. The budget request contained no funds in PE 64857F for the Operationally Responsive Space (ORS) program.

The committee is aware of the Department's plan to eliminate the Operationally Responsive Space program office and to transfer the remaining efforts to other space programs in order to better integrate the ORS concept into the entire space architecture. The committee is concerned with this plan and is not convinced that it will fully address joint military operational requirements for on-demand space support and reconstitution.

The John Warner National Defense Authorization Act for Fiscal Year 2007 (Public Law 109–364) established the ORS office to respond to the needs of the joint force commander and to build an enabling infrastructure to support the rapid deployment of space capabilities. ORS capabilities have the potential to reduce the fragility of the space architecture through rapid reconstitution, provide augmentation or surge capabilities, and offer a pathway for demonstrating new technology or operational concepts.

Therefore, the committee directs the Department of Defense Executive Agent for Space to submit to the congressional defense committees a detailed strategic plan by November 30, 2012, that addresses how the Air Force will implement the mission of the ORS program as laid out in section 2273a of title 10, United States Code: (1) to contribute to the development of low-cost, rapid reaction payloads, busses, space lift, and launch control capabilities, in order to fulfill joint military operational requirements for on-demand space support and reconstitution; and (2) to coordinate and execute operationally responsive space efforts across the Department of Defense with respect to planning, acquisition, and operations. The plan should address the required funding for implementing this mission and how it will preserve this program's alternative approach to space acquisition.

Because the committee does not have a detailed understanding of the Department's plan for preserving the ORS mission without the ORS program office, the committee rejects the Department's legislative proposal to repeal the current statute that requires the Secretary of Defense to establish an office to be known as the ORS program office.

The committee recommends a decrease of \$10 million, in PEs 63430F, 63423F, 63438F, 64441F, 64858F for the integration of the ORS concept into the entire space architecture. Instead, the committee recommends an increase of \$25.0 million in PE 64857F for the Department to continue the ORS program as it develops a strategic plan that addresses the mission of the ORS program office as laid out in section 2273a of title 10.

#### *Realignment of Airbase Technologies Division*

The committee notes that the Air Force Research Laboratory (AFRL) maintains an Airbase Technologies Division to research challenges associated with deploying and maintaining expeditionary airfields. The committee is aware that the Air Force is significantly reducing its investment in this area and ultimately plans to divest itself of this research program. The committee is concerned that there are 23 civilian billets associated with the Airbase Technologies Division, but that there is no plan for the disposition of that workforce. The committee recognizes that with the uncertainty over the future status of this workforce, the Air Force risks losing important skills and expertise as civilian scientists and engineers leave AFRL employment to pursue opportunities elsewhere. Therefore, the committee directs the Secretary of the Air Force to submit a report to the congressional defense committees within 90 days after the date of the date of enactment of this Act on the disposition plans for that workforce. The report should address the Air Force's plan for reassigning, realigning, or eliminating the residual workforce from the Airbase Technologies Division. It should also

address how the Air Force will meet future civil engineering resourcing and research and development requirements to ensure a viable, long term program.

#### *Space-Based Nuclear Detection*

The committee reaffirms the importance of a space-based nuclear detection capability. The committee has not yet received the plan required in section 419 of the Ike Skelton National Defense Authorization Act for Fiscal Year 2011 (Public Law 111-383) which required the Secretary of Defense in consultation with the Director of National Intelligence and the Administrator of the National Nuclear Security Administration to develop a way forward for space-based nuclear detection sensors. The committee notes that such a plan remains necessary to understand the way ahead to ensure that this capability is available, especially in the geosynchronous orbit, following the decision not to integrate the Space and Atmospheric Burst Reporting System into the Space Based Infrared System satellites. The committee expects that the requirement for maintaining nuclear detection capability will be addressed.

#### *Space Situational Awareness Fence Program*

The budget request contained \$267.3 million, in PE 64425F for continued development of the Space Fence system. The United States' reliance on space-based capabilities is growing exponentially; and, as summarized recently in the National Security Space Strategy, space is increasingly congested, contested, and competitive. Space debris is growing, increasing the potential for collisions with operational satellites and threatening our national security space assets. The Air Force Space Fence program will replace the existing surveillance system, over fifty years old, which does not have the capability to detect smaller objects and has significant coverage gaps in the southern hemisphere. The Space Fence is a major component of the nation's space situational awareness architecture.

The committee urges the Air Force to keep the program on schedule to provide the first S band radar surveillance site with initial operational capability for low and medium orbits by fiscal year 2017.

#### *Space Test Program*

The budget request contained \$10.1 million in PE 65864F for the Space Test Program (STP), a decrease of \$36.89 million.

The committee is concerned about the proposed cancellation of STP and its impact on long-term investment in space assets. Since 1965, STP has conducted space test missions for the purpose of accelerating the Department of Defense's (DOD) space technology transformation while lowering developmental risk. The cost-effective program flies an optimally selected number of DOD sponsored experiments consistent with priority, opportunity, and funding. The program serves a unique role in advancing technology that has become the foundation of core space capabilities.

The committee notes the statement in the President's budget justification that STP missions are the most cost-effective way to flight test new space system technologies, concepts, and designs.

The committee shares this assessment, but it is concerned by the STP proposed cancellation.

The committee recommends \$45.0 million, an increase of \$34.9 million, in PE 65864F for the Space Test Program.

*Specialized Undergraduate Flight Training Advanced Trainer Replacement*

The budget request contained \$1.6 million in PE 64233F for the advanced trainer replacement (T-X) program development. The T-X program is planned to replace the aging T-38C aircraft and its ground-based training system for advanced pilot training. The committee notes that the T-38C has been in service since 1962, and is now in its third service life with an average of more than 14,000 hours per aircraft.

The committee recognizes the importance of the T-X program and supports the Department of the Air Force's efforts to move forward with this critical initiative. The committee notes that, compared to the budget request for fiscal year 2012, the budget request for fiscal year 2013 would delay the T-X initial operational capability (IOC) from fiscal year 2017 to fiscal year 2020, and believes that any further delay in the program schedule may create safety and operational risks to future pilots through the operation of an aging T-38 fleet, while it may also increase fifth generation pilot training shortfalls for the F-22, F-35 and future long range strike aircraft. The committee is concerned that the budget request of \$1.6 million for fiscal year 2013, and \$6.0 million planned for fiscal year 2014, may not support the current acquisition schedule which would begin the engineering and manufacturing development (EMD) program phase in fiscal year 2014.

Therefore, the committee encourages the Department of the Air Force to review, and if necessary, revise its T-X program budget plans for the fiscal year 2014 budget request to support T-X program entry into the EMD phase not later than fiscal year 2014 so that the T-X IOC can be achieved in fiscal year 2020. Additionally, the committee understands that the Department plans to conduct its industry day, and other activities prior to its submission of a T-X request for proposal, in calendar year 2012, and urges the Department to adhere to this plan.

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

Overview

The budget request contained \$18.0 billion for research, development, test, and evaluation, Defense-Wide. The committee recommends \$18.5 billion, an increase of \$496.1 million to the budget request.

The committee recommendations for the fiscal year 2013 research, development, test, and evaluation, Defense-Wide program are identified in division D of this Act.

Items of Special Interest

*Active Denial Technology and Roadmap*

The committee is aware that more than \$120 million has been invested over more than a decade in the development of non-lethal,

directed energy active denial technology, yet the Department of Defense has not established a program of record, or fielded systems to our service members, despite a number of Urgent Operational Needs requests from field commanders. The committee strongly supports this non-lethal capability and has authorized continued funding for next generation solid state active denial technology to support the Army's Ground Combat Vehicle non-lethal requirements.

In 2006, the Department issued the only policy statement to date on active denial technology, noting "support for the development" of the technology, which "offers the possibility for wide-ranging application in multiple scenarios where we lack suitable means of anti-personnel action." The committee is concerned that a lack of further policy guidance for the continued development, deployment and export of active denial technology is inhibiting the utilization of this capability, even as other nations such as Russia has recently announced an intention to also begin development of this technology. The committee is equally concerned by recent inconsistent export licensing decisions related to the marketing and sale of this capability to international partners.

Therefore, the committee directs the Secretary of Defense to provide a policy update and roadmap for active denial technology, including the Active Denial System, to the congressional defense committees by July 16, 2012. The policy shall clarify the Department's position on the further development, deployment and export of the capability and the roadmap shall provide a detailed consideration of future funding, development and deployment plans; potential opportunities for leveraging U.S. investment by fielding the capability domestically and internationally; the Department's position, including specific criteria used to evaluate marketing and sales licenses (in coordination with the Department of State), for coalition partners to procure U.S. active denial technology.

#### *Aegis Ashore Program*

The budget request contained \$276.3 million in PE 64880C for the Land Based SM-3 or "Aegis Ashore" concept.

The committee notes that the 2010 Ballistic Missile Defense Review (BMDR) generated a requirement by the Administration to provide an Aegis capability ashore as a key component of the European Phased Adaptive Approach (EPAA). The committee further notes that two stalwart allies, Romania and Poland, have enthusiastically responded to United States plans to host an Aegis Ashore site in their countries.

The committee notes, in another section of this report, concerns expressed by the Government Accountability Office on the high concurrency and technological risk forced by the timeline for deployment of the Aegis Ashore system.

The committee recommends \$276.3 million, the full amount requested, in PE 64880C for the Land Based SM-3 or "Aegis Ashore" concept.

#### *Aegis Ballistic Missile Defense Combat System*

The budget request contained \$260.60 million in PE 64307N for the Surface Combatant Combat Systems Engineering for the Aegis Ballistic Missile Defense (BMD) Weapons System.

The committee notes that the Aegis BMD Weapons System is the world's premier proven naval defense system and the sea-based element of the U.S. Ballistic Missile Defense System. Aegis BMD plays an active role in protecting U.S. deployed forces and allies from enemy ballistic missile attack. The committee further notes that the Aegis BMD system has been included in the Administration's European Phased Adaptive Approach to missile defense and has undergone extensive and successful missile defense testing.

The committee recommends \$260.6 million, the full amount requested, in PE 64307N for the Surface Combatant Combat Systems Engineering for the Aegis Ballistic Missile Defense (BMD) Weapons System.

#### *Aegis Ballistic Missile Defense*

The budget request contained \$992.2 million in PE 63892C for the Aegis Ballistic Missile Defense (BMD) system.

The committee also supports the initiation of a Service Life Extension Program (SLEP) by the Director of the Missile Defense Agency, which could result in a significant increase in the service life of the SM-3 IA interceptor and the retention of as many as 41 IA interceptors in the inventory by the end of 2017 that would have otherwise been transitioned out of the fleet. The committee is aware combatant commander interest in ensuring the largest possible inventory of Aegis BMD interceptors.

The committee recommends \$992.2 million, the full amount requested, in PE 63892C for the BMD system.

#### *Airborne Infrared and Advanced Remote Sensor Technology*

The budget request contained \$58.7 million in PE 64886C for the Advanced Remote Sensor Technology (ARST).

The committee believes that early tracking and discrimination of ballistic missiles is critical in providing notification and essential cueing information to other Ballistic Missile Defense Systems (BMDS). The committee supported the Airborne Infrared system for this reason. The committee understands ARST is the Missile Defense Agency's (MDA) revised concept for this system. The committee believes that a forward-deployed ARST would enable existing BMDS radar assets to search a smaller volume with less radar energy required to detect threats. This translates to an increased raid threat handling capability.

While MDA's ultimate goal with the ARST program may be space-based sensors, the committee believes that the program could produce technologies and resulting capabilities with near-term applications beyond space. With continued development, these Airborne Infrared sensors could be used as a flexible, rapidly deployable missile defense system component to provide the earliest possible fine track and discrimination of boosting threat missiles. Moreover, advanced sensor technologies developed for missile defense also can provide benefits to other defense and intelligence missions, such as air-to-air engagements in difficult environments; airborne weapons layer surveillance, acquisition, cueing, and fire control; maritime domain awareness; and ballistic missile defense technical collection.

To prevent wasteful duplication of effort, the committee believes MDA should coordinate with the Services and the Intelligence

Community to ensure that all potential applications for ARST investments are considered fully and adequately. In particular, the MDA should ensure that advanced sensor development takes into consideration any near-term, non-space missile defense capabilities. Exploiting these technologies in multiple mission areas may also enable future cost sharing and technology transfer opportunities. The committee directs the Director, Missile Defense Agency to provide a report to the congressional defense committees within 180 days after the date of the enactment of this Act on the results of coordination with the military services and the intelligence community.

The committee recommends \$58.7 million, the amount of the request, in PE 64886C for ARST.

*AN/TPY-2 Radar*

The committee notes the exceptional capability of the TPY-2 radar, and believes such capability should be fully explored by the Defense Department. The committee is aware that there have been recent reports that provide recommendations for how to further the capability of this system.

The committee directs the Under Secretary of Acquisition, Technology, and Logistics to provide a report to the congressional defense committees by November 30, 2012, on the stacked TPY-2 array concept described in the National Academies “Assessment of Concepts and Systems for U.S. Boost-Phase Missile Defense in Comparison to Other Alternatives,” conducted pursuant to section 232 of the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009 (Public Law 110-417).

*Assessment on Inner-Aural Communications Hearing Protection Capabilities*

The committee is concerned that hearing loss continues to remain one of the most prevalent long-term injuries for military personnel. The committee is concerned that many military personnel may not wear their issued earplugs because current earplugs could potentially limit situational awareness as well as reduce the warfighter’s ability to communicate over handheld and man-portable radios. The committee understands that U.S. Special Operations Command has developed and fielded communications technology that both increases situational awareness and mitigates the risk of permanent hearing loss through the use of enhanced inner-aural hearing protection and hearing enhancement protective technology.

The committee believes that the military services should consider additional investment in such technology and directs the Under Secretary of Defense for Acquisition, Technology, and Logistics to brief the congressional defense committees within 180 days after the date of enactment of this Act on the status of the Department’s efforts in developing technology to reduce service-related hearing loss, as well as the advisability and feasibility of equipping military personnel with inner-aural communications hearing protection and enhancement systems that could potentially reduce the risk of hearing loss.

*Basic Research*

The committee is aware that funding for basic research is a critical component of the Department of Defense's strategy for maintaining technological superiority over future adversaries. While much of the recent focus on supporting the warfighter has been on satisfying requests for urgent operational needs, the committee recognizes that long-term modernization needs also require investment and attention. Not only do these basic research initiatives support cutting-edge scientific research, they also contribute significantly to undergraduate scholarships and graduate research fellowships that strengthen the U.S. scientific and technical workforce.

The committee notes that a recent Defense Science Board study has also determined that the Department's basic research program is valuable, comparable to other basic research programs in the government and well-suited to the needs of the Department. Therefore, the committee encourages the Department to continue to prioritize and protect these investments vital to the sustained health and future modernization of the military.

*Blast Gauges*

The committee is aware that the Defense Advanced Research Projects Agency (DARPA) recently completed a rapid development effort to field sensors to measure blast effects and provide gross measures indicating the potential for traumatic brain injury (TBI). DARPA developed a simple sensor, easily integrated into a soldier's ensemble, for a cost of less than \$50 per sensor. The committee understands that these sensors are now available through the Rapid Equipping Force to any unit that requests them. The committee encourages the military services to begin using these devices, and also to develop the necessary tactics, techniques, and procedures (TTP) to ensure proper employment, effective systematic data collection, and integration of that data into ongoing TBI research. To enhance the development of TTPs and data collection processes, the committee recommends that the Secretary of the Army and the Commandant of the Marine Corps identify and assign blast gauges to specific route clearance units to be deployed in the Islamic Republic of Afghanistan, or undergoing training in simulated blast environments, where these blast gauges can be utilized in a realistic operational setting.

*Chemical Demilitarization and Assembled Chemical Weapons Alternatives Program*

The committee notes that the Department of Defense recently approved and announced revised cost and schedule estimates for the final two U.S. chemical weapons destruction plants. The committee understands that the Assembled Chemical Weapons Alternatives (ACWA) program's life-cycle costs are now estimated at \$10.6 billion, with destruction completion estimates for the chemical weapons stockpiles located at Pueblo Chemical Depot, Colorado, adjusted to 2019 and at the Blue Grass Army Depot, Kentucky, to 2023. The committee further understands that this adds about \$2 billion and 2 years to a previous program estimate to allow additional time and resources if necessary.

The committee is also aware that the Department of Defense is considering a legislative proposal that would authorize ACWA to consider use of Explosive Destruction Technologies, and other technologies for the treatment and disposal of agent or energetic hydrolysates, if problems with the current on-site treatment of hydrolysates are encountered.

The committee is concerned that these proposals have not been properly coordinated with the congressional defense committees and that this issue warrants further review. Additionally, the committee is concerned that the revised cost and schedule estimates for the final two U.S. chemical weapons destruction plants may not accurately reflect potential costs out to the adjusted timelines of 2019 and 2023.

Therefore, the committee directs the Secretary of Defense to brief the congressional defense committees within 90 days after the date of the enactment of this Act on the recently approved revised cost and schedule estimates for the ACWA program and any legislative proposals or changes being considered by the Department of Defense in support of the Chemical Demilitarization and ACWA programs.

#### *Combating Terrorism and Emergency Response Technology Innovation*

The committee supports the research, development, testing, and evaluation (RDT&E) of certain technologies that combat terrorism, enhance emergency response capabilities, and enable U.S. Special Operations Forces (SOF). This includes technologies that facilitate worldwide communications, improve situational awareness, and enable command and control. The committee also supports the development of certain technologies that would utilize mobile training content and distance learning capabilities to realize efficiencies and improve SOF and first responder proficiency in these critical areas. The committee therefore encourages the Assistant Secretary of Defense for Special Operations and Low Intensity Conflict to continue RDT&E of certain technologies that support combating terrorism, emergency response, and U.S. SOF through offices and organizations such as the Combating Terrorism Technical Support Office and the Technical Support Working Group.

#### *Comparative Effectiveness Research for Orthotics and Prosthetics*

The committee is aware that the use of improvised explosive devices (IED) in the Republic of Iraq and the Islamic Republic of Afghanistan has resulted in amputations becoming signature injuries for this generation of service members. The committee also recognizes that as IED threats continue to challenge U.S. forces in the future, so will the threat of amputation injuries. As a result, growing numbers of service members require sophisticated orthotic and prosthetic care to respond to these and other related injuries. The committee notes that there is little comparative effectiveness and outcomes-based research to establish the most appropriate services, supports, and devices for different types of orthotic and prosthetic patients. To deal with the long-term challenges posed by these kinds of injuries, the committee believes the Department of Defense should initiate a comparative effectiveness research program for orthotics and prosthetics.

*Concerns Related to High Concurrency and Technical Risk Associated with the EPAA*

The committee is aware that each year, the Government Accountability Office (GAO) prepares a report for the congressional defense committees on the missile defense programs of the United States pursuant to a mandate in the national defense authorization acts since 2002.

The committee was pleased to see in the report prepared for fiscal year 2011 that the GAO found that MDA has achieved successes in areas like the delivery and performance of its targets, which has been a concern in the past.

The committee is, however, concerned by GAO's findings in its draft fiscal year 2012 report that "during 2011, the Ground-Based Midcourse Defense (GMD) system, the Aegis Standard Missile 3 Block IB, and the Terminal High Altitude Area Defense experienced significant ill effects from concurrency."

For nearly every missile defense program the GAO found high levels of concurrency, which is defined as "the overlap between technology development or between product development and production." GAO found that the discovery of a design problem in the ground-based midcourse defense (GMD) interceptors, mod CE2, while production was under way increased costs, may require retrofit of fielded equipment, and delayed delivery of those interceptors. As a result, flight and other test-related costs to confirm capability have increased from \$236 million to about \$1 billion; the committee notes these costs involve four flight tests of the CE2 equipped interceptor.

GAO also noted concurrency problems with regard to the many systems and programs that relate to the European Phased Adaptive Approach (EPAA) to deploy missile defense in Europe: specifically the Aegis Ashore system, and potential implications for the Romania Aegis Ashore deployment to Romanian civil systems; the Precision Tracking Space System; and the SM-3 IB, IIA, and IIB missiles.

The committee notes that concurrency has affected many areas of the missile defense system and no system appears to have been spared that concurrency, including the GMD system. Regarding GMD, the committee is aware of the compressed timelines to deploy missile defenses when the United States withdrew from the Anti-ballistic Missile Treaty in 2002. In that circumstance, the United States had no homeland missile defense and raced to deploy it to defend the homeland.

In the case of other systems, such as the EPAA's SM-3 IIB, the committee notes that the GAO has stated that "the need to meet the presidential directive to field the SM-3 Block IIB by the 2020 timeframe for European PAA Phase IV is a key driver for the high levels of concurrency." The committee encourages MDA to learn from these past mistakes.

The committee directs the Missile Defense Executive Board (MDEB) to report to the congressional defense committees not later than September 15, 2012, on its plans to address the risks noted by the GAO in its April 2012 draft report; this report should include an evaluation of mitigations and their costs that may be necessary if the risks highlighted by GAO are not resolved on a schedule consistent with the timelines articulated in the Ballistic Missile

Defense Review of 2010 concerning the EPAA's four-phased deployment and consistent with the plan to update and field additional GMD systems.

The committee further notes that the OSD Cost Assessment and Program Evaluation office is currently working to develop a comprehensive cost of the EPAA. The Committee expects the final cost projection to be provided not later than the MDEB report required by this section.

#### *Conventional Prompt Global Strike*

The budget request contained \$110.4 million in PE 64165D8Z for conventional prompt global strike (CPGS) capability development.

The budget request would fund the design, development, and experimentation of boosters, payload delivery vehicles, non-nuclear warheads, guidance systems, and mission planning and enabling capabilities with the goal of competitive acquisition beginning in fiscal year 2013 or fiscal year 2014. The committee understands that timing will be driven by the outcome of flight events and the budget.

The committee notes that while the first two HTV-2 tests were unsuccessful (though it provided meaningful data for review and concept development), the Army's Advanced Hypersonic Weapon (AHW) concept, developed in concert with the Sandia National Laboratory, was a success. The committee encourages the Department to continue cost-effective technology development and demonstration by leveraging the successful flight test of the AHW FT-1A glide body and by utilizing this ongoing program that can support prompt global strike acquisition programs across the Department.

The committee encourages a broader examination of the trade space of CPGS capabilities and concepts to meet warfighter requirements. The committee is mindful of the letter received by the Subcommittee on Strategic Forces on May 20, 2011, from the Under Secretary of Acquisition, Technology, and Logistics that stated: "The Department remains committed to using industry competition for driving productivity and managing program risks and costs. It is my intent to promote competition in all areas of CPGS acquisition at the system, subsystem, and component levels." The committee understands that this continues to be the Department's approach and commends the Department for it.

The committee also encourages the Department to draw on the lessons of the 2008 National Academy of Sciences review and final report "U.S. Conventional Prompt Global Strike: Issues for 2008 and Beyond," completed pursuant to the conference report (H. Rept. 109-707) accompanying the Department of Defense Appropriations Act, 2007 in which the conferees recommended a series of verification and transparency measures, in the context of their recommendation for development of CPGS, that could address concerns related to verification, transparency, and nuclear versus non-nuclear discrimination.

Therefore, the committee directs that the Secretary of Defense to provide a report to the congressional defense committees by December 1, 2012, detailing how the Department plans to use competition and integrate verification and transparency measures as it develops and deploys CPGS capabilities.

The committee recommends \$110.4 million, the amount of the request, in PE 64165D8Z for conventional prompt global strike (CPGS) capability development.

#### *Counterterrorism and Irregular Warfare Capabilities*

The budget request contained \$77.1 million in PE 63122D for activities in the Combating Terrorism Technical Support Office (CTTSO). The budget request also contained \$26.3 million in PE 63121D for activities in Special Operations/Low-Intensity Conflict Advanced Development. Of the amount, \$7.5 million was requested for the Explosive Ordnance Disposal/Low-Intensity Conflict (EOD/LIC) program, \$13.0 million was for the Irregular Warfare Support (IWS) program, and \$1.9 million was for Information Dissemination Concepts.

The committee notes that according to the Department of Defense (DOD) new strategic guidance released in January 2012, “counter terrorism and irregular warfare” will remain primary DOD missions and, furthermore, that the Department “will continue to build and sustain tailored capabilities appropriate for counter terrorism and irregular warfare.” The committee believes that irregular warfare (IW) will be the likely form of warfare confronting the United States, and that developing and institutionalizing IW capability across the military services is critical to military success.

The committee notes that CTTSO plays a unique role in front-end research, development, test, and evaluation (RDT&E) to help warfighters rapidly acquire “tailored capabilities” for counterterrorism and IW. Under the authority of the Assistant Secretary of Defense for Special Operations/Low-Intensity Conflict (ASD SO/LIC), CTTSO works with interagency and international partners to identify combating terrorism capability requirements; select promising proposals for advanced technology development; and rapidly deliver capability to the warfighter through RDT&E support. The committee has consistently recognized the value CTTSO adds to rapid acquisition of IW capabilities through its business process for evaluating proposals; experience interacting with numerous interagency and international partners; and expertise in advanced development prototyping. Specifically, the committee report (H. Rept. 111–491) accompanying the National Defense Authorization Act of Fiscal Year 2011, praised the Irregular Warfare Support (IWS) Legacy program for being “immediately effective in disrupting terrorist network activities, saving lives, and building a leave-behind indigenous capability.” The committee noted that the Legacy program is one of many CTTSO programs that develop innovative, non-materiel, and multi-disciplinary methodologies and strategies for disrupting irregular and asymmetric threats and also directed the Secretary of Defense to assess the program’s applicability against other network-based threats.

The committee has expressed concerns regarding CTTSO’s location under ASD SO/LIC and the limited funding it receives compared to the emphasis on IW within DOD strategies. In the conference report (H. Rept. 111–288) accompanying the National Defense Authorization Act for Fiscal Year 2010, the conferees expressed concern that, “(1) this small program office in the Office of the Secretary of Defense appears to be the only entity in the De-

partment, and perhaps in the executive branch, engaged in these types of activities; and (2) that so little funding is requested each year to sustain such activities and to scale up those that prove to be successful.”

The committee notes that CTTSO has program management authority for three sub-organizations: the Technical Support Working Group (TSWG), the EOD/LIC program, and the IWS program. The committee is concerned that projected funding for IWS, EOD/LIC, and Information Dissemination Concepts (IDC) are reduced across the Future Years Defense Program (FYDP) before being eliminated in fiscal year 2016.

Given the Department’s guidance to “build and sustain tailored capabilities” for IW missions, the likelihood that future challenges will be irregular in nature, and the enduring need to maintain a robust RDT&E and flexible procurement and acquisition capabilities to support IW requirements, the committee urges the Secretary of Defense to reexamine the funding reductions to IWS, EOD/LIC, and IDC through fiscal year 2016.

The committee directs the Secretary of Defense, in coordination with the Assistant Secretary of Defense for Special Operations and Low Intensity Conflict, the Director of the Office of Secretary of Defense for Cost Assessment and Program Evaluation and other relevant offices, to include those within the Under Secretary of Defense for Intelligence, to brief the congressional defense committees within 90 days after the date of the enactment of this Act on CTTSO funding changes over the FYDP and present options for fulfilling IW rapid capability development gaps if funding is eliminated for the IWS program, EOD/LIC, and IDC.

The committee recommends \$102.1 million, an increase of \$25.0 million, in PE 63122D for activities in the Combating Terrorism Technical Support Office (CTTSO).

#### *Critical Gaps in Undersea Mobility Capabilities*

The budget request contained \$26.4 million in Program Element (PE)1160483BB for Special Operations Forces Underwater Systems.

The committee is aware that U.S. Special Operations Command (USSOCOM) has realigned the Undersea Mobility Program to comply with the additional oversight requirements pursuant to Section 144 of the National Defense Authorization Act of Fiscal Year 2012 (Public Law 112–81). The committee is also aware that the proposed program structure for fiscal year 2013 includes scaled-down requirements for dry combat submersibles to operate via host surface ship only with moderate capacity and varying endurance. The committee is concerned that frequent program and strategy changes to the Undersea Mobility Program and a lack of funding priority in critical research, development, testing and evaluation, have delayed the introduction of advanced capabilities for both wet combat submersible replacement and dry combat submersible development.

The committee is concerned that the current program schedule for dry combat submersibles, in particular, will not field an operational evaluation platform until early 2015 with extended integrated testing not taking place until 2016. Given current dry combat submersible capability gaps and a potential shift in strategic

emphasis to the Asia-Pacific and other regions that present anti-access and area-denial challenges, the committee is concerned that USSOCOM's Undersea Mobility Program will be unable to meet potential geographic combatant command requirements to operate in denied maritime areas from strategic distances. Additionally, the committee is concerned that the highly perishable and technical skill sets required to operate wet and dry combat submersibles resident within the Naval Special Warfare community have not been fully exercised and utilized in recent years, thereby increasing capability gaps and risks to the overall program.

The committee has previously expressed concern with these current capability gaps and recognized the operational importance of the Undersea Mobility Program to provide technologically-advanced undersea mobility platforms for U.S. Naval Special Warfare Command and USSOCOM. The committee therefore encourages the Commander of U.S. Special Operations Command to review the current Undersea Mobility Program to mitigate risk, potentially accelerate the fielding of safe, efficient, and financially sound operational wet and dry systems, and to continually communicate with the congressional defense committees to ensure programmatic success and prevent previous program shortfalls.

The committee recommends \$61.4 million, an increase of \$35 million, Special Operations Forces Underwater Systems.

#### *Cyber Research of Embedded Systems*

The committee is aware that the Department of Defense (DOD) has increased focus and resources on dealing with cyber security threats to DOD networks and systems. The committee also notes that the decreasing size and increasing computational power of many microelectronics has helped embed computers into practically every weapons system within the Department, leading to an exponential increase in the complexity of protecting those systems. A 2010 report by the JASON Program Office noted that, "while the level of effort expended in securing networks and computers is significant, current approaches in this area overly rely on empiricism and are viewed to have had only limited success."

The committee supports the Department's strategy for securing its computer networks and systems, but also urges the Department to embrace a broader research agenda to protect all computing resources, including embedded systems. The committee believes that Centers of Excellence exist within military organizations, and should be resourced to carry out the research, in addition to the development, of suitable defensive capabilities. As necessary, the committee also encourages the Department to look at fostering cybersecurity capabilities in organizations that traditionally may not have been involved in information systems protection, in order to explore new approaches and expand the overall capability base.

#### *Defense Microelectronics*

The committee is concerned about the state of defense microelectronics, with regard to both the availability of a trusted supply chain, as well as the long-term health and vitality of the industrial base. The committee fully recognizes the critical importance to the Department of Defense of sustaining and improving the supply of trusted semiconductors, supply chain components and inspection

tools manufactured in the U.S. The committee is also concerned that the Department's lack of a comprehensive microelectronics strategy, as called for by the Senate committee report (S. Rept. 112-26) accompanying the National Defense Authorization Act for Fiscal Year 2012, poses a challenge in supporting decisions regarding what course of action may be most beneficial to that industrial base.

The committee recognizes the changing nature of the microelectronics industrial base, as well as the significant cost pressures associated with recapitalization and retooling to accommodate these changes. The committee is aware that industry is potentially facing a major transition to larger sized, 450mm wafers that will allow the manufacture of more advanced semiconductor devices at a lower cost. The committee believes that to get there will likely require the development of the next generation of manufacturing tools. The committee recognizes the value of pursuing technology research for other technologies that support fabless and maskless semiconductor development as a way to change the paradigm for the microelectronics industrial sector. The committee urges the Secretary of Defense to complete the requested defense microelectronics study, which should examine ways of supporting further technology development for fabless and maskless semiconductor production, as well as manufacturing tools for 450 mm wafers. Furthermore, the committee encourages the Deputy Secretary of Defense for Manufacturing and Industrial Base Policy to examine the challenges to the microelectronics industrial base during its Sector-by-Sector, Tier-by-Tier analyses.

Finally, the committee recognizes the need to maintain and sustain an in-house capability to design and manufacture obsolete and hard-to-find microelectronics that complements but does not compete with industry. The committee is aware that the Department relies upon some types of microelectronics for decades, during which time commercial sources may no longer be available. Commercial pressures and incentives typically do not align with Department needs for low production quantity and long sustainment periods, driving the need for in-house solutions. The committee is also aware that the threat to U.S. microelectronics is complex, ranging from counterfeit parts to sophisticated manipulation of commercially available products. The committee notes that the Defense Microelectronics Activity (DMEA) is focused on the unique and trusted strategic semiconductor supply chain requirements of the U.S. government in the short and long term. The committee supports the mission of DMEA, provided it continues to maintain processes and capabilities that leverage industry without inadvertently competing with it.

*Department of Defense Unmanned Aircraft System Operations in the National Airspace System*

The budget request contained \$7.7 million in PE 35219A, \$18.0 million in PE 35220F, \$0.7 million in PE 63211F, and \$8.9 million in PE 64400D8Z for sense and avoid technology development to further unmanned aircraft system (UAS) operations in the National Airspace System (NAS). The budget request also included \$37.7 million in Aircraft Procurement, Army, for procurement of Ground Based Sense and Avoid (GBSAA) systems for the Grey

Eagle UAS program to comply with Federal Aviation Administration requirements to “sense and avoid” and permit expanded training opportunities and operation of the Grey Eagle unmanned aerial vehicle in the national airspace.

The committee supports these projects. UAS have become a significant component of the Nation’s defense capability, as well as having the potential to provide support during a crisis and disaster response. The committee also recognizes the contribution that the Joint Planning and Development Office’s (JPDO) report, “NextGen Unmanned Aircraft Systems Research, Development and Demonstration Roadmap,” dated March 15, 2012, has made by providing a multi-agency perspective of the technology required to enable UAS operations and integration in the next generation NAS. The report is a joint publication of the Federal Aviation Administration, the National Aeronautics and Space Administration, the Department of Defense (DOD), the Department of Commerce, and the Department of Homeland Security. The committee supports and encourages a collaborative relationship between the Department of Defense and other JPDO partners in order to expedite development of the necessary technologies to solve the challenges of UAS–NAS integration.

While supporting the Department of Defense’s investment in “sense and avoid” technologies and system development, the committee is concerned about the overall plan for development and system fielding. Therefore, the committee directs the Under Secretary of Defense for Acquisition, Technology, and Logistics, in coordination with the Secretaries of the military departments, to provide a report to the congressional defense committees, the Senate Select Committee on Intelligence, and the House Permanent Select Committee on Intelligence within 180 days after the date of the enactment of this Act on current DOD capabilities and the program for GBSAA and airborne sense and avoid (ABSAA) development and fielding in support of UAS operations in the NAS. The report should include: the technology development and procurement roadmap for the Office of the Secretary of Defense and the military services, and include the required capabilities and systems for each, as applicable; the fiscal year 2013 Future Years Defense Program research and development and procurement budgets for each; a description of the technology development progress made and procurement actions taken to date; and the current GBSAA and ABSAA fielded capabilities. Finally, the report should include the projects the Department of Defense intends to address that are included in the multi-agency JPDO report, “NextGen UAS Research, Development, and Demonstration Roadmap.”

*Design Research to Improve Safety of Health Information Technology*

The committee is aware that the Department of Defense has made substantial investments in sustaining the current generation of health information technology (IT) systems, and working with the Department of Veterans Affairs to develop the next generation of electronic health records. However, the committee is concerned that the Department has not focused sufficient resources on research to improve design usability of the human-machine interface for these systems prior to entering system development. The com-

mittee notes that a recent study by the National Academies Institute of Medicine titled, “Health IT and Patient Safety: Building Safer Systems for Better Care” linked patient safety to sound design and development. As the report stated, research is needed to identify characteristics of safe systems and additional research is needed specifically about the impact of design deficiencies on patient impact.

Therefore, the committee directs the Assistant Secretary of Defense for Research and Engineering, in coordination with the Assistant Secretary of Defense for Health Affairs and the Deputy Chief Management Officer, to brief the House Committee on Armed Services within 90 days after the date of the enactment of this Act on research being conducted within the Department of Defense related to human-machine interfaces for design usability of health IT systems. Areas of supporting research may include:

- (1) User-centered design and human factors applied to health IT;
- (2) Safe implementation and use of health IT by all users;
- (3) Socio-technical systems associated with health IT; and
- (4) Impact of policy decisions on health IT use in clinical practice.

The briefing should also address how the research is being integrated into current health IT programs, as well as identify any gaps where additional research should be initiated.

#### *Detection of Non-Signature Based Cyber Threats*

The committee is concerned that the Department of Defense is not providing sufficient resources to acquire capabilities to detect and protect against cyber threats for which a signature has not yet been developed. The need persists for real-time detection and mitigation of non-signature-based threats that can operate in high-bandwidth networks and can also evaluate network traffic for malicious activity. The committee is aware that there are technologies that might address the need, but they require additional development, testing, and operational evaluation. The committee recommends that the Department establish a process for rapidly identifying, testing and evaluating potential solutions and accelerate adoption and implementation of those technologies to meet this pressing need.

#### *Diluted Nerve Agent Laboratory Decertification*

The committee commends the US Army Medical Research Institute for Chemical Defense (USAMRICD) for its critical research in the area of medical chemical countermeasures research and development. However, the committee is aware that USAMRICD is decertifying all laboratories in the handling and administration of dilute agent with the exception of the Battelle Memorial Institute’s Biomedical Research Center and the USAMRICD Collaborative Research Facility at Aberdeen Proving Ground. Decertified laboratories will be required to transfer their research to these approved facilities in order to continue working with diluted agents.

While the committee is aware of the budget and safety concerns that influenced this decision, the committee remains concerned about the potential negative consequences that will result from the transfer of research to these two facilities. The committee is par-

ticularly concerned about the effects that this move will have on research that advances of treatments for nerve agent-induced neurotoxicity.

Therefore, the committee directs the Secretary of Defense to brief the House Committee on Armed Services no later than 90 days after enactment of this Act on the potential impact on diluted agent research due to this change, and the plans to mitigate that impact.

#### *Directed Energy Missile Defense Program*

The budget request contained \$46.9 million in PE 63901C for Directed Energy Research.

The committee notes that this year's budget request terminates the Airborne Laser Test Bed program. This program demonstrated the world's first megawatt class airborne laser, tracked 11 boosting missiles, and destroyed a foreign material asset ballistic missile. The committee notes, however, that the Government Accountability Office in 2011 had expressed concern about continuing technical issues affecting the test bed's experiments and about flight test failures.

The committee directs the Director, Missile Defense Agency to provide a report to the congressional defense committee by July 31, 2012, on the costs involved with returning the Airborne Laser aircraft to an operational readiness status to continue technology development and testing, and to be ready to deploy in an operational contingency, if needed, to respond to rapidly developing threats from the Democratic People's Republic of Korea.

The committee recommends \$76.9 million, an increase of \$30.0 million, in PE 63901C to enable MDA to preserve the skilled workforce that was involved in the Airborne Laser Test Bed program and to accelerate experimentation with next generation directed energy system development, including the planned testing of the Phantom Eye system. The committee believes these funds can also support and accelerate the directed energy research applicable to missile defense that is occurring at the nuclear weapons laboratories.

#### *Early Development Activities to Improve Acquisition Outcomes*

The committee notes that the Department of Defense (DOD) has made a number of improvements to respond to the concerns raised by the Weapon Systems Acquisition Reform Act of 2009 (Public Law 111-23) related to the inadequacy pre-developmental planning and systems engineering. The committee is encouraged that the Department has placed greater emphasis on making improvements earlier in the pre-acquisition stages of the developmental cycle. In addition, the committee notes that each of the military departments has implemented, or is proposing to implement, improvements that are intended to pay dividends in the near future. For example, the Air Force has implemented funding for requirements analysis and maturation in order to do more rigorous developmental planning before programs are proposed. The Army has initiated a technology maturation program element that should improve the transition of promising science and technology research into programs of record. In compliance with Public Law 111-23, the Office of the Assistant Secretary of Defense for Research and

Engineering (OASD (R&E)) is growing a cadre within its organization to improve systems engineering and developmental testing. The committee notes that the budget request contained an additional request for OASD (R&E) to have the authority to initiate a new project called “The Effects Chain Analysis Cell” which is intended to provide modeling and simulation tools for planners to do more quantitative trade space analysis as part of the analysis of alternatives. The committee supports this request.

#### *Foreign Materiel Exploitation*

The committee is concerned that the level of sophistication in foreign systems has increased exponentially over the past decade, primarily due to widespread use of complex digital devices, such as digital radio frequency memory (DRFM) and field-programmable gate arrays (FPGA). These systems are proliferating at an alarming rate and pose a serious threat to the national security and critical domestic infrastructure.

The committee is further concerned that there are insufficient facilities for classified lab space to conduct integrated weapon system analysis, which limits the quality and quantity of foreign threat data provided to the warfighter, acquisition community, and policymakers. This deprives the intelligence community of an opportunity to generate scientific and technical intelligence (S&TI) that has historically proven a key driver for the development of tactics, techniques, and procedures, and force modernization requirements. Lower volume and quality of S&TI increases the risk of technological surprise encountered on the battlefield, ultimately increasing the vulnerability of U.S. forces in future conflicts.

Therefore, the committee urges the Department of Defense to take all steps necessary to ensure the military departments and defense agencies have the facilities and resources necessary to exploit and counter current foreign military systems.

#### *Ground-Based Midcourse Defense*

The budget request contained \$903.1 million in PE 63882C for the Ground-based Midcourse Defense (GMD) system. The committee recommends fully funding the President’s request of \$903.1 million, and the committee recommends an additional \$356.284 million for PE 63882C for fiscal year 2013, which this section would authorize.

The committee is aware that the Ground-based Midcourse Defense (GMD) system is the only system that presently provides missile defense protection to the United States, and it will remain the only system able to provide that defense until at least 2020, assuming the SM-3 IIB missile is able to provide protection for the homeland in that year. The committee has noted elsewhere in this report the concerns about the acquisition strategy and other concerns about the IIB raised by the Government Accountability Office, the Defense Science Board, and the National Academies.

The last two intercept flight tests of the GMD system, FTG-06 in January 2010 and FTG-06a in December 2010, failed to achieve intercept. The committee is aware that these two tests involved the CE2 interceptor, as opposed to the CE1 interceptor, which is three for three in successful tests. The committee notes these three tests were not threat representative against an intercontinental ballistic

missile, which the committee addresses in another section of this report.

The committee understands that the FTG-06 failure was principally due to a quality control issue associated with a component in the exo-atmospheric kill vehicle (EKV). The FTG-06a failure is still under investigation but is also centered on technical issues involving the EKV. The committee does not believe the appropriate reaction to these difficulties is to cut the GMD budget.

The committee fully supports the request for an additional five ground-based interceptors (GBI) to provide additional flight test and reliability assets, though the committee is concerned that even with these assets, there will not be sufficient resources for GBI acquisition to support a more robust GMD test program, which it recommends elsewhere in this section.

The committee notes that improvement of the EKV was intended from the very outset of the original GBI program. The decision by the administration to cancel the Multiple Kill Vehicle program and curtail further GBI development means there is now no program to substantially improve or upgrade the current EKV through its intended life until 2030. The committee is concerned that without significant improvement, such as a next-generation kill vehicle for the GBI, the GMD system may not be able to keep pace with future threats. The committee includes a recommendation to address this concern in another provision of this report.

The committee recommends \$1.3 billion, an increase of \$357.0 million, in PE 23735A for the AMPV program.

#### *Information Technology Discharge Solutions*

The committee is aware that some non-Department of Defense acute care medical facilities utilize automated referral and discharge processes known as Information Technology Discharge Solutions (ITDS). These systems have the potential to provide cost-avoidance and expeditious and seamless discharges from acute care facilities. Therefore, the committee encourages the Department of Defense to explore the feasibility of utilizing an ITDS in military treatment medical facilities in order to determine how such systems could integrate into the existing information technology architecture and potentially save costs, improve throughput, minimize safety risks, and improve the efficiency of military medical facilities.

#### *Innovation Program at the Defense Information Systems Agency*

The committee is aware that the ability to innovate is important for any agency within the Department of Defense, and is especially important for any information technology (IT) investments. For this reason, the committee recognizes the need for the Defense Information Systems Agency (DISA) to have stable and robust funding to support its ability to develop, assess, and integrate emerging IT solutions that have the potential to add great value to the Global Information Grid. The committee believes that DISA's Chief Technology Officer has crafted an effective vision for leveraging these funds to field critical new warfighting capabilities and concepts through such vehicles as Joint Capability Technology Demonstrations. The committee encourages DISA to continue to pursue opportunities to broaden and deepen its innovation capacity, and encour-

ages DISA to pursue new funding sources like the Rapid Innovation Fund to do so.

#### *Israeli Cooperative Missile Defense*

The budget request contained \$99.9 million in PE 63913C for Israeli cooperative programs for the Missile Defense Agency (MDA). Of this amount, \$10.7 million is requested for the Arrow Weapon System (AWS) improvement program, \$50.9 million is requested for the Arrow-3 upper tier system, and \$38.3 million is requested for the David's Sling Weapons System (DSWS).

The fiscal year 2013 request represents a decrease of \$136 million from the fiscal year 2012 appropriated level.

The committee supports and recommends this request and recommends an increase of \$168 million as requested by Government of Israel to meet its security requirements, of which \$23.8 million is to be provided to the Arrow-3 upper tier system, \$33.7 million is to be provided to accelerate improvements to the AWS improvement program, \$72.2 million is to be provided to the joint development of the DSWS, and \$39.3 million is to be provided for DSWS co-production activities.

The committee notes that the threats from ballistic missiles are a direct and increasing danger to the state of Israel. The committee believes that cooperation with Israel, one of America's closest allies, remains one of the most important defense relationships.

The committee also notes that the increase it is recommending above the President's request is significant. The committee believes that the Director, MDA should, when working with Israel on the expenditure of these funds, ensure that there is minimal program risk posed by any acceleration of program knowledge points through this recommended funding increase.

The committee also recommends a provision elsewhere in this section that would provide a significant authorization of funds for the Iron Dome short-range rocket defense system.

#### *Medical Countermeasures Advanced Development and Manufacturing*

The committee is aware that the Department of Defense (DOD) is pursuing a medical countermeasure capability to rapidly counter known and unknown chemical, biological, radiological, and nuclear threats, including novel and previously unrecognized, naturally occurring infectious diseases. The committee understands that this program will provide a dedicated, flexible, adaptive, and scalable advanced development manufacturing Center of Excellence to meet DOD requirements in this critical area.

While aware of the unique requirements for the Department and the need to have a program serving those distinct requirements, the committee remains concerned that costly duplication and inefficiencies exist in the area of bio-defense across Federal agencies, as detailed in the recent Government Accountability Office (GAO) report (GAO-11-318SP) "Opportunities to Reduce Potential Duplication in Government Programs, Save Tax Dollars, and Enhance Revenue," which noted that Federal agencies are unable to account for bio-defense spending across the entire Federal Government.

The committee encourages continual and effective interagency coordination, in particular between the Department of Defense and

the Department of Health and Human Services, and the continued utilization of the “Integrated Portfolio for Chemical, Biological, Radiological and Nuclear Medical Countermeasures” as a forum to reduce duplication, realize efficiencies, and save tax dollars. The committee also encourages close integration and coordination between the medical countermeasure enterprise and the broader Joint Program Office for Chemical-Biological Defense to ensure efficiencies are realized, requirements are properly identified, and capabilities are rapidly fielded in the area of medical countermeasures, including the potential merging of Joint Program Management offices dealing with Transformational Medical Technologies, and Chemical, Biological Medical Systems.

In addition, the committee directs the Secretary of Defense to provide a briefing to the House Committee on Armed Services within 90 days after the date of the enactment of this Act, outlining efforts to implement a strategic plan for all Departmental medical countermeasures activities, including Advanced Development and Manufacturing, Transformational Medical Technologies Initiative, the Medical Countermeasure Initiative, and similar activities designed to produce a medical countermeasure capability that will rapidly counter known and unknown chemical, biological, radiological and nuclear threats. The briefing should also include an overview of how these medical efforts and initiatives will be managed and balanced within the broader Chemical-Biological Defense Program to ensure that all Joint Service requirements are met including chemical and other non-medical programs.

#### *Medium Extended Altitude Defense System*

The budget request contained \$400.9 million in PE 64869A for the Medium Extended Altitude Defense System (MEADS).

The committee is concerned that it does not have a complete picture of all MEADS-related expenses. The committee is aware that the MEADS agreement committed the United States to a total cost of \$2.4 billion, but budget documents suggest the United States may have expended, or be planning to expend, in excess of \$3.0 billion. Therefore, the committee directs the Secretary of Defense to provide a report to the congressional defense committees by May 31, 2012, on all MEADS and MEADS-related expenses incurred, or planned, by the United States.

The committee recommends no funds, a decrease of \$400.9 million, in PE 64869A for MEADS. Elsewhere in this title, the committee includes a provision in which the committee details its concerns with MEADS and its rationale for authorizing no funds for the program in fiscal year 2013.

#### *Mitochondrial Research*

The committee recognizes that many service members returning from the conflicts in Iraq and Afghanistan potentially have some form of Traumatic Brain Injury (TBI), and that they may represent a larger proportion of U.S. casualties than those sustained in other recent conflicts. The committee notes that there is a growing body of research indicating that TBI-related impairments may be the result of damage to human cell mitochondria sustained during and following a blast event. The committee notes that researchers believe that an enhanced understanding of post-injury mitochondria

may help target therapeutic interventions, potentially delaying or preventing additional impairment or disability. In order to support and potentially enhance the treatment of TBI-related injuries, including the long-term impact on veteran's physical and mental health, the committee encourages the Department of Defense to explore further medical research into the mitochondrial linkages to TBI effects through its various medical research entities across the services.

#### *Modeling and Simulation for Cyber*

The committee is aware that poor software programming is a major contributor to critical vulnerabilities in many software-intensive systems. The committee is also aware that efforts exist to improve software coding best practices, including through the adoption of best practices in the curricula of major computer science programs. The committee urges the Department of Defense to accelerate efforts under way to conduct secure software coding experiments and data analysis to determine which secure coding guidelines are practiced and effective, and to develop a template for scalable cyber modeling and simulation. The committee believes such templates are necessary to improve understanding of the cyber threat, improve mitigation efforts, increase the military's ability to fight and survive during cyberattacks, measure the state of cybersecurity, and explore and exploit new ideas in cyber warfare.

#### *Modeling and Simulation Grand Challenges*

The committee recognizes the value of modeling and simulation (M&S) to a wide range of activities within the Department of Defense. The committee believes that the Department could do more to harness the entrepreneurial and innovative spirit of industry, academia and the organic research and engineering resources of the Department to facilitate progress in the state of the art for M&S. The committee recognizes that the issuance of grand challenges have been effective in other areas, such as the Grand, Urban and Balloon Challenges of the Defense Advanced Research Projects Agency. The committee encourages the Department to develop and promulgate a set of M&S Grand Challenges for the research community that would support increased interagency coordination; improved efficiency and interoperability of specific M&S tools, as well as to replace, improve, or provide efficiencies to existing activities of the Department; reinvigorated use of simulation-based acquisition as an enterprise-wide strategy, including the use of modeling and simulation for performing analyses of alternatives for major defense acquisition programs; lowering the operations and support costs of the Department; and supporting risk mitigation activities.

#### *National Defense Education Program*

The budget request contained \$90.0 million in Program Element (PE) 61120D8Z for the national defense education program (NDEP).

The committee is aware that the Office of the Secretary of Defense supports some K-12 science, technology, engineering, and mathematics (STEM) educational activities through NDEP, as well as other programs to support undergraduate and postgraduate fel-

lowships. The committee recognizes STEM as a critical capability for the Department, not just in providing a pipeline of scientists and engineers for developing new capabilities, but also for acquisition professionals and policy-makers that should educate consumers when they make decisions about funding or pursuing new technologies. The committee further emphasizes the Department's growing need for a technically skilled workforce in all positions, particularly its enlisted personnel. A recent Council on Foreign Relations titled U.S. Education Reform and National Security, stated the U.S. "shortage of skilled human capital both inflates personnel costs and strains the military's ability to develop and deploy technologies that can deter sophisticated adversaries." It further states "Many U.S. generals caution that too many new enlistees cannot read training manuals for technologically sophisticated equipment. A former head of the Army's Training and Doctrine Command said that the lack of fully qualified young people was 'an imminent and menacing threat to our national security.'"

The committee notes that some research indicates that achieving certain math skills by the eighth grade is a critical determinant for success in STEM fields. For that reason, the committee believes that it is important for the Department to support K-12 STEM programs, as that supports an increased pipeline of qualified individuals that may pursue university degrees in STEM fields. The committee believes that K-12 STEM programs are a long-term investment for the Department, and should protect these investments even in a time of increased pressure on the Department's budget. The committee also believes that as the Department considers investments in K-12 STEM, it should ensure that these programs are tied to a comprehensive Department-wide strategy, and are thoroughly coordinated with other similar federal programs to avoid duplicative and conflicting efforts.

The committee recommends \$90.0 million, the full amount requested, in PE 61120D8Z for the national defense education program.

#### *National Defense University Research Program*

The committee is aware that the fundamental purpose of the National Defense University (NDU) is to provide rigorous joint professional military education to members of the U.S. Armed Forces, selected United States civilians, and international partners. NDU performs research in support of the national security strategy and national military strategy development needs of the Department, which the committee believes are key ingredients in preparing military and civilian leaders from the United States and other countries to evaluate national and international security challenges.

The committee notes that during the past two years NDU has undertaken a major realignment of its research activities to create opportunities for stronger leadership, new efficiencies, a more coherent research organization, a surge in world-class researchers, better cooperation between educators and researchers, and more effective outreach. The committee believes the alignment of research and education with practice is critical to developing the necessary leaders of the future. The committee encourages continuing support and stable funding for NDU's research activities to attract the world-class researchers and support the fundamental strategic and

technology policy research necessary to create the national security leaders of the future.

#### *Non-Lethal Weapons and Irregular Warfare*

The committee reaffirms its long-standing support for the rapid development and fielding of non-lethal weapons technologies and capabilities, which have broad applicability across a wide range of military operations. As an important adjunct to lethal force, these capabilities can be useful in implementing the military strategy highlighted in the Department of Defense's strategic guidance document most notably within the area of irregular warfare. The committee reiterates its belief that non-lethal directed energy technologies and systems show great promise and encourages the Department to more actively pursue these capabilities. The committee also believes the transition to the military services for deployment of technologically-mature non-lethal weapons programs must be accelerated. The committee encourages the Commandant of the Marine Corps, as Executive Agent for the Department's Non-Lethal Weapons Program, to facilitate military service integration of non-lethal weapons capabilities into the total force when appropriate and to ensure their effective use as appropriate in future contingency operations and irregular warfare.

#### *Phoenix Program*

The budget request included \$159.7 million in PE 63287E for space programs and technology. Of this amount, \$28.0 million was requested for the Phoenix program.

The committee is aware that the Defense Advanced Research Projects Agency is developing a program allowing the Department of Defense to work with existing satellite owners to leverage high-value, long-life components on existing satellites in geosynchronous orbit once they are no longer operational. Utilizing commercial capability to send small packaged systems into geosynchronous orbit, this program would allow for upgrading, fixing, repairing, and enhancing serviceable components. The committee is aware that there are a number of technical challenges, such as transportation and orbital maneuvering, robotic systems and integration, and extravehicular tool requirements. However, the committee believes that this program could revolutionize the utilization of space assets, if successful.

The committee recommends \$159.7 million, the full amount requested, in PE 63287E for space programs and technology, including \$28.0 million for the Phoenix program.

#### *Physical Barrier Protection*

The committee is aware that the expeditionary nature of military forces requires the capability to provide rapidly deployable physical security barriers that can provide ballistic and blast protection in austere environments. The committee recognizes that there are a number of commercially available products that provide some capability, but that the Department of Defense has also invested in developing and testing new physical security barrier systems with improved capability. The committee is concerned that the Department has not made adequate use of these improved systems, particularly in austere and restricted environments. The committee urges the

Department to take all practical measures to ensure that the most suitable physical protection systems are made available to the warfighter.

*Plan for Testing of the Missile Defense Systems Against Accidental or Unauthorized Launches Originating from the Russian Federation or the People's Republic of China*

The committee is aware that it is the current policy of the United States, as enacted in the National Missile Defense Act of 1999 (Public Law 106–38), that the United States “deploy as soon as is technologically possible an effective National Missile Defense system capable of defending the territory of the United States against limited ballistic missile attack whether accidental, unauthorized, or deliberate.”

The committee applauds the Commander, U.S. Northern Command for the diligence with which his command exercises against the many ballistic missile threats to the United States. The committee is, however, concerned that the threat of accidental or unauthorized launches has not received adequate attention.

The committee therefore directs the Commander, U.S. Northern Command to prepare and submit a plan to the congressional defense committees within 120 days after the date of the enactment of this Act for testing the national missile defense system against the unauthorized or accidental launch of a ballistic missile against the United States by states other than rogue regimes, specifically, the Islamic Republic of Iran or People's Democratic Republic of Korea, including an accidental or unauthorized launch of a missile by the Russian Federation or the People's Republic of China. The committee further directs the Commander to brief the congressional defense committees on the results of the plan.

*Potential Threats Posed by Open Source Publication of Medical Research*

The committee believes that advanced scientific research on extremely dangerous pathogens and toxins, such as Avian influenza virus, anthrax, and Ebola virus, is vital to the ongoing study of these agents' nature and how to safeguard military and civilian populations from them. The committee also understands that the complex nature of this research requires the scientific community to share its findings and research as widely as possible in a collaborative environment that includes public and private entities in order to maximize the potential for scientific advancements. However, the committee is concerned that in the hands of malignant actors, this research combined with readily available commercial, scientific, and medical technology, could be used to produce biological weapons for use against the very populations the research was intended to protect.

Therefore, the committee directs the Secretary of Defense to provide a briefing to the congressional defense committees within 180 days after the date of the enactment of this Act that describes the potential threats posed by the open publication of this advanced research, and steps that the Department could take to assist the interagency effort to mitigate these threats.

*Precision Tracking Space System*

The budget request contained \$297.4 million in PE 64883C for the Precision Tracking Space System (PTSS); the future years defense plans for fiscal year 2013 to 2017 includes \$1.530 billion.

The committee notes that the Government Accountability Office (GAO) has articulated concerns in its annual report on missile defense acquisition specifically about PTSS. The committee also notes that the GAO highlighted that the projected cost and size of the PTSS constellation is not yet known, making it impossible to conduct a true analysis of alternatives. Further, GAO noted that the acquisition strategy and timelines for the first PTSS satellites reaching orbit adds risk to the system, as do many of the technologies involved, many of which have never been integrated together. Additionally, the Strategic Forces Subcommittee was briefed recently by the National Academies on the final report of its study, mandated by section 232 of the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009, which recommended cancelling the PTSS altogether.

The committee is concerned that PTSS, which was intended to have most of the capabilities but much less of the cost than the Space Tracking and Surveillance System (STSS), may wind up having almost all of the cost of that system but much less of the capability. Further, the committee notes that there is no consensus as to what, exactly, PTSS would contribute to the defense of the United States, with some believing that PTSS offers great capability including tracking and the potential for discrimination capability, and others stating it is not-optimally designed for that mission and recommending other options for sensor coverage that may be more cost-effective. Lastly, the committee notes that systems with discrimination capability are the most useful to the defense of the United States.

The committee believes that an independent analysis of alternatives may conclude that there are less expensive and just as effective, if not more effective, means of providing added sensor coverage to the defense of the United States. Elsewhere in this title the committee has directed actions which could further inform that judgment.

The committee recommends \$50.0 million in PE 64883C, a decrease of \$247.4 million, for the Precision Tracking Space System.

*Production of Critical Materials for Protection Against Chemical, Biological, and Radiological Agents*

The committee recognizes the need for an adequate supply of materials to protect warfighters, first responders, and citizens from exposure to chemical, biological, and radiological agents. These materials are critical to assuring the mission effectiveness of U.S. forces to respond to domestic and international crises. Therefore, the committee encourages the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy, through the Defense Production Act—Title III program, to examine the industrial base capacity in this area and determine if additional sourcing is needed to ensure sufficient supply to meet current and projected needs.

*Rapid Innovation Fund*

The budget request contained no funding in PE 64775D8Z for the defense rapid innovation program, known as the Rapid Innovation Fund (RIF) program.

The Rapid Innovation Fund was created by Congress in the Ike Skelton National Defense Authorization Act for Fiscal Year 2011 (Public Law 111–383) in order to stimulate innovative technologies, reduce acquisition and lifecycle costs, address technical risks, improve the timeliness and thoroughness of test and evaluation outcomes, and rapidly insert such products directly in support of primarily major defense acquisition programs. The committee recognizes that the Department of Defense (DOD) has had some delays in receiving the funding, in part due to an extended continuing budget resolution at the beginning of fiscal year 2011. Despite those issues, the committee is aware that the DOD has made great progress in implementing a competitive process that has received over 3,500 proposals, and has been successful at attracting many new, non-traditional businesses to Department of Defense research. The committee continues to support the goals of this program, and encourages the Department to increase the reach and effectiveness of RIF. For example, the committee believes the Department should engage a broader spectrum of stakeholders in the requirements generation and evaluation process, such as the geographic and functional combatant commands, the Defense Information Systems Agency, and the Test Resource Management Center. The committee also recommends that future broad area announcements, and subsequent proposal evaluation, should assess business readiness, test and evaluation needs, and DOD technology insertion support to ensure best value proposals and successful project outcomes.

The committee recommends \$200.0 million, an increase of \$200.0 million, in PE 64775D8Z for the RIF program.

*Report by Secretary of Defense on SM–3 IIB Missile*

The committee believes the SM–3 IIB interceptor that is being developed by the Missile Defense Agency, should be capable of providing missile defense coverage to the continental United States from locations in Europe.

The Committee directs the Secretary to report within 90 days on how the SM–3 IIB interceptor in design and development will provide missile defense coverage to the continental United States from locations in Europe. Such report shall be unclassified, with a classified annex as necessary.

*Report on Fragility in the Missile Defense Industrial Base*

The committee is concerned about the impact of budget cuts on the missile defense industrial base, as it is concerned about the overall defense industrial base. In testimony before the Subcommittee on Strategic Forces on the fiscal year 2013 budget request for missile defense, the Director, Missile Defense Agency (MDA) stated: “If we have sequestration and the dramatic reduction in our programs, it will be most—hardest-felt in the supplier base. And it’s not only the availability of the supplies, as we were discussing before, it’s the manufacturing processes. And, a lot of these components that we use, and we use over 2,000, for example,

on a ground-based interceptor, those components themselves are built in a certain way that give it its reliability. And, the loss of the workforce in many of these cases I would say would be close to non-recoverable. Or, if it is recoverable, it's going to be a very painful process.”

The committee is also aware that there are certain components with only one or two suppliers remaining in that area of design and production. This is especially true for the producers of the Standard Missile 3 interceptor's Divert and Attitude Control System which guides the kill vehicle during the final phase of its intercept operations. The committee is deeply concerned about the absence of competition in the design and production of key missile defense technologies.

The committee therefore directs the Director, Missile Defense Agency to provide a report to the House Committee on Armed Services within 180 days that details the key components in major MDA missile defense systems and the extent to which there is a risk of relying on only a single supplier for those components. The report should include any specific efforts MDA has undertaken in the past 2 years to ensure competition in the industry supplier base for those components and any efforts the MDA plans to inform a strategy to deal with the risks of reliance on a single supplier for critical missile defense technologies in the years ahead. In addition, the committee urges the Missile Defense Agency to provide as part of the fiscal year 2014 budget request a plan on how it intends to implement the strategy.

#### *Report on Space-Based Interceptors*

The committee remains concerned that the full potential of ballistic missile technology is not being realized, particularly in space-based interceptor technology. The committee believes that the Secretary of Defense should pursue effective space-based interceptor technology to defend against long-range ballistic missile threats.

Therefore, the committee directs the Secretary of Defense to provide a report to the defense committees of Congress examining the technical and operational considerations associated with developing and operating a limited space-based interceptor capability. Within 120 days after the date of enactment of this Act, the report should include the following:

(A) the identification of the technical risks, gaps, and constraints associated with the development and operational of such a capability;

(B) an assessment of the maturity levels of various technologies needed to develop and operate such a capability;

(C) the key knowledge, research, and testing that would be needed for any nation to develop and operate an effective space-based interceptor capability; and

(D) the estimated effectiveness and cost of potential options for developing and operating such a capability, including their effectiveness in conjunction with existing and planned terrestrially-based missile defense systems

Furthermore, the committee believes that the Director of the Missile Defense Agency should establish a space-based interceptor program office to begin technology and engineering development activities. This program office should serve as the single-point of con-

tact vis-à-vis space-based interceptor technology. The committee directs the Director to seek funding for such an office in the fiscal year 2014 budget request for the Missile Defense Agency.

*Report on U.S. European Phased Adaptive Approach Spending and U.S. Export Controls*

The committee is concerned that U.S. funds may have been expended in a contract with a firm currently under investigation for violation of the U.S. International Trafficking in Arms Regulations. Therefore, the committee directs the Secretary of Defense to provide a report to the congressional defense committees by August 1, 2012, on whether any U.S. Department of Defense funds have been used, directly or indirectly, to obtain missile defense command and control systems from a contractor that is under investigation, per the most recent Blue Lantern report, for violation of U.S. International Trafficking in Arms Regulations. If U.S. funds were expended in a contract involving an entity currently under investigation for violating U.S. export control laws, the Secretary is directed to include in the report an explanation of why that company was allowed to receive such U.S. funds and when the U.S. funds were provided to the contractor that is under investigation.

*Risk Mitigation for Enterprise Resource Planning Systems*

The committee is aware of the challenges associated with implementing enterprise resource planning (ERP) systems. The committee is concerned that delays in implementing ERP systems places a significant financial burden on the Department of Defense and could jeopardize achievement of financial auditability goals. The Panel on Defense Financial Management and Auditability Reform also expressed concern that some ERPs do not function as intended, forcing the Department and the military services to rely on sustaining costly legacy systems and manual processes. Consequently, the committee believes that the Department should establish risk mitigation plans to address actual and potential deficiencies associated with the development, implementation, or utilization of its ERP systems that could affect the achievement of Financial Improvement and Audit Readiness (FIAR) goals.

Therefore, the committee directs the Secretary of Defense to submit a report to the congressional defense committees within 120 days after the date of the enactment of this Act that includes a risk mitigation plan for each ERP being developed by the Department of Defense and the military services, including how best to integrate the experience and expertise of the industry product provider at each stage of implementation and mitigation. At a minimum, each risk mitigation plan should:

- (1) Identify measures for resolving any such weaknesses or deficiencies;
  - (2) Assign responsibilities within the Department to implement such measures;
  - (3) Specify implementation steps for such measures;
  - (4) Provide timeframes for implementing such measures;
- and
- (5) Identify any alternative arrangements outside of the ERP environment that may be necessary for meeting FIAR objectives.

*Sea-Based X-Band Radar*

The budget request contained \$9.7 million in PE 63907C for the sea-based X-band (SBX) radar.

However, the committee is concerned that this request is not sufficient to maintain the deployment of the SBX to add sensor coverage to the defense of the United States for an extended period of time. For example, the committee is aware that the SBX radar has recently been deployed to support U.S. missile defense against People's Democratic Republic of Korea's pledged ballistic missile test, yet there is no funding source to support such a deployment. The committee is aware that the Missile Defense Agency is planning to pay for these and other SBX expenses by taking fiscal year 2012 appropriated funds and the request for fiscal year 2013.

The committee directs the Director, Missile Defense Agency to provide a report to the House Committee on Armed Services by June 15, 2012, on the costs of the deployment of the SBX radar to support U.S. operations vis-à-vis North Korea's April 2012 ballistic missile launch, and to provide an annual budget estimate for maintaining the SBX radar in a status such that it can be deployed in less than 14 days notice and for a period of at least 60 days per year. Elsewhere in this Act, the committee includes a provision that would require the Director, Missile Defense Agency to ensure a deployment capability for the SBX.

The committee recommends \$9.7 million, the full amount of requested, in PE 63907C for the SBX radar.

*SM-3 IB Missile*

The committee is concerned by the recent failure of the SM-3 IB missile's first test, which the committee approved \$565 million in procurement funding last year to procure 42 interceptors. The committee notes that the Missile Defense Agency (MDA) has planned three more flight tests in fiscal year 2012 to prove out the SM-3 IB missile, along with two additional flight tests in fiscal year 2013 prior to authorization to begin procurement activities.

The committee is very supportive of the more capable IB interceptor being available for the ballistic missile defense system upon the completion of appropriate testing. The committee is aware that the IB missile is a necessary component of the European Phased Adaptive Approach to missile defense, specifically phase II, and that other combatant commanders are planning to have this interceptor available for their missile defense requirements.

The committee is also aware that as the MDA is attempting to resolve problems with the IB, it is also attempting to complete development of the IIA missile and review design proposals of the IIB missile. The committee urges MDA to ensure adequate focus to the sequence of these development efforts, especially in a time of constrained budgets.

*SM-3 IIA Development*

The budget request contained \$399.3 million in PE 64881C for the SM-3 Block IIA co-development program.

The committee notes that the President's budget request is intended to maintain the U.S. commitment with Japan to meet the planned 2018 Initial Operating Capability (IOC) and the deployment of Phase III of the European Phased Adaptive Approach to

missile defense. The committee understands that procurement will commence in fiscal year 2017 with 12 rounds.

The committee recommends \$399.3 million, the full amount requested, in PE 64881 for the SM-3 Block IIA co-development program.

#### *SM-3 IIB Missile*

The budget request contained \$212.7 million in PE 63902C for the Standard Missile 3 (SM-3) IIB missile defense interceptor, and \$1913.3 million over the course of the Future Years Defense Plan (FYDP) for fiscal years 2013–2017. The committee supports the request for fiscal year 2013.

The committee notes that the Government Accountability Office expressed several concerns about the SM-3 IIB missile development path in its annual report on missile defense acquisition; the committee addresses these concerns in another section of this report.

The committee is aware that the Defense Science Board and the National Academies have all noted the technical challenges with the IIB missile in terms of how it will, or will not, be able to perform the mission for which it is intended. The committee is aware that one recent report has recommended the termination of Phase IV of the European Phased Adaptive Approach, which would include the deployment of the SM-3 IIB and the Precision Tracking Space System. The committee is not ready to support that recommendation at this time. The committee is however deeply concerned about the \$1.9 billion dollars programmed for the IIB missile in the FYDP. The committee considers that such investment may not be justified if the interceptor concept ultimately selected in fiscal year 2012 is only modestly more capable than the IIA missile.

#### *U.S. Missile Defense Data Sharing with Israel*

The committee supports the close ties between the missile defense programs of the State of Israel and the United States. The committee strongly believes such cooperation should continue. This cooperation should continue to include the sharing of missile defense data as is appropriate, to further U.S. national security goals, such as exists with the U.S. AN/TPY-2 radar currently deployed in Israel. Such data sharing, when appropriate, should also include data derived from the U.S. European Phased Adaptive Approach to missile defense and the North American Treaty Organization theater missile defense system, of which the EPAA is a U.S. contribution.

The committee is therefore concerned that senior NATO leadership had suggested data will not be shared with Israel, a key U.S. ally. The committee directs the Secretary to provide verification to the congressional defense committees and the House Committee on Foreign Affairs within 90 days after the date of the enactment of this Act that there are no international barriers to sharing with Israel any missile defense data derived from U.S. systems when the United States determines that the sharing of such data would further U.S. national security goals.

*U.S. Northern Command Report on Plan to Enhance Ground-Based Midcourse Defense Reliability and Discrimination and Change Shot Doctrine*

The committee has received testimony by the Director, Missile Defense Agency (MDA) and a classified briefing by the Institute for Defense Analyses on the Ground-based Midcourse Defense (GMD) system shot doctrine. The committee understands that MDA and the Department of Defense are planning for significant changes to the shot doctrine of the GMD system.

The committee is aware that the Commander, U.S. Northern Command is responsible for the GMD shot doctrine. The committee directs that the Commander, U.S. Northern Command to provide a report to the congressional defense committees by November 1, 2012, on the MDA shot doctrine strategy for the GMD, including the plan submitted in MDA's budget documents for fiscal year 2013 that details the Commander's views on the strategy. The report should also include the metrics concerning GMD reliability and discrimination that will be used when deciding whether and how to revise the shot doctrine for the GMD system.

*Use of Bone Samples in Research*

The committee is aware that the military depends on the research and study of collections of human bones to develop novel military body armor and helmets, amputation therapies, joint replacements, and remains-identification techniques, among other uses. The current collection most often utilized by the Department of Defense (DOD) often has a significant delay to conduct the necessary research. The collection also lacks sufficient diversity in size, age, ethnicity and other characteristics to reflect today's warfighters. Therefore, the committee encourages DOD to utilize additional publicly available, larger, and more demographically diverse bone collections when conducting its research and study.

*Vertical Lift Platform Technologies*

Two and a half years ago the Department of Defense Acquisition, Technology & Logistics leadership asked Industry to self-form into the "Vertical Lift Consortium" (VLC). The Department established an Other Transaction Agreement (OTA) with the VLC to more effectively define requirements, streamline development, flight demonstrate innovative Vertical Lift technologies and accelerate transition to the Warfighter at lower risk and cost. The VLC is an open and competitive forum that leverages all sectors of the Vertical Lift Community to encourage teaming of innovative small business and non-traditional contractors with major defense firms and academia.

The Committee supports the Department's engagement with the VLC to obtain input on future vertical lift technology requirements, methods and development strategies for next-generation vertical lift aircraft. The committee directs the Under Secretary of Defense for Acquisition, Technology, and Logistics to submit a report to the Congressional Defense Committees not later than March 15, 2013 providing the status of this initiative and, taking into consideration input from the VLC, recommend acquisition approaches for rapid and affordable flight demonstration of innovative Vertical Lift X-planes, including novel acquisition methods such as competitive prize awards that have been successfully applied in other fields.

*Weapons of Mass Destruction Defeat Technologies*

The committee notes that the Defense Threat Reduction Agency (DTRA) continues a strong partnership with each of the services and U.S. Special Operations Command to develop and field innovative weapons of mass destruction (WMD) defeat technologies and solutions that reduce, eliminate, and counter WMD threats. The committee supports the development of personnel protection equipment to include digital dosimeter radiation technologies and other lightweight portable detectors capable of identifying discrete quantities across the widest-spectrum of WMD threats for U.S. Special Operations Forces and general purpose forces. The committee is particularly interested in these technical and operational capabilities because the national intelligence community continues to assess credible threats posed by terrorist groups, states, and state-sponsored entities to acquire and weaponize WMD material for use against the United States and its allies. The committee therefore encourages DTRA to continue development of innovative and emerging detection and threat identification technologies and to ensure prompt transition of validated capabilities to address national security requirements.

## OPERATIONAL TEST AND EVALUATION, DEFENSE

## Overview

The budget request contained \$185.3 million for operational test and evaluation, Defense. The committee recommends \$220.3 million, an increase of \$35.0 million, in the requested amount for fiscal year 2013.

The committee recommendations for the fiscal year 2013 operational test and evaluation, Defense program are identified in division D of this Act.

## Items of Special Interest

*Testing of Information System Controls*

The committee is aware of the problems challenging many enterprise resource planning (ERP) systems. The committee's Panel on Defense Financial Management and Auditability Reform noted that a common problem for these programs was that testing for logical security controls, which should occur early in the developmental process, was typically prioritized after functionality testing, and tended only to occur at the end of the developmental process. The committee believes that the Department of Defense (DOD) should continue to subject its systems, whether legacy systems or ERPs, to information system controls testing. The committee also believes that the Department should place priority on this testing and ensure that sufficient numbers of appropriately skilled personnel exist within the test and evaluation community.

Therefore, the committee directs the Deputy Chief Management Officer for the Department of Defense, in coordination with the Director for Operational Test and Evaluation and the Deputy Assistant Secretary of Defense for Developmental Test and Evaluation, to provide a briefing to the Senate Committee on Armed Services and the House Committee on Armed Services within 120 days after the date of the enactment of this Act that assesses the information

system control testing needs for all ERPs being developed by the Department of Defense. The briefing should also determine whether appropriate workforce levels and corresponding skill sets exist within the Department's developmental and operational test communities, and how best to integrate the experience and expertise of the industry product provider during testing and implementation. The briefing should also describe what actions the Department is taking to address any identified shortfalls.

## 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—Next-Generation Long-Range Strike Bomber Aircraft Nuclear Certification Requirement

This section would require the Secretary of the Air Force to make certain that the new long-range strike bomber will be capable of using strategic weapons by the date it receives declaration of initial operational capability (IOC), and nuclear certified to use strategic weapons no later than two years after declaration of IOC.

#### Section 212—Unmanned Combat Air System

This section would require the Secretary of the Navy to conduct additional risk reduction activities related to the technology development of the follow-on Unmanned Carrier-launched Surveillance and Strike system.

#### Section 213—Extension of Limitation on Availability of Funds for Unmanned Carrier-Launched Surveillance and Strike System Program

This section would amend section 213 of the National Defense Authorization Act for Fiscal Year 2012 (Public Law 112-81) and would preclude the Secretary of the Navy from obligating 25 percent of appropriated funds until the reporting and certification requirements of section 213 are met. This section would also prevent the Secretary of the Navy from “down-selecting” to less than two prime contract competitors prior to the critical design review milestone for the program.

#### Section 214—Limitation on availability of funds for future manned ground moving target indicator capability of the Air Force

This section would restrict the obligation and expenditure of Air Force research, development, test and evaluation funds for any activity, including pre-milestone A activities, to initiate a new start acquisition program to provide the Air Force with a manned ground moving target capability or manned dismount moving tar-

get capability until a period of 90 days has elapsed following the date on which the Secretary of the Air Force submits a report on the plan for manned future ground moving target and manned dismount moving target indicator capabilities of the Air Force. The report required in this section would include: the plan to maintain onboard command and control capability that is equal or better than such capability provided by the E-8C joint surveillance target attack radar program; each analysis of alternatives completed during fiscal year 2012 regarding future manned ground moving target indicator capability or manned dismount moving target indicator capability; an analysis of each alternative considered, including cost and a description of how such programs would affect the potential growth of future manned ground moving target indicator capability or manned dismount moving target indicator capability; a description of potential operational and sustainment cost savings realized by the Air Force using a platform that is derived from a commercial aircraft and in operation by the Department of Defense as of the date of the report; the plan by the Secretary of Defense to retire or replace E-8C joint surveillance target attack radar aircraft; and any other matter the Secretary considers appropriate. This section would permit the Secretary to waive the restriction on the obligation and expenditure of funds for this purpose if the Secretary determines such a waiver is required to meet an urgent operational need or other emergency contingency requirement directly related to ongoing combat operations, and notifies the congressional defense committees of such determination.

#### Section 215—Limitation on Availability of Funds for Milestone A Activities for the MQ-18 Unmanned Aircraft System

This section would limit the use of funds for milestone A activities for the MQ-18 Medium Range Multi-Purpose Vertical Take-off and Landing Unmanned Aircraft System (UAS) until the Chairman of the Joint Requirements Oversight Council certifies that the MQ-18 UAS is required to meet a capability in the Department of Defense manned and unmanned medium-altitude intelligence, surveillance, and reconnaissance force structure and that an existing UAS cannot meet the required capability or be modified to meet the required capability. This section would also define milestone A as the distribution of request for proposals, selection of technology demonstration contractors, and/or technology development.

#### Section 216—Vertical Lift Platform Technology Demonstrations

This section would authorize a program to develop and flight-demonstrate vertical lift technologies.

### SUBTITLE C—MISSILE DEFENSE PROGRAMS

#### Section 221—Procurement of AN/TPY-2 Radars

This section would require that the Secretary of Defense acquire two additional AN/TPY-2 radar radars, one of which is requested in the fiscal year 2013 budget request and one additional radar in fiscal year 2013. The committee is aware there are significant budget efficiencies to procuring two radars as opposed to one. Therefore, the committee recommend the full amount of the budget

request of \$217.2 million in fiscal year 2013 for PE 28866C, Procurement, Defense Wide, Missile Defense Agency, and it recommends an additional \$170.0 million for the procurement of the second radar in fiscal year 2013. The committee is concerned that the fiscal year 2013 budget submission and the associated Future Years Defense Program recommend reducing the acquisition of the AN/TPY-2 radar by 6 units to only 12 radar units.

The committee is not aware of any decrease in combatant commander requirements for these radars, and, in fact, it is concerned that this reduction in acquisition may force combatant commanders to take undesirable risks in trading off deployments of these radars, which are key to regional and homeland missile defense. The committee is concerned that the Department and the Missile Defense Agency (MDA) is relying too heavily on the MDA's Precision Tracking Space System concept, a concept which the committee expresses its concerns elsewhere in this report.

The committee also believes that it may be possible to better utilize the current TPY-2 system. To that end, this section would require the Secretary of Defense to conduct a study the utility, costs, and risks of mounting the TPY-2 radar on a rotational table allowing for it to rapidly change direction of the radar array.

#### Section 222—Development of Advanced Kill Vehicle

The section would require that the Director, Missile Defense Agency submit a plan within 180 days after the date of the enactment of the Act to ensure that the kill vehicle for the Next Generation Aegis Missile can be adapted to also serve as an improved kill vehicle for the Ground-based Midcourse Defense System. The committee also believes that for this purpose, the Director should provide a description of the technology of and concept behind applying the former Multiple Kill Vehicle proposal to the Next Generation Kill Vehicle, which was terminated in the budget request for fiscal year 2010.

The committee believes this plan is consistent with the recommendation of the National Academies' Assessment of Concepts and Systems for U.S. Boost-Phase Missile Defense in Comparison to Other Alternatives, which was conducted pursuant to the Duncan Hunter National Defense Authorization Act for Fiscal Year 2009 (Public Law 110-417).

#### Section 223—Missile Defense Site on the East Coast

This section would require the Secretary of Defense to conduct an environmental impact statement by December 31, 2013, on possible locations on the East Coast of the United States for the deployment of a missile defense site.

This section would also require the Director, Missile Defense Agency to develop a plan for the deployment of an East Coast site to be operational not later than the end of 2015; the plan would evaluate the use of two-stage and three-stage ground-based interceptors, as well as the SM-3 block IA, block IB, and later blocks of the SM-3 missile. This section would require the plan to be included in the fiscal year 2014 budget submission, but it would also authorize \$100.0 million in PE 63882C in fiscal year 2013 to be

available 30 days after the plan is presented to the congressional defense committees.

The section would also add criteria for the selection of the location of the missile defense site on the East Coast of the United States.

The committee is aware that a cost effective missile defense site located on the East Coast of the United States could have advantages for the defense of the United States from ballistic missiles launched from the Middle East. The committee is also aware that several reviews, including studies by the Commander, U.S. Northern Command in 2007–08 (which do not reflect current command recommendations in view of the 2010 Ballistic Missile Defense Review), the Institute for Defense Analyses, and the National Academies have all examined the potential contribution of an East Coast missile defense site, and certain of these studies have recommended that work begin on the development and deployment of such a site. The committee encourages the Department to provide to the defense committees an interim analysis on feasibility and cost no later than February 1, 2013.

#### Section 224—Ground-based Midcourse Defense System

The section would authorize a total of \$1.26 billion for PE 63882C for fiscal year 2013.

This section would require the Director of the Missile Defense Agency to begin the upgrade of the six silos in Missile Field 1, which the fiscal year 2013 budget request recommends be shut down and moved to a near-mothball status, and complete it so that it is in operationally ready status within 3 years; this recommendation is consistent with the Administration’s policy to be “well hedged” against the possibility that new threats may emerge. This section would also require the funds provided in this section be spent to complete the refurbishment of the CE1 GMD interceptor fleet to improve reliability.

#### Section 225—Ground-based Midcourse Defense Interceptor Test

The section would require the Director, Missile Defense Agency (MDA) to undertake an intercept test, using an intercontinental ballistic missile (ICBM) class target, of the ground-based midcourse defense system (GMD) using a CE1 interceptor, which has been successfully tested three out of three times, though not against an intercontinental ballistic missile target, by the end of calendar year 2013. The committee is concerned that under current MDA plans, the GMD system won’t be tested against an ICBM until the fourth quarter of 2015. The committee believes that the pace of the growth of ICBM threats to the United States requires the GMD system be tested sooner than current MDA plans.

#### Section 226—Deployment of SM–3 IIB Interceptors on Land and Sea

This section would express the sense of the Congress that the Standard Missile 3 (SM–3) IIB missile defense interceptors should be deployed at initial deployment, currently planned for 2020, in a land-based and sea-based mode. This provision would also require the Secretary of Defense to provide a report within 180 days after

the date of the enactment of this Act on the implications for the force structure of the Navy if the SM-3 IIB cannot fit in the standard Vertical Launching System configuration for the Aegis BMD system, including the effect on Navy ship deployments, cost, and overall magazine depth to respond to missile raids. This section would also require that the report include an explanation if the interceptors cannot be deployed in a sea-based mode at initial deployment, including cost and force structure requirements, related to the use of the IIB missile for the defense of the United States from threats originating in the Pacific region.

#### Section 227—Iron Dome Short-Range Rocket Defense Program

This section would authorize \$680.0 million for the Iron Dome system in fiscal years 2012–15 in PE 63913C for procurement of additional batteries and interceptors, and for operations and sustainment expenses. This section would also require the Director, Missile Defense Agency to establish within MDA a program office for cooperative missile defense efforts on the Iron Dome system to ensure long-term cooperation on this program.

The committee is aware that National Defense Authorization Act for Fiscal Year 2011 (Public Law 111–383) included \$205.0 million for the Iron Dome short-range rocket defense system for the State of Israel. The committee notes that the Iron Dome system has proven very effective at defeating threat rockets launched at protected targets. The committee also notes that if the full \$680.0 million is used on the program, the total U.S. taxpayer investment in this system will amount to nearly \$900.0 million since fiscal year 2011, yet the United States has no rights to the technology involved. The committee believes the Director should ensure, prior to disbursing the authorized \$680 million for Iron Dome, that the United States has appropriate rights to this technology for United States defense purposes, subject to an agreement with the Israeli Missile Defense Organization, and in a manner consistent with prior U.S.-Israeli missile defense cooperation on the Arrow and David's Sling suite of systems. The committee also believes that the Director should explore any opportunity to enter into co-production of the Iron Dome system with Israel, in light of the significant U.S. investment in this system.

#### Section 228—Sea-Based X-Band Radar

This section would require the Director, Missile Defense Agency to ensure that the sea-based X-band (SBX) radar is maintained in a status such that the radar may be deployed in less than 14 days and for at least 60 days each year.

#### Section 229—Prohibition on the Use of Funds for the MEADS Program

This section would prohibit the Department from obligating any funding on the Medium Extended Air Defense System (MEADS) program.

The committee notes that in the conference report (H. Rept. 112–329) accompanying the National Defense Authorization Act for Fiscal Year 2012, the conferees limited the availability of more than 25 percent of fiscal year 2012 funds for MEADS until the Sec-

retary of Defense submits a plan to use such funds as final obligations under the MEADS program for either: (1) implementing a restructured MEADS program of reduced scope; or (2) contract termination liability costs with respect to the contracts covering the program. The committee believes there should have been no confusion regarding the meaning of “final obligations.”

The committee further finds that the Department of Defense has not yet submitted the reports required by section 235 of the National Defense Authorization Act for Fiscal Year 2012 (Public Law 112–81). The committee believes this report, when submitted, will offer useful direction for the Patriot Improvement Program, which is referenced elsewhere in this report.

Additionally, the Government Accountability Office has reported to the Senate Committee on Armed Services and the House Committee on Armed Services in its recent selected acquisition report that there may in fact be continuing MEADS expenses for the United States for several years beyond fiscal year 2013, which would be inconsistent with budget briefings provided to the committee by the Department.

The committee understands that the Department of Defense is now engaging, at the senior most levels, with representatives of Germany and Italy concerning this program. The committee believes such senior level attention earlier in the course of this program might have saved the taxpayers significant expenditure of dollars.

The committee further understands from the Department that the Federal Republic of Germany and the Italian Republic have made clear they will not work with the United States to further adjust the terms of the MEADS program, believing they have a deal with the United States and having made their required contributions to the program. The committee urges the Department to remind the representatives of Germany and Italy that only Congress can commit the United States to the expenditure of taxpayer funds.

#### Section 230—Limitation on Availability of Funds for Phased, Adaptive Approach to Missile Defense in Europe

This section would require the Secretary of Defense and the Secretary of State to jointly submit a plan to the congressional defense committees on cost-sharing with the North Atlantic Treaty Organization (NATO) the expenses of the fixed European Phased Adaptive Approach (EPAA) assets, including the Aegis Ashore sites and the forward-deployed AN/TPY–2 radar. The committee believes other expenses should also be included, though it notes it has not received a complete explanation from the Department of all of the U.S. capabilities that will be available to support the EPAA. This section would also require the Secretary of Defense to submit a NATO pre-financing request for the expenses of this missile defense equipment, as is required for EPAA military construction expenses elsewhere in this bill. This section would limit the obligation or expenditure of 25 percent of the costs of the specified EPAA expenses for missile defense equipment until NATO responds to the U.S. pre-financing request. Mindful of the highly ambitious timelines for deployment of the EPAA and the rising long-range missile threat from the Islamic Republic of Iran, this section would

provide the President a waiver if he determines the use of that authority is vital to the national security of the United States.

The committee is aware that the Administration decided that the European Phased Adaptive Approach to missile defense should be a U.S. contribution to NATO as announced at the Lisbon Summit in November 2010. The committee is concerned that when this commitment was made, there was no clear understanding of the cost of the EPAA deployment; the committee notes that there has not yet been a detailed assessment of the cost of the deployment. The committee understands that the Cost Assessment and Program Evaluation office in the Office of the Secretary of Defense is now attempting to provide a comprehensive and detailed cost estimate for the EPAA. The committee notes that in a letter in February of this year, Acting Under Secretary of Defense, stated that a briefing on the interim findings of the cost estimate would be provided in March of this year to support the committee's oversight activities; that briefing was not provided.

The committee is aware that some of the command and control arrangements are being sorted out now in anticipation of the NATO summit in May of 2012 in Chicago. As noted elsewhere in this report, the committee expects to be briefed on these arrangements, which should assist the committee in better understanding the extent to which the EPAA is providing for the missile defense of Europe and the missile defense of the United States and its interests, including its deployed forces. Such understanding is key to the appropriate cost-sharing of the EPAA.

The committee also notes significant budget challenges to the United States missile defense program in view of the budget cuts under the Budget Control Act (Public Law 112-25) and the President's budget requests since his fiscal year 2010 budget request. The committee is aware that the budget request for the Missile Defense Agency for fiscal year 2013 is approximately \$400.0 million less than the request for fiscal year 2012, and the projected requests between fiscal year 2013-16 are approximately \$3.6 billion less in the fiscal year 2013 Future Years Defense Program (FYDP) than they were in the fiscal year 2012 FYDP.

The committee notes that such reductions have had an impact on the budgets for the national missile defense programs, including the ground-based midcourse defense program, the sea-based X-band radar system, and forward deployed AN/TPY-2 radars, which can have significant capability for homeland and regional missile defense. The committee also notes significant reductions in systems like the Terminal High Altitude Area Defense system. The committee notes, however, that plans for the EPAA remain unchanged and, in many cases, the budget requests have been increased by the fiscal year 2013 budget request and FYDP. The committee recommends NATO provide financial support for the U.S. contribution to Europe's missile defense given the budget environment.

#### Section 231—Limitation on Availability of Funds for the Precision Tracking Space System

This section would limit the obligation or expenditure of funds authorized to be appropriated or otherwise made available for the Precision Tracking Space System (PTSS) until a contract is signed for an analysis of alternatives by a Federally Funded Research and

Development Corporation (FFRDC), which has not been involved with the PTSS program to date, and which appoints a panel of independent study leaders. This provision would also require that the terms of reference for the study should be shared with the congressional defense committees when the AOA is commenced. This section would also limit the use of funds only to PTSS technology development activities until the FFRDC completes the analysis and 60 days have lapsed since the report has been provided to the congressional defense committees.

This section would require that the analysis of alternatives examine the possible lowest cost sensor option, i.e., land-, air-, space-based, or some combination of them, with respect to acquisition and operations and sustainment costs over the next 10 years, and for improving homeland missile defense, including adding discrimination capability for the Ground-based Midcourse Defense System. This section would also require the FFRDC to examine what overhead persistent imagery data or other data is already available that is not being used for missile defense and how the exploitation of that data could aid the missile defense mission. The FFRDC would also be required to study the plans for integrating PTSS into the ballistic missile defense system and evaluate the concept of operations for its use in the system.

The committee expects the analysis conducted by the FFRDC will be based on a clear articulation by the Missile Defense Agency (MDA) of the following: the ground-based sensors that will be required to be maintained to aid the PTSS constellation; the number of satellites planned to be procured for a first constellation (including projected lifetime of satellites in the first constellation) and a replenishment constellation; technological and acquisition risks of the PTSS, and an evaluation of technological capability differences between PTSS and the STSS; and, the costs of the system including the projected acquisition, integration, operations, and sustainment costs, including for launch services. The committee expects all cost data used by the FFRDC will be fully validated by the Department of Defense Cost Assessment and Program Evaluation office, and will be compared with other missile defense sensor systems. This section would also require that the AOA include an examination of the space situational awareness capabilities of the PTSS, including requirements and cost-sharing between MDA and the Air Force based on a memorandum to be negotiated between the two agencies, which should be shared with the congressional defense committees.

The committee recommends this provision based on concerns raised by the Government Accountability Office (GAO) that a true analysis of alternatives (AOA) for PTSS was never conducted. In addition, in testimony before the Subcommittee on Strategic Forces in March 2012 on the missile defense budget request for fiscal year 2013, the Director, Missile Defense Agency stated that "the capability for a missile defense system like this will spend most of its time doing functions other than missile defense." The committee believes that a system that will spend most of its time doing a mission other than homeland missile defense, in this case, the space situational awareness mission, should be more directly designed for its primary mission, and that the MDA should not be entirely responsible for the cost of this system. In the event that the analysis

of alternatives the committee has recommended concurs with the PTSS as the optimal way ahead for the homeland missile defense mission, the committee believes this provision is vital to ensure the responsible expenditure of taxpayer dollars.

Lastly, the committee is aware that the Cost Assessment and Program Evaluation office of the Office of the Secretary of Defense is still conducting a review of the cost of the PTSS. The committee believes that it should have a more fulsome understanding of the costs and tradeoffs of this system before it too heavily invests scarce missile defense dollars in this system.

#### Section 232—Plan to Improve Discrimination and Kill Assessment Capability of Ballistic Missile Defense Systems

The committee recommends a provision that would require the Director, Missile Defense Agency to develop a plan, to be submitted to the congressional defense committees not later than December 31, 2012, and include the funding for such plan in his fiscal year 2014 budget request, for an improved discrimination and kill assessment capability of the Ballistic Missile Defense Systems, including, specifically, the Ground-based Midcourse Defense system.

#### Section 233—Plan to Increase Rate of Flight Tests of Ground-Based Midcourse Defense System

This section would require the Director, Missile Defense Agency to develop a plan to increase the rate of flight tests and ground tests of the Ground-based Midcourse Defense system. The plan shall ensure that there are at least three flight tests every 2 years, unless the Director, Missile Defense Agency provides written certification and an analysis to the congressional defense committees that it is not feasible or cost-effective. This section would require the Director include funding for such plan in the fiscal year 2014 budget request.

#### Section 234—Report on Regional Missile Defense Architectures

This section would require that the Secretary of Defense, in coordination with the Chairman of the Joint Chiefs of Staff, shall provide a report to the congressional defense committees not later than 90 days after the date of the enactment of this Act, describing: (1) the planned regional missile defense architectures, including the force structure and inventory requirements derived from these planned architectures, and their purpose and cost; and, (2) the comprehensive force management process, and the capability, deployment, and resource outcomes that have been determined by this process.

The National Defense Authorization Act for Fiscal Year 2010 (Public Law 111–84) required the preparation of a report on regional missile defense plans in order to better understand the force structure and budgetary implications of the plan articulated in the Ballistic Missile Defense Review of 2010 to create regional missile defense architectures beyond the European Phased Adaptive Approach in East Asia and the Middle East. However, the committee can find no record of the receipt of this required report.

Section 235—Use of Funds for Conventional Prompt Global Strike Program

This section would require the Secretary of Defense to ensure that out of funds authorized to be appropriated for ground-testing activities of the conventional prompt global strike program, they only be expended using competitive solicitation procedures to involve industry as well as government partners.

Section 236—Transfer of Aegis Weapon System Equipment to Missile Defense Agency

This section would authorize the Secretary of the Navy, in accordance with section 230 of this Act, to transfer to the Director of the Missile Defense Agency, Aegis weapon system equipment for use in the Aegis Ashore Site in Romania, with certain authorities to preserve shipbuilding schedules. The Director of the Missile Defense Agency would be authorized to transfer Aegis weapon system equipment for installation in a shore-based Aegis weapon system to the Secretary of the Navy for use in the DDG-51 Destroyer program.

SUBTITLE D—REPORTS

Section 241—Study on Electronic Warfare Capabilities of the Marine Corps

This section would require that the Commandant of the Marine Corps to conduct a study on the future capabilities of the Marine Corps with respect to electronic warfare, and to submit a report to the congressional defense committees not later than 90 days after the date of the enactment of this Act which would include: a detailed plan for EA-6B Prowler aircraft squadrons; a solution for the replacement of the EA-6B aircraft; concepts of operation for future air-ground task force electronic warfare capabilities of the Marine Corps; and any other issues that the Commandant determines to be appropriate.

Section 242—National Research Council Review of Defense Science and Technical Graduate Education Needs

This section would require the Secretary of Defense to enter into an arrangement with the National Research Council to review Department of Defense specialized degree-granting graduate programs in engineering, applied sciences, and management.

Section 243—Report on Three-Dimensional Integrated Circuit Manufacturing Capabilities

This section would require the Secretary of Defense to provide a comprehensive assessment regarding three-dimensional integrated circuits manufacturing capacity to serve the U.S. military and other national security interests, and to provide a report on the findings to the Senate Committee on Armed Services and the House Committee on Armed Services within 90 days after the date of the enactment of this Act.

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

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

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

| Line  | Program<br>Element | Item   | FY 2013<br>Request | House<br>Change | House<br>Authorized |
|---|--------------------|--|--------------------|-----------------|---------------------|
| <b>RESEARCH, DEVELOPMENT, TEST &amp; EVAL, ARMY</b> |                    |  |                    |                 |                     |
| <b>BASIC RESEARCH</b>                               |                    |  |                    |                 |                     |
| 1   | 0601101A           | IN-HOUSE LABORATORY INDEPENDENT RESEARCH .....               | 20,860             |                 | 20,860              |
| 2   | 0601102A           | DEFENSE RESEARCH SCIENCES .....                              | 219,180            |                 | 219,180             |
| 3   | 0601103A           | UNIVERSITY RESEARCH INITIATIVES .....                        | 80,986             |                 | 80,986              |
| 4   | 0601104A           | UNIVERSITY AND INDUSTRY RESEARCH CENTERS .....               | 123,045            |                 | 123,045             |
|   |                    | <b>SUBTOTAL BASIC RESEARCH .....</b>                         | <b>444,071</b>     |                 | <b>444,071</b>      |
| <b>APPLIED RESEARCH</b>                             |                    |  |                    |                 |                     |
| 5   | 0602105A           | MATERIALS TECHNOLOGY .....                                   | 29,041             | 10,250          | 39,291              |
|   |                    | Advanced coating technologies for corrosion mitigation ..... |                    | [10,250]        |                     |
| 6   | 0602120A           | SENSORS AND ELECTRONIC SURVIVABILITY .....                   | 45,260             |                 | 45,260              |
| 7   | 0602122A           | TRACTOR HIP .....  | 22,439             |                 | 22,439              |
| 8   | 0602211A           | AVIATION TECHNOLOGY .....                                    | 51,607             |                 | 51,607              |
| 9   | 0602270A           | ELECTRONIC WARFARE TECHNOLOGY .....                          | 15,068             |                 | 15,068              |
| 10  | 0602303A           | MISSILE TECHNOLOGY .....                                     | 49,383             |                 | 49,383              |
| 11  | 0602307A           | ADVANCED WEAPONS TECHNOLOGY .....                            | 25,999             |                 | 25,999              |
| 12  | 0602308A           | ADVANCED CONCEPTS AND SIMULATION .....                       | 23,507             |                 | 23,507              |

|    |          |  |                |                |
|----|----------|--|----------------|----------------|
| 13 | 0602601A | COMBAT VEHICLE AND AUTOMOTIVE TECHNOLOGY .....           | 69,062         | 69,062         |
| 14 | 0602618A | BALLISTICS TECHNOLOGY .....                              | 60,823         | 60,823         |
| 15 | 0602622A | CHEMICAL, SMOKE AND EQUIPMENT DEFEATING TECHNOLOGY ..... | 4,465          | 4,465          |
| 16 | 0602623A | JOINT SERVICE SMALL ARMS PROGRAM .....                   | 7,169          | 7,169          |
| 17 | 0602624A | WEAPONS AND MUNITIONS TECHNOLOGY .....                   | 35,218         | 35,218         |
| 18 | 0602705A | ELECTRONICS AND ELECTRONIC DEVICES .....                 | 60,300         | 60,300         |
| 19 | 0602709A | NIGHT VISION TECHNOLOGY .....                            | 53,244         | 53,244         |
| 20 | 0602712A | COUNTERMINE SYSTEMS .....                                | 18,850         | 18,850         |
| 21 | 0602716A | HUMAN FACTORS ENGINEERING TECHNOLOGY .....               | 19,872         | 19,872         |
| 22 | 0602720A | ENVIRONMENTAL QUALITY TECHNOLOGY .....                   | 20,095         | 20,095         |
| 23 | 0602782A | COMMAND, CONTROL, COMMUNICATIONS TECHNOLOGY .....        | 28,852         | 28,852         |
| 24 | 0602783A | COMPUTER AND SOFTWARE TECHNOLOGY .....                   | 9,830          | 9,830          |
| 25 | 0602784A | MILITARY ENGINEERING TECHNOLOGY .....                    | 70,693         | 70,693         |
| 26 | 0602785A | MANPOWER/PERSONNEL/TRAINING TECHNOLOGY .....             | 17,781         | 17,781         |
| 27 | 0602786A | WARFIGHTER TECHNOLOGY .....                              | 28,281         | 28,281         |
| 28 | 0602787A | MEDICAL TECHNOLOGY .....                                 | 107,891        | 107,891        |
|    |          | <b>SUBTOTAL APPLIED RESEARCH .....</b>                   | <b>874,730</b> | <b>884,980</b> |

|    |          |  |               |                |
|----|----------|--|---------------|----------------|
| 29 | 0603001A | <b>ADVANCED TECHNOLOGY DEVELOPMENT</b>                     | 39,359        | 39,359         |
| 30 | 0603002A | WARFIGHTER ADVANCED TECHNOLOGY .....                       | 69,580        | 69,580         |
| 31 | 0603003A | MEDICAL ADVANCED TECHNOLOGY .....                          | 64,215        | 64,215         |
| 32 | 0603004A | AVIATION ADVANCED TECHNOLOGY .....                         | 67,613        | 67,613         |
| 33 | 0603005A | WEAPONS AND MUNITIONS ADVANCED TECHNOLOGY .....            | 104,359       | 104,359        |
| 34 | 0603006A | COMBAT VEHICLE AND AUTOMOTIVE ADVANCED TECHNOLOGY .....    | 4,157         | 4,157          |
| 35 | 0603007A | COMMAND, CONTROL, COMMUNICATIONS ADVANCED TECHNOLOGY ..... | 9,856         | 9,856          |
| 36 | 0603008A | MANPOWER, PERSONNEL AND TRAINING ADVANCED TECHNOLOGY ..... | 50,661        | 50,661         |
| 37 | 0603009A | ELECTRONIC WARFARE ADVANCED TECHNOLOGY .....               | 9,126         | 9,126          |
| 38 | 0603015A | TRACTOR HIKE .....   | 17,257        | 17,257         |
| 39 | 0603020A | NEXT GENERATION TRAINING & SIMULATION SYSTEMS .....        | 9,925         | 9,925          |
| 40 | 0603105A | TRACTOR ROSE .....   | 6,984         | 6,984          |
| 41 | 0603125A | MILITARY HIV RESEARCH .....                                | 9,716         | 9,716          |
|    |          | COMBATING TERRORISM—TECHNOLOGY DEVELOPMENT .....           |               |                |
|    |          | <b>SUBTOTAL APPLIED RESEARCH .....</b>                     | <b>10,250</b> | <b>884,980</b> |

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

| Line | Program Element | Item   | FY 2013 Request | House Change | House Authorized |
|------|-----------------|--|-----------------|--------------|------------------|
| 42   | 0603130A        | TRACTOR MAIL .....   | 3,487           |              | 3,487            |
| 43   | 0603131A        | TRACTOR EGGS .....   | 2,323           |              | 2,323            |
| 44   | 0603270A        | ELECTRONIC WARFARE TECHNOLOGY .....                            | 21,683          |              | 21,683           |
| 45   | 0603313A        | MISSILE AND ROCKET ADVANCED TECHNOLOGY .....                   | 71,111          |              | 71,111           |
| 46   | 0603322A        | TRACTOR CAGE .....   | 10,902          |              | 10,902           |
| 47   | 0603461A        | HIGH PERFORMANCE COMPUTING MODERNIZATION PROGRAM .....         | 180,582         |              | 180,582          |
| 48   | 0603606A        | LANDMINE WARFARE AND BARRIER ADVANCED TECHNOLOGY .....         | 27,204          |              | 27,204           |
| 49   | 0603607A        | JOINT SERVICE SMALL ARMS PROGRAM .....                         | 6,095           |              | 6,095            |
| 50   | 0603710A        | NIGHT VISION ADVANCED TECHNOLOGY .....                         | 37,217          |              | 37,217           |
| 51   | 0603728A        | ENVIRONMENTAL QUALITY TECHNOLOGY DEMONSTRATIONS .....          | 13,626          |              | 13,626           |
| 52   | 0603734A        | MILITARY ENGINEERING ADVANCED TECHNOLOGY .....                 | 28,458          |              | 28,458           |
| 53   | 0603772A        | ADVANCED TACTICAL COMPUTER SCIENCE AND SENSOR TECHNOLOGY ..... | 25,226          |              | 25,226           |
|      |                 | <b>SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT .....</b>          | <b>890,722</b>  |              | <b>890,722</b>   |
|      |                 | <b>ADVANCED COMPONENT DEVELOPMENT &amp; PROTOTYPES</b>         |                 |              |                  |
| 54   | 0603305A        | ARMY MISSILE DEFENSE SYSTEMS INTEGRATION .....                 | 14,505          |              | 14,505           |
| 55   | 0603308A        | ARMY SPACE SYSTEMS INTEGRATION .....                           | 9,876           |              | 9,876            |
| 56   | 0603619A        | LANDMINE WARFARE AND BARRIER—ADV DEV .....                     | 5,054           |              | 5,054            |
| 57   | 0603627A        | SMOKE, OBSCURANT AND TARGET DEFEATING SYS—ADV DEV .....        | 2,725           |              | 2,725            |
| 58   | 0603639A        | TANK AND MEDIUM CALIBER AMMUNITION .....                       | 30,560          |              | 30,560           |
| 59   | 0603653A        | ADVANCED TANK ARMAMENT SYSTEM (ATAS) .....                     | 14,347          |              | 14,347           |
| 60   | 0603747A        | SOLDIER SUPPORT AND SURVIVABILITY .....                        | 10,073          |              | 10,073           |
| 61   | 0603766A        | TACTICAL ELECTRONIC SURVEILLANCE SYSTEM—ADV DEV .....          | 8,660           |              | 8,660            |
| 62   | 0603774A        | NIGHT VISION SYSTEMS ADVANCED DEVELOPMENT .....                | 10,715          |              | 10,715           |
| 63   | 0603779A        | ENVIRONMENTAL QUALITY TECHNOLOGY—DE/MVAL .....                 | 4,631           |              | 4,631            |
| 64   | 0603782A        | WARFIGHTER INFORMATION NETWORK-TACTICAL—DE/MVAL .....          | 278,018         |              | 278,018          |
| 65   | 0603790A        | NATO RESEARCH AND DEVELOPMENT .....                            | 4,961           |              | 4,961            |

|    |          |   |                |                |
|----|----------|---|----------------|----------------|
| 66 | 0603801A | AVIATION—ADV DEV .....  | 8,602          | 8,602          |
| 67 | 0603804A | LOGISTICS AND ENGINEER EQUIPMENT—ADV DEV .....                          | 14,605         | 14,605         |
| 68 | 0603805A | COMBAT SERVICE SUPPORT CONTROL SYSTEM EVALUATION AND ANALYSIS .....     | 5,054          | 5,054          |
| 69 | 0603807A | MEDICAL SYSTEMS—ADV DEV .....   | 24,384         | 24,384         |
| 70 | 0603827A | SOLDIER SYSTEMS—ADVANCED DEVELOPMENT .....                              | 32,050         | 32,050         |
| 71 | 0603850A | INTEGRATED BROADCAST SERVICE .....                                      | 96             | 96             |
| 72 | 0604115A | TECHNOLOGY MATURATION INITIATIVES .....                                 | 24,868         | 24,868         |
| 73 | 0604131A | TRACTOR JUITE .....   | 59             | 59             |
| 75 | 0604319A | INDIRECT FIRE PROTECTION CAPABILITY INCREMENT 2—INTERCEPT (IFPC2) ..... | 76,039         | 76,039         |
| 77 | 0604785A | INTEGRATED BASE DEFENSE (BUDGET ACTIVITY 4) .....                       | 4,043          | 4,043          |
| 78 | 0305205A | ENDURANCE UAVS .....  | 26,196         | 26,196         |
|    |          | <b>SUBTOTAL ADVANCED COMPONENT DEVELOPMENT &amp; PROTOTYPES .....</b>   | <b>610,121</b> | <b>610,121</b> |

**SYSTEM DEVELOPMENT & DEMONSTRATION**

|     |          |  |          |         |
|-----|----------|--|----------|---------|
| 79  | 0604201A | AIRCRAFT AVIONICS .....                          | 78,538   | 78,538  |
| 80  | 0604220A | ARMED, DEPLOYABLE HELOS .....                    | 90,494   | 90,494  |
| 81  | 0604270A | ELECTRONIC WARFARE DEVELOPMENT .....             | 181,347  | 176,347 |
|     |          | Program adjustment .....                         | -5,000   |         |
|     |          |  | [-5,000] |         |
| 83  | 0604290A | MID-TIER NETWORKING VEHICULAR RADIO (MNVr) ..... | 12,636   | 12,636  |
| 84  | 0604321A | ALL SOURCE ANALYSIS SYSTEM .....                 | 5,694    | 5,694   |
| 85  | 0604328A | TRACTOR CAGE .....                               | 32,095   | 32,095  |
| 86  | 0604601A | INFANTRY SUPPORT WEAPONS .....                   | 96,478   | 93,078  |
|     |          | XM25 funding ahead of need .....                 | -3,400   |         |
|     |          |  | [-3,400] |         |
| 87  | 0604604A | MEDIUM TACTICAL VEHICLES .....                   | 3,006    | 3,006   |
| 89  | 0604611A | JAVELIN .....                                    | 5,040    | 5,040   |
| 90  | 0604622A | FAMILY OF HEAVY TACTICAL VEHICLES .....          | 3,077    | 3,077   |
| 91  | 0604633A | AIR TRAFFIC CONTROL .....                        | 9,769    | 9,769   |
| 92  | 0604641A | TACTICAL UNMANNED GROUND VEHICLE (TUGV) .....    | 13,141   | 13,141  |
| 99  | 0604710A | NIGHT VISION SYSTEMS—ENG DEV .....               | 32,621   | 32,621  |
| 100 | 0604713A | COMBAT FEEDING, CLOTHING, AND EQUIPMENT .....    | 2,132    | 2,132   |
| 101 | 0604715A | NON-SYSTEM TRAINING DEVICES—ENG DEV .....        | 44,787   | 44,787  |
| 102 | 0604716A | TERRAIN INFORMATION—ENG DEV .....                | 1,008    | 1,008   |

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|------|-----------------|---|-----------------|--------------|------------------|
| 103  | 0604741A        | AIR DEFENSE COMMAND, CONTROL AND INTELLIGENCE—ENG DEV .....         | 73,333          |              | 73,333           |
| 104  | 0604742A        | CONSTRUCTIVE SIMULATION SYSTEMS DEVELOPMENT .....                   | 28,937          |              | 28,937           |
| 105  | 0604746A        | AUTOMATIC TEST EQUIPMENT DEVELOPMENT .....                          | 10,815          |              | 10,815           |
| 106  | 0604760A        | DISTRIBUTIVE INTERACTIVE SIMULATIONS (DIS)—ENG DEV .....            | 13,926          |              | 13,926           |
| 107  | 0604780A        | COMBINED ARMS TACTICAL TRAINER (CATT) CORE .....                    | 17,797          |              | 17,797           |
| 108  | 0604798A        | BRIGADE ANALYSIS, INTEGRATION AND EVALUATION .....                  | 214,270         |              | 214,270          |
| 109  | 0604802A        | WEAPONS AND MUNITIONS—ENG DEV .....                                 | 14,581          |              | 14,581           |
| 110  | 0604804A        | LOGISTICS AND ENGINEER EQUIPMENT—ENG DEV .....                      | 43,706          |              | 43,706           |
| 111  | 0604805A        | COMMAND, CONTROL, COMMUNICATIONS SYSTEMS—ENG DEV .....              | 20,776          |              | 20,776           |
| 112  | 0604807A        | MEDICAL MATERIEL/MEDICAL BIOLOGICAL DEFENSE EQUIPMENT—ENG DEV ..... | 43,395          |              | 43,395           |
| 113  | 0604808A        | LANDMINE WARFARE/BARRIER—ENG DEV .....                              | 104,983         |              | 104,983          |
| 114  | 0604814A        | ARTILLERY MUNITIONS—EMD .....                                       | 4,346           |              | 4,346            |
| 116  | 0604818A        | ARMY TACTICAL COMMAND & CONTROL HARDWARE & SOFTWARE .....           | 77,223          |              | 77,223           |
| 117  | 0604820A        | RADAR DEVELOPMENT .....   | 3,486           |              | 3,486            |
| 118  | 0604822A        | GENERAL FUND ENTERPRISE BUSINESS SYSTEM (GFBS) .....                | 9,963           |              | 9,963            |
| 119  | 0604823A        | FIREFINDER .....  | 20,517          |              | 20,517           |
| 120  | 0604827A        | SOLDIER SYSTEMS—WARRIOR DEMVAL .....                                | 51,851          |              | 51,851           |
| 121  | 0604854A        | ARTILLERY SYSTEMS—EMD .....   | 167,797         |              | 167,797          |
| 122  | 0604869A        | PATRIOT/MEADS COMBINED AGGREGATE PROGRAM (CAP) .....                | 400,861         | -400,861     |                  |
|      |                 | Prohibition of funds for MEADS .....                                |                 | [-400,861]   |                  |
| 123  | 0604870A        | NUCLEAR ARMS CONTROL MONITORING SENSOR NETWORK .....                | 7,922           |              | 7,922            |
| 124  | 0605013A        | INFORMATION TECHNOLOGY DEVELOPMENT .....                            | 51,463          |              | 51,463           |
| 125  | 0605018A        | INTEGRATED PERSONNEL AND PAY SYSTEM-ARMY (PPS-A) .....              | 158,646         |              | 158,646          |
| 126  | 0605450A        | JOINT AIR-TO-GROUND MISSILE (JAGM) .....                            | 10,000          |              | 10,000           |
| 128  | 0605456A        | PAC-3/MSE MISSILE .....   | 69,029          |              | 69,029           |
| 129  | 0605457A        | ARMY INTEGRATED AIR AND MISSILE DEFENSE (AIAMD) .....               | 277,374         |              | 277,374          |
| 130  | 0605625A        | MANNED GROUND VEHICLE .....   | 639,874         |              | 639,874          |

|     |          |  |                  |                  |
|-----|----------|--|------------------|------------------|
| 131 | 0605626A | AERIAL COMMON SENSOR .....   | 47,426           | 47,426           |
| 132 | 0605812A | JOINT LIGHT TACTICAL VEHICLE (LTV) ENGINEERING AND MANUFACTURING DEVELOPMENT PH .. | 72,295           | 72,295           |
| 133 | 0303032A | TROJAN—RH12 .....  | 4,232            | 4,232            |
| 134 | 0304270A | ELECTRONIC WARFARE DEVELOPMENT .....   | 13,942           | 13,942           |
|     |          | <b>SUBTOTAL SYSTEM DEVELOPMENT &amp; DEMONSTRATION .....</b>                       | <b>3,286,629</b> | <b>-409,261</b>  |
|     |          | <b>RD&amp;E MANAGEMENT SUPPORT</b>   |                  |                  |
| 135 | 0604256A | THREAT SIMULATOR DEVELOPMENT .....   | 18,090           | 18,090           |
| 136 | 0604258A | TARGET SYSTEMS DEVELOPMENT .....   | 14,034           | 14,034           |
| 137 | 0604759A | MAJOR T&E INVESTMENT .....   | 37,394           | 37,394           |
| 138 | 0605103A | RAND ARROYO CENTER .....   | 21,026           | 21,026           |
| 139 | 0605301A | ARMY KWAJALEIN ATOLL .....   | 176,816          | 176,816          |
| 140 | 0605326A | CONCEPTS EXPERIMENTATION PROGRAM .....   | 27,902           | 27,902           |
| 142 | 0605601A | ARMY TEST RANGES AND FACILITIES .....  | 369,900          | 369,900          |
| 143 | 0605602A | ARMY TECHNICAL TEST INSTRUMENTATION AND TARGETS .....                              | 69,183           | 69,183           |
| 144 | 0605604A | SURVIVABILITY/LETHALITY ANALYSIS .....   | 44,753           | 44,753           |
| 146 | 0605606A | AIRCRAFT CERTIFICATION .....   | 5,762            | 5,762            |
| 147 | 0605702A | METEOROLOGICAL SUPPORT TO RD&E ACTIVITIES .....                                    | 7,402            | 7,402            |
| 148 | 0605706A | MATERIEL SYSTEMS ANALYSIS .....  | 19,954           | 19,954           |
| 149 | 0605709A | EXPLOITATION OF FOREIGN ITEMS .....  | 5,535            | 5,535            |
| 150 | 0605712A | SUPPORT OF OPERATIONAL TESTING .....   | 67,789           | 67,789           |
| 151 | 0605716A | ARMY EVALUATION CENTER .....   | 62,765           | 62,765           |
| 152 | 0605718A | ARMY MODELING & SIM X-CMD COLLABORATION & INTEG .....                              | 1,545            | 1,545            |
| 153 | 0605801A | PROGRAMWIDE ACTIVITIES .....   | 83,422           | 83,422           |
| 154 | 0605803A | TECHNICAL INFORMATION ACTIVITIES .....   | 50,820           | 50,820           |
| 155 | 0605805A | MUNITIONS STANDARDIZATION, EFFECTIVENESS AND SAFETY .....                          | 46,763           | 46,763           |
| 156 | 0605857A | ENVIRONMENTAL QUALITY TECHNOLOGY MGMT SUPPORT .....                                | 4,601            | 4,601            |
| 157 | 0605898A | MANAGEMENT HQ—R&D .....  | 18,524           | 18,524           |
|     |          | <b>SUBTOTAL RD&amp;E MANAGEMENT SUPPORT .....</b>                                  | <b>1,153,980</b> | <b>1,153,980</b> |
|     |          | <b>OPERATIONAL SYSTEMS DEVELOPMENT</b>   |                  |                  |
| 159 | 0603778A | MLRS PRODUCT IMPROVEMENT PROGRAM .....   | 143,005          | 143,005          |

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| 161  | 0607865A        | PATRIOT PRODUCT IMPROVEMENT .....                         | 109,978         |              | 109,978          |
| 162  | 0102419A        | AEROSTAT JOINT PROJECT OFFICE .....                       | 190,422         | -19,000      | 171,422          |
|      |                 | Program adjustment .....                                  |                 | [-19,000]    |                  |
| 164  | 0203726A        | ADV FIELD ARTILLERY TACTICAL DATA SYSTEM .....            | 32,556          |              | 32,556           |
| 165  | 0203735A        | COMBAT VEHICLE IMPROVEMENT PROGRAMS .....                 | 253,959         |              | 253,959          |
| 166  | 0203740A        | MANEUVER CONTROL SYSTEM .....                             | 68,325          |              | 68,325           |
| 167  | 0203744A        | AIRCRAFT MODIFICATIONS/PRODUCT IMPROVEMENT PROGRAMS ..... | 280,247         | -54,100      | 226,147          |
|      |                 | Ahead of need .....                                       |                 | [-54,100]    |                  |
| 168  | 0203752A        | AIRCRAFT ENGINE COMPONENT IMPROVEMENT PROGRAM .....       | 898             |              | 898              |
| 169  | 0203758A        | DIGITIZATION .....  | 35,180          |              | 35,180           |
| 171  | 0203801A        | MISSILE/AIR DEFENSE PRODUCT IMPROVEMENT PROGRAM .....     | 20,733          |              | 20,733           |
| 172  | 0203808A        | TRACTOR CARD .....  | 63,243          |              | 63,243           |
| 173  | 0208053A        | JOINT TACTICAL GROUND SYSTEM .....                        | 31,738          |              | 31,738           |
| 174  | 0208058A        | JOINT HIGH SPEED VESSEL (HHSV) .....                      | 35              |              | 35               |
| 176  | 0303028A        | SECURITY AND INTELLIGENCE ACTIVITIES .....                | 7,591           |              | 7,591            |
| 177  | 0303140A        | INFORMATION SYSTEMS SECURITY PROGRAM .....                | 15,961          |              | 15,961           |
| 178  | 0303141A        | GLOBAL COMBAT SUPPORT SYSTEM .....                        | 120,927         |              | 120,927          |
| 179  | 0303142A        | SATCOM GROUND ENVIRONMENT (SPACE) .....                   | 15,756          |              | 15,756           |
| 180  | 0303150A        | WMCCS/GLOBAL COMMAND AND CONTROL SYSTEM .....             | 14,443          |              | 14,443           |
| 182  | 0305204A        | TACTICAL UNMANNED AERIAL VEHICLES .....                   | 31,303          |              | 31,303           |
| 183  | 0305208A        | DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS .....           | 40,876          |              | 40,876           |
| 184  | 0305219A        | MQ-1 SKY WARRIOR A UAV .....                              | 74,618          |              | 74,618           |
| 185  | 0305232A        | RQ-11 UAV .....   | 4,039           |              | 4,039            |
| 186  | 0305233A        | RQ-7 UAV .....  | 31,158          |              | 31,158           |
| 187  | 0305235A        | VERTICAL UAS .....  | 2,387           |              | 2,387            |
| 188  | 0307665A        | BIOMETRICS ENABLED INTELLIGENCE .....                     | 15,248          |              | 15,248           |
| 189  | 0708045A        | END ITEM INDUSTRIAL PREPAREDNESS ACTIVITIES .....         | 59,908          |              | 59,908           |

|      |            |  |                  |                 |                  |
|------|------------|--|------------------|-----------------|------------------|
| 189A | 9999999999 | CLASSIFIED PROGRAMS .....  | 4,628            |                 | 4,628            |
|      |            | <b>SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT .....</b>              | <b>1,669,162</b> | <b>-73,100</b>  | <b>1,596,062</b> |
|      |            | <b>TOTAL RESEARCH, DEVELOPMENT, TEST &amp; EVAL, ARMY .....</b>    | <b>8,929,415</b> | <b>-472,111</b> | <b>8,457,304</b> |
|      |            | <b>RESEARCH, DEVELOPMENT, TEST &amp; EVAL, NAVY</b>                |                  |                 |                  |
|      |            | <b>BASIC RESEARCH</b>  |                  |                 |                  |
| 1    | 0601103N   | UNIVERSITY RESEARCH INITIATIVES .....                              | 113,690          | 10,000          | 123,690          |
|      |            | Increase Defense University Research Instrumentation Program ..... |                  | [10,000]        |                  |
| 2    | 0601152N   | IN-HOUSE LABORATORY INDEPENDENT RESEARCH .....                     | 18,261           |                 | 18,261           |
| 3    | 0601153N   | DEFENSE RESEARCH SCIENCES .....                                    | 473,070          |                 | 473,070          |
| 003A | 0601XXXN   | SCIENCE AND TECHNOLOGY .....                                       |                  | 3,450           | 3,450            |
|      |            | Transfer from PE 0205658N .....                                    |                  | [3,450]         |                  |
|      |            | <b>SUBTOTAL BASIC RESEARCH .....</b>                               | <b>605,021</b>   | <b>13,450</b>   | <b>618,471</b>   |
|      |            | <b>APPLIED RESEARCH</b>  |                  |                 |                  |
| 4    | 0602114N   | POWER PROJECTION APPLIED RESEARCH .....                            | 89,189           |                 | 89,189           |
| 5    | 0602123N   | FORCE PROTECTION APPLIED RESEARCH .....                            | 143,301          |                 | 143,301          |
| 6    | 0602131M   | MARINE CORPS LANDING FORCE TECHNOLOGY .....                        | 46,528           |                 | 46,528           |
| 7    | 0602235N   | COMMON PICTURE APPLIED RESEARCH .....                              | 41,696           |                 | 41,696           |
| 8    | 0602236N   | WARFIGHTER SUSTANMENT APPLIED RESEARCH .....                       | 44,127           |                 | 44,127           |
| 9    | 0602271N   | ELECTROMAGNETIC SYSTEMS APPLIED RESEARCH .....                     | 78,228           |                 | 78,228           |
| 10   | 0602435N   | OCEAN WARFIGHTING ENVIRONMENT APPLIED RESEARCH .....               | 49,635           |                 | 49,635           |
| 11   | 0602651M   | JOINT NON-LETHAL WEAPONS APPLIED RESEARCH .....                    | 5,973            |                 | 5,973            |
| 12   | 0602747N   | UNDERSEA WARFARE APPLIED RESEARCH .....                            | 96,814           |                 | 96,814           |
| 13   | 0602750N   | FUTURE NAVAL CAPABILITIES APPLIED RESEARCH .....                   | 162,417          |                 | 162,417          |
| 14   | 0602782N   | MINE AND EXPEDITIONARY WARFARE APPLIED RESEARCH .....              | 32,394           |                 | 32,394           |
|      |            | <b>SUBTOTAL APPLIED RESEARCH .....</b>                             | <b>790,302</b>   |                 | <b>790,302</b>   |
|      |            | <b>ADVANCED TECHNOLOGY DEVELOPMENT</b>                             |                  |                 |                  |
| 15   | 0603114N   | POWER PROJECTION ADVANCED TECHNOLOGY .....                         | 56,543           |                 | 56,543           |
| 16   | 0603123N   | FORCE PROTECTION ADVANCED TECHNOLOGY .....                         | 18,616           |                 | 18,616           |

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| 19   | 0603271N        | ELECTROMAGNETIC SYSTEMS ADVANCED TECHNOLOGY .....               | 54,858          |              | 54,858           |
| 20   | 0603640M        | USMC ADVANCED TECHNOLOGY DEMONSTRATION (ATD) .....              | 130,598         |              | 130,598          |
| 21   | 0603651M        | JOINT NON-LETHAL WEAPONS TECHNOLOGY DEVELOPMENT .....           | 11,706          |              | 11,706           |
| 22   | 0603673N        | FUTURE NAVAL CAPABILITIES ADVANCED TECHNOLOGY DEVELOPMENT ..... | 256,382         |              | 256,382          |
| 23   | 0603729N        | WARFIGHTER PROTECTION ADVANCED TECHNOLOGY .....                 | 3,880           |              | 3,880            |
| 25   | 0603758N        | NAVY WARFIGHTING EXPERIMENTS AND DEMONSTRATIONS .....           | 51,819          |              | 51,819           |
|  |                 | <b>SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT .....</b>           | <b>584,402</b>  |              | <b>584,402</b>   |
| <b>ADVANCED COMPONENT DEVELOPMENT &amp; PROTOTYPES</b> |                 |   |                 |              |                  |
| 28   | 0603207N        | AIR/OCEAN TACTICAL APPLICATIONS .....                           | 34,085          |              | 34,085           |
| 29   | 0603216N        | AVIATION SURVIVABILITY .....                                    | 8,783           |              | 8,783            |
| 30   | 0603237N        | DEPLOYABLE JOINT COMMAND AND CONTROL .....                      | 3,773           |              | 3,773            |
| 31   | 0603251N        | AIRCRAFT SYSTEMS .....  | 24,512          |              | 24,512           |
| 32   | 0603254N        | ASW SYSTEMS DEVELOPMENT .....                                   | 8,090           |              | 8,090            |
| 33   | 0603261N        | TACTICAL AIRBORNE RECONNAISSANCE .....                          | 5,301           |              | 5,301            |
| 34   | 0603382N        | ADVANCED COMBAT SYSTEMS TECHNOLOGY .....                        | 1,506           |              | 1,506            |
| 35   | 0603502N        | SURFACE AND SHALLOW WATER MINE COUNTERMEASURES .....            | 190,622         |              | 190,622          |
| 36   | 0603506N        | SURFACE SHIP TORPEDO DEFENSE .....                              | 93,346          |              | 93,346           |
| 37   | 0603512N        | CARRIER SYSTEMS DEVELOPMENT .....                               | 108,871         |              | 108,871          |
| 39   | 0603525N        | PILOT FISH .....  | 101,169         |              | 101,169          |
| 40   | 0603527N        | RETRACT LARCH .....   | 74,312          |              | 74,312           |
| 41   | 0603536N        | RETRACT JUNIPER .....   | 90,730          |              | 90,730           |
| 42   | 0603542N        | RADIOLOGICAL CONTROL .....                                      | 777             |              | 777              |
| 43   | 0603553N        | SURFACE ASW .....   | 6,704           |              | 6,704            |
| 44   | 0603561N        | ADVANCED SUBMARINE SYSTEM DEVELOPMENT .....                     | 555,123         | 374,400      | 929,523          |
|  |                 | Program increase .....  |                 | [374,400]    |                  |
| 45   | 0603562N        | SUBMARINE TACTICAL WARFARE SYSTEMS .....                        | 9,368           |              | 9,368            |

|    |          |   |         |         |
|----|----------|---|---------|---------|
| 46 | 0603563N | SHIP CONCEPT ADVANCED DESIGN .....  | 24,609  | 24,609  |
| 47 | 0603564N | SHIP PRELIMINARY DESIGN & FEASIBILITY STUDIES .....                       | 13,710  | 13,710  |
| 48 | 0603570N | ADVANCED NUCLEAR POWER SYSTEMS .....                                      | 249,748 | 249,748 |
| 49 | 0603573N | ADVANCED SURFACE MACHINERY SYSTEMS .....                                  | 29,897  | 29,897  |
| 50 | 0603576N | CHALK EAGLE .....   | 509,988 | 509,988 |
| 51 | 0603581N | LITTORAL COMBAT SHIP (LCS) .....  | 429,420 | 429,420 |
| 52 | 0603582N | COMBAT SYSTEM INTEGRATION .....   | 56,551  | 56,551  |
| 53 | 0603609N | CONVENTIONAL MUNITIONS .....  | 7,342   | 7,342   |
| 54 | 0603611M | MARINE CORPS ASSAULT VEHICLES .....                                       | 95,182  | 95,182  |
| 55 | 0603635M | MARINE CORPS GROUND COMBAT/SUPPORT SYSTEM .....                           | 10,496  | 10,496  |
| 56 | 0603654N | JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT .....                        | 52,331  | 52,331  |
| 57 | 0603658N | COOPERATIVE ENGAGEMENT .....  | 56,512  | 56,512  |
| 58 | 0603713N | OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT .....                            | 7,029   | 7,029   |
| 59 | 0603721N | ENVIRONMENTAL PROTECTION .....  | 21,080  | 21,080  |
| 60 | 0603724N | NAVY ENERGY PROGRAM .....   | 55,324  | 55,324  |
| 61 | 0603725N | FACILITIES IMPROVEMENT .....  | 3,401   | 3,401   |
| 62 | 0603734N | CHALK CORAL .....   | 45,966  | 45,966  |
| 63 | 0603739N | NAVY LOGISTIC PRODUCTIVITY .....  | 3,811   | 3,811   |
| 64 | 0603746N | RETRACT MAPLE .....   | 341,305 | 341,305 |
| 65 | 0603748N | LINK PLUMERIA .....   | 181,220 | 181,220 |
| 66 | 0603751N | RETRACT ELM .....   | 174,014 | 174,014 |
| 68 | 0603764N | LINK EVERGREEN .....  | 68,654  | 68,654  |
| 69 | 0603787N | SPECIAL PROCESSES .....   | 44,487  | 44,487  |
| 70 | 0603790N | NATO RESEARCH AND DEVELOPMENT .....                                       | 9,389   | 9,389   |
| 71 | 0603795N | LAND ATTACK TECHNOLOGY .....  | 16,132  | 16,132  |
| 72 | 0603851M | JOINT NON-LETHAL WEAPONS TESTING .....                                    | 44,994  | 44,994  |
| 73 | 0603860N | JOINT PRECISION APPROACH AND LANDING SYSTEMS—DEMVAL .....                 | 137,369 | 137,369 |
| 76 | 0604272N | TACTICAL AIR DIRECTION INFRARED COUNTERMEASURES (TADIRCW) .....           | 73,934  | 73,934  |
| 77 | 0604279N | ASE SELF-PROTECTION OPTIMIZATION .....                                    | 711     | 711     |
| 78 | 0604653N | JOINT COUNTER RADIO CONTROLLED IED ELECTRONIC WARFARE (ICREW) .....       | 71,300  | 71,300  |
| 79 | 0604659N | PRECISION STRIKE WEAPONS DEVELOPMENT PROGRAM .....                        | 5,654   | 5,654   |
| 80 | 0604707N | SPACE AND ELECTRONIC WARFARE (SEW) ARCHITECTURE/ENGINEERING SUPPORT ..... | 31,549  | 31,549  |

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| Line  | Program Element | Item   | FY 2013 Request  | House Change   | House Authorized |
|---|-----------------|--|------------------|----------------|------------------|
| 82  | 0604786N        | OFFENSIVE ANTI-SURFACE WARFARE WEAPON DEVELOPMENT .....                            | 86,801           |                | 86,801           |
| 83  | 0605812M        | JOINT LIGHT TACTICAL VEHICLE (LTV) ENGINEERING AND MANUFACTURING DEVELOPMENT PH .. | 44,500           |                | 44,500           |
| 84  | 0303354N        | ASW SYSTEMS DEVELOPMENT—MIP .....  | 13,172           |                | 13,172           |
| 86  | 0304270N        | ELECTRONIC WARFARE DEVELOPMENT—MIP .....   | 643              |                | 643              |
|   |                 | <b>SUBTOTAL ADVANCED COMPONENT DEVELOPMENT &amp; PROTOTYPES .....</b>              | <b>4,335,297</b> | <b>374,400</b> | <b>4,709,697</b> |
| <b>SYSTEM DEVELOPMENT &amp; DEMONSTRATION</b> |                 |  |                  |                |                  |
| 87  | 0604212N        | OTHER HELO DEVELOPMENT .....   | 33,978           |                | 33,978           |
| 88  | 0604214N        | AV-8B AIRCRAFT—ENG DEV .....   | 32,789           |                | 32,789           |
| 89  | 0604215N        | STANDARDS DEVELOPMENT .....  | 84,988           |                | 84,988           |
| 90  | 0604216N        | MULTI-MISSION HELICOPTER UPGRADE DEVELOPMENT .....                                 | 6,866            |                | 6,866            |
| 91  | 0604218N        | AIR/OCEAN EQUIPMENT ENGINEERING .....  | 4,060            |                | 4,060            |
| 92  | 0604221N        | P-3 MODERNIZATION PROGRAM .....  | 3,451            |                | 3,451            |
| 93  | 0604230N        | WARFARE SUPPORT SYSTEM .....   | 13,071           |                | 13,071           |
| 94  | 0604231N        | TACTICAL COMMAND SYSTEM .....  | 71,645           |                | 71,645           |
| 95  | 0604234N        | ADVANCED HAWKEYE .....   | 119,065          |                | 119,065          |
| 96  | 0604245N        | H-1 UPGRADES .....   | 31,105           |                | 31,105           |
| 97  | 0604261N        | ACOUSTIC SEARCH SENSORS .....  | 34,299           |                | 34,299           |
| 98  | 0604262N        | V-22A .....  | 54,412           |                | 54,412           |
| 99  | 0604264N        | AIR CREW SYSTEMS DEVELOPMENT .....   | 2,717            |                | 2,717            |
| 100   | 0604269N        | EA-18 .....  | 13,009           |                | 13,009           |
| 101   | 0604270N        | ELECTRONIC WARFARE DEVELOPMENT .....   | 51,304           |                | 51,304           |
| 102   | 0604273N        | VH-71A EXECUTIVE HELO DEVELOPMENT .....  | 61,163           |                | 61,163           |
| 103   | 0604274N        | NEXT GENERATION JAMMER (NGJ) .....   | 187,024          |                | 187,024          |
| 104   | 0604280N        | JOINT TACTICAL RADIO SYSTEM—NAVY (JTRS-NAVY) .....                                 | 337,480          |                | 337,480          |
| 105   | 0604307N        | SURFACE COMBATANT COMBAT SYSTEM ENGINEERING .....                                  | 260,616          | 250,000        | 510,616          |
|   |                 | Cruiser Retention .....  |                  | [250,000]      |                  |

|     |          |  |           |         |
|-----|----------|--|-----------|---------|
| 106 | 0604311N | LPD-17 CLASS SYSTEMS INTEGRATION .....   | 824       | 824     |
| 107 | 0604329N | SMALL DIAMETER BOMB (SDB) .....  | 31,064    | 31,064  |
| 108 | 0604366N | STANDARD MISSILE IMPROVEMENTS .....  | 63,891    | 63,891  |
| 109 | 0604373N | AIRBORNE MCM .....   | 73,246    | 73,246  |
| 110 | 0604376M | MARINE AIR GROUND TASK FORCE (MAGTF) ELECTRONIC WARFARE (EW) FOR AVIATION .....  | 10,568    | 10,568  |
| 111 | 0604378N | NAVAL INTEGRATED FIRE CONTROL—COUNTER AIR SYSTEMS ENGINEERING .....              | 39,974    | 39,974  |
| 112 | 0604404N | UNMANNED CARRIER LAUNCHED AIRBORNE SURVEILLANCE AND STRIKE (UCLASS) SYSTEM ..... | -75,000   | 47,481  |
|     |          | Transfer from RDN 112 to RDN 167 .....   | [-75,000] |         |
| 113 | 0604501N | ADVANCED ABOVE WATER SENSORS .....   | 255,516   | 255,516 |
| 114 | 0604503N | SSN-688 AND TRIDENT MODERNIZATION .....  | 82,620    | 82,620  |
| 115 | 0604504N | AIR CONTROL .....  | 5,633     | 5,633   |
| 116 | 0604512N | SHIPBOARD AVIATION SYSTEMS .....   | 55,826    | 55,826  |
| 117 | 0604518N | COMBAT INFORMATION CENTER CONVERSION .....                                       | 918       | 918     |
| 118 | 0604558N | NEW DESIGN SSN .....   | 165,230   | 165,230 |
| 119 | 0604562N | SUBMARINE TACTICAL WARFARE SYSTEM .....  | 49,141    | 49,141  |
| 120 | 0604567N | SHIP CONTRACT DESIGN/ LIVE FIRE T&E .....  | 196,737   | 196,737 |
| 121 | 0604574N | NAVY TACTICAL COMPUTER RESOURCES .....   | 3,889     | 3,889   |
| 122 | 0604601N | MINE DEVELOPMENT .....   | 8,335     | 8,335   |
| 123 | 0604610N | LIGHTWEIGHT TORPEDO DEVELOPMENT .....  | 49,818    | 49,818  |
| 124 | 0604654N | JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT .....                               | 10,099    | 10,099  |
| 125 | 0604703N | PERSONNEL, TRAINING, SIMULATION, AND HUMAN FACTORS .....                         | 7,348     | 7,348   |
| 126 | 0604727N | JOINT STANDOFF WEAPON SYSTEMS .....  | 5,518     | 5,518   |
| 127 | 0604755N | SHIP SELF DEFENSE (DETECT & CONTROL) .....                                       | 87,662    | 87,662  |
| 128 | 0604756N | SHIP SELF DEFENSE (ENGAGE: HARD KILL) .....                                      | 64,079    | 64,079  |
| 129 | 0604757N | SHIP SELF DEFENSE (ENGAGE: SOFT KILL/EW) .....                                   | 1,125     | 152,614 |
|     |          | Cruiser Retention .....  | [1,125]   |         |
| 131 | 0604771N | MEDICAL DEVELOPMENT .....  | 12,707    | 12,707  |
| 132 | 0604777N | NAVIGATION/ID SYSTEM .....   | 47,764    | 47,764  |
| 133 | 0604800M | JOINT STRIKE FIGHTER (JSF)—EMD .....   | 737,149   | 737,149 |
| 134 | 0604800N | JOINT STRIKE FIGHTER (JSF)—EMD .....   | 743,926   | 743,926 |
| 135 | 0605013M | INFORMATION TECHNOLOGY DEVELOPMENT .....   | 12,143    | 12,143  |
| 136 | 0605013N | INFORMATION TECHNOLOGY DEVELOPMENT .....   | 72,209    | 72,209  |

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| Line | Program Element | Item   | FY 2013 Request  | House Change   | House Authorized |
|------|-----------------|--|------------------|----------------|------------------|
| 138  | 0605212N        | CH-53K RDTE .....  | 606,204          |                | 606,204          |
| 140  | 0605500N        | MULTI-MISSION MARITIME AIRCRAFT (MMA) .....                  | 421,102          |                | 421,102          |
| 141  | 0204202N        | DDG-1000 .....   | 124,655          |                | 124,655          |
| 142  | 0304231N        | TACTICAL COMMAND SYSTEM—MIP .....                            | 1,170            |                | 1,170            |
| 144  | 0304785N        | TACTICAL CRYPTOLOGIC SYSTEMS .....                           | 23,255           |                | 23,255           |
|      |                 | <b>SUBTOTAL SYSTEM DEVELOPMENT &amp; DEMONSTRATION .....</b> | <b>5,747,232</b> | <b>176,125</b> | <b>5,923,357</b> |
|      |                 | <b>RD&amp;E MANAGEMENT SUPPORT</b>                           |                  |                |                  |
| 146  | 0604256N        | THREAT SIMULATOR DEVELOPMENT .....                           | 30,790           |                | 30,790           |
| 147  | 0604258N        | TARGET SYSTEMS DEVELOPMENT .....                             | 59,221           |                | 59,221           |
| 148  | 0604759N        | MAJOR T&E INVESTMENT .....                                   | 35,894           |                | 35,894           |
| 149  | 0605126N        | JOINT THEATER AIR AND MISSILE DEFENSE ORGANIZATION .....     | 7,573            |                | 7,573            |
| 150  | 0605152N        | STUDIES AND ANALYSIS SUPPORT—NAVY .....                      | 20,963           |                | 20,963           |
| 151  | 0605154N        | CENTER FOR NAVAL ANALYSES .....                              | 46,856           |                | 46,856           |
| 153  | 0605804N        | TECHNICAL INFORMATION SERVICES .....                         | 796              |                | 796              |
| 154  | 0605853N        | MANAGEMENT, TECHNICAL & INTERNATIONAL SUPPORT .....          | 32,782           |                | 32,782           |
| 155  | 0605856N        | STRATEGIC TECHNICAL SUPPORT .....                            | 3,306            |                | 3,306            |
| 156  | 0605861N        | RD&E SCIENCE AND TECHNOLOGY MANAGEMENT .....                 | 70,302           |                | 70,302           |
| 157  | 0605863N        | RD&E SHIP AND AIRCRAFT SUPPORT .....                         | 144,033          |                | 144,033          |
| 158  | 0605864N        | TEST AND EVALUATION SUPPORT .....                            | 342,298          |                | 342,298          |
| 159  | 0605865N        | OPERATIONAL TEST AND EVALUATION CAPABILITY .....             | 16,399           |                | 16,399           |
| 160  | 0605866N        | NAVY SPACE AND ELECTRONIC WARFARE (SEW) SUPPORT .....        | 4,579            |                | 4,579            |
| 161  | 0605867N        | SEW SURVEILLANCE/RECONNAISSANCE SUPPORT .....                | 8,000            |                | 8,000            |
| 162  | 0605873M        | MARINE CORPS PROGRAM WIDE SUPPORT .....                      | 18,490           |                | 18,490           |
| 163  | 0305885N        | TACTICAL CRYPTOLOGIC ACTIVITIES .....                        | 2,795            |                | 2,795            |
|      |                 | <b>SUBTOTAL RD&amp;E MANAGEMENT SUPPORT .....</b>            | <b>845,077</b>   |                | <b>845,077</b>   |



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|------|-----------------|---|------------------|----------------|------------------|
| 197  | 0207161N        | TACTICAL AIM MISSILES .....                                   | 21,107           |                | 21,107           |
| 198  | 0207163N        | ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE (AMRAAM) .....       | 2,857            |                | 2,857            |
| 199  | 0208058N        | JOINT HIGH SPEED VESSEL (JHSV) .....                          | 1,932            |                | 1,932            |
| 204  | 0303109N        | SATELLITE COMMUNICATIONS (SPACE) .....                        | 188,482          |                | 188,482          |
| 205  | 0303138N        | CONSOLIDATED AFLOAT NETWORK ENTERPRISE SERVICES (CANES) ..... | 16,749           |                | 16,749           |
| 206  | 0303140N        | INFORMATION SYSTEMS SECURITY PROGRAM .....                    | 26,307           |                | 26,307           |
| 207  | 0303150M        | WMCCS/GLOBAL COMMAND AND CONTROL SYSTEM .....                 | 500              |                | 500              |
| 210  | 0305149N        | COBRA JUDY .....  | 17,091           |                | 17,091           |
| 211  | 0305160N        | NAVY METEOROLOGICAL AND OCEAN SENSORS-SPACE (METOC) .....     | 810              |                | 810              |
| 212  | 0305192N        | MILITARY INTELLIGENCE PROGRAM (MIP) ACTIVITIES .....          | 8,617            |                | 8,617            |
| 213  | 0305204N        | TACTICAL UNMANNED AERIAL VEHICLES .....                       | 9,066            |                | 9,066            |
| 215  | 0305207N        | MANNED RECONNAISSANCE SYSTEMS .....                           | 30,654           |                | 30,654           |
| 216  | 0305208M        | DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS .....               | 25,917           |                | 25,917           |
| 217  | 0305208N        | DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS .....               | 14,676           |                | 14,676           |
| 218  | 0305220N        | RQ-4 UAV .....  | 657,483          |                | 657,483          |
| 219  | 0305231N        | MQ-8 UAV .....  | 99,600           |                | 99,600           |
| 220  | 0305232M        | RQ-11 UAV .....   | 495              |                | 495              |
| 221  | 0305233N        | RQ-7 UAV .....  | 863              |                | 863              |
| 223  | 0305234N        | SMALL (LEVEL 0) TACTICAL UAS (STUASLO) .....                  | 9,734            |                | 9,734            |
| 225  | 0305239M        | RQ-21A .....  | 22,343           |                | 22,343           |
| 226  | 0308601N        | MODELING AND SIMULATION SUPPORT .....                         | 5,908            |                | 5,908            |
| 227  | 0702207N        | DEPOT MAINTENANCE (NON-IF) .....                              | 27,391           |                | 27,391           |
| 229  | 0708011N        | INDUSTRIAL PREPAREDNESS .....                                 | 54,879           |                | 54,879           |
| 230  | 0708730N        | MARITIME TECHNOLOGY (MARITECH) .....                          | 5,000            |                | 5,000            |
| 230A | 99999999999     | CLASSIFIED PROGRAMS .....                                     | 1,151,159        | 200,000        | 1,351,159        |
|      |                 | Program increase .....  |                  | [200,000]      |                  |
|      |                 | <b>SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT .....</b>         | <b>3,975,546</b> | <b>271,550</b> | <b>4,247,096</b> |

|    |          |   |                  |          |                  |
|----|----------|---|------------------|----------|------------------|
|    |          |   | 16,882,877       | 835,525  | 17,718,402       |
|    |          | <b>TOTAL RESEARCH, DEVELOPMENT, TEST &amp; EVAL, NAVY .....</b> |                  |          |                  |
|    |          | <b>RESEARCH, DEVELOPMENT, TEST &amp; EVAL, AF</b>               |                  |          |                  |
|    |          | <b>BASIC RESEARCH</b>   |                  |          |                  |
| 1  | 0601102F | DEFENSE RESEARCH SCIENCES .....                                 | 361,787          |          | 361,787          |
| 2  | 0601103F | UNIVERSITY RESEARCH INITIATIVES .....                           | 141,153          |          | 141,153          |
| 3  | 0601108F | HIGH ENERGY LASER RESEARCH INITIATIVES .....                    | 13,094           |          | 13,094           |
|    |          | <b>SUBTOTAL BASIC RESEARCH .....</b>                            | <b>516,034</b>   |          | <b>516,034</b>   |
|    |          | <b>APPLIED RESEARCH</b>   |                  |          |                  |
| 4  | 0602102F | MATERIALS .....   | 114,166          |          | 114,166          |
| 5  | 0602201F | AEROSPACE VEHICLE TECHNOLOGIES .....                            | 120,719          |          | 120,719          |
| 6  | 0602202F | HUMAN EFFECTIVENESS APPLIED RESEARCH .....                      | 89,319           |          | 89,319           |
| 7  | 0602203F | AEROSPACE PROPULSION .....                                      | 232,547          |          | 232,547          |
| 8  | 0602204F | AEROSPACE SENSORS .....   | 127,637          |          | 127,637          |
| 9  | 0602601F | SPACE TECHNOLOGY .....  | 98,375           |          | 98,375           |
| 10 | 0602602F | CONVENTIONAL MUNITIONS .....                                    | 77,175           |          | 77,175           |
| 11 | 0602605F | DIRECTED ENERGY TECHNOLOGY .....                                | 106,196          |          | 106,196          |
| 12 | 0602788F | DOMINANT INFORMATION SCIENCES AND METHODS .....                 | 104,362          |          | 104,362          |
| 13 | 0602890F | HIGH ENERGY LASER RESEARCH .....                                | 38,557           |          | 38,557           |
|    |          | <b>SUBTOTAL APPLIED RESEARCH .....</b>                          | <b>1,109,053</b> |          | <b>1,109,053</b> |
|    |          | <b>ADVANCED TECHNOLOGY DEVELOPMENT</b>                          |                  |          |                  |
| 14 | 0603112F | ADVANCED MATERIALS FOR WEAPON SYSTEMS .....                     | 47,890           | 10,000   | 57,890           |
|    |          | Increase Materials Affordability Initiative program .....       |                  | [10,000] |                  |
| 15 | 0603199F | SUSTAINMENT SCIENCE AND TECHNOLOGY (S&T) .....                  | 6,565            |          | 6,565            |
| 16 | 0603203F | ADVANCED AEROSPACE SENSORS .....                                | 37,657           |          | 37,657           |
| 17 | 0603211F | AEROSPACE TECHNOLOGY DEV/DEMO .....                             | 81,376           |          | 81,376           |
| 18 | 0603216F | AEROSPACE PROPULSION AND POWER TECHNOLOGY .....                 | 151,152          |          | 151,152          |
| 19 | 0603270F | ELECTRONIC COMBAT TECHNOLOGY .....                              | 32,941           |          | 32,941           |
| 20 | 0603401F | ADVANCED SPACECRAFT TECHNOLOGY .....                            | 64,557           |          | 64,557           |

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|--|-----------------|--|-----------------|---------------|------------------|
| 21   | 0603444F        | MAUI SPACE SURVEILLANCE SYSTEM (MSSS) .....                | 29,256          |               | 29,256           |
| 22   | 0603456F        | HUMAN EFFECTIVENESS ADVANCED TECHNOLOGY DEVELOPMENT .....  | 21,523          |               | 21,523           |
| 23   | 0603601F        | CONVENTIONAL WEAPONS TECHNOLOGY .....                      | 36,352          |               | 36,352           |
| 24   | 0603605F        | ADVANCED WEAPONS TECHNOLOGY .....                          | 19,004          |               | 19,004           |
| 25   | 0603680F        | MANUFACTURING TECHNOLOGY PROGRAM .....                     | 37,045          |               | 37,045           |
| 26   | 0603788F        | BATTLESPACE KNOWLEDGE DEVELOPMENT AND DEMONSTRATION .....  | 31,419          |               | 31,419           |
|  |                 | <b>SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT .....</b>      | <b>596,737</b>  | <b>10,000</b> | <b>606,737</b>   |
| <b>ADVANCED COMPONENT DEVELOPMENT &amp; PROTOTYPES</b> |                 |  |                 |               |                  |
| 28   | 0603260F        | INTELLIGENCE ADVANCED DEVELOPMENT .....                    | 3,866           |               | 3,866            |
| 29   | 0603287F        | PHYSICAL SECURITY EQUIPMENT .....                          | 3,704           |               | 3,704            |
| 30   | 0603430F        | ADVANCED EHF MILSATCOM (SPACE) .....                       | 229,171         | -1,500        | 227,671          |
|  |                 | Project decrease .....                                     |                 | [-1,500]      |                  |
| 31   | 0603432F        | POLAR MILSATCOM (SPACE) .....                              | 120,676         |               | 120,676          |
| 32   | 0603438F        | SPACE CONTROL TECHNOLOGY .....                             | 25,144          | -2,000        | 23,144           |
|  |                 | Project decrease .....                                     |                 | [-2,000]      |                  |
| 33   | 0603742F        | COMBAT IDENTIFICATION TECHNOLOGY .....                     | 32,243          |               | 32,243           |
| 34   | 0603790F        | NATO RESEARCH AND DEVELOPMENT .....                        | 4,507           |               | 4,507            |
| 35   | 0603791F        | INTERNATIONAL SPACE COOPERATIVE R&D .....                  | 652             |               | 652              |
| 36   | 0603830F        | SPACE PROTECTION PROGRAM (SPP) .....                       | 10,429          |               | 10,429           |
| 37   | 0603850F        | INTEGRATED BROADCAST SERVICE—DEM/VAL .....                 | 19,938          |               | 19,938           |
| 38   | 0603851F        | INTERCONTINENTAL BALLISTIC MISSILE—DEM/VAL .....           | 71,181          |               | 71,181           |
| 39   | 0603854F        | WIDEBAND GLOBAL SATCOM RDT&E (SPACE) .....                 | 12,027          |               | 12,027           |
| 40   | 0603859F        | POLLUTION PREVENTION—DEM/VAL .....                         | 2,054           |               | 2,054            |
| 41   | 0603860F        | JOINT PRECISION APPROACH AND LANDING SYSTEMS—DEM/VAL ..... | 57,975          |               | 57,975           |
| 42   | 0604015F        | LONG RANGE STRIKE .....                                    | 291,742         |               | 291,742          |
| 43   | 0604283F        | BATTLE MGMT COM & CTRL SENSOR DEVELOPMENT .....            | 114,417         |               | 114,417          |

|   |          |   |               |                  |
|---|----------|---|---------------|------------------|
| 44  | 0604317F | TECHNOLOGY TRANSFER .....   | 2,576         | 2,576            |
| 45  | 0604327F | HARD AND DEEPLY BURIED TARGET DEFEAT SYSTEM (HDBTDS) PROGRAM .....    | 16,711        | 16,711           |
| 47  | 0604337F | REQUIREMENTS ANALYSIS AND MATURATION .....                            | 16,343        | 16,343           |
| 48  | 0604422F | WEATHER SATELLITE FOLLOW-ON .....                                     | 2,000         | 2,000            |
| 50  | 0604635F | GROUND ATTACK WEAPONS FUZE DEVELOPMENT .....                          | 9,423         | 9,423            |
| 54  | 0604857F | OPERATIONALLY RESPONSIVE SPACE .....                                  | 25,000        | 25,000           |
|   |          | Operationally Responsive Space .....                                  | [25,000]      |                  |
| 55  | 0604858F | TECH TRANSITION PROGRAM .....   | 37,558        | 34,558           |
|   |          | Project decrease .....  | [-3,000]      |                  |
| 56  | 0305164F | NAVSTAR GLOBAL POSITIONING SYSTEM (USER EQUIPMENT) (SPACE) .....      | 96,840        | 96,840           |
|   |          | <b>SUBTOTAL ADVANCED COMPONENT DEVELOPMENT &amp; PROTOTYPES .....</b> | <b>18,500</b> | <b>1,199,677</b> |
| <b>SYSTEM DEVELOPMENT &amp; DEMONSTRATION</b> |          |   |               |                  |
| 58  | 0603840F | GLOBAL BROADCAST SERVICE (GBS) .....                                  | 14,652        | 14,652           |
| 59  | 0604222F | NUCLEAR WEAPONS SUPPORT .....   | 25,713        | 25,713           |
| 60  | 0604233F | SPECIALIZED UNDERGRADUATE FLIGHT TRAINING .....                       | 6,583         | 6,583            |
| 61  | 0604270F | ELECTRONIC WARFARE DEVELOPMENT .....                                  | 1,975         | 1,975            |
| 62  | 0604280F | JOINT TACTICAL RADIO .....  | 2,594         | 2,594            |
| 63  | 0604281F | TACTICAL DATA NETWORKS ENTERPRISE .....                               | 24,534        | 24,534           |
| 64  | 0604287F | PHYSICAL SECURITY EQUIPMENT .....                                     | 51            | 51               |
| 65  | 0604329F | SMALL DIAMETER BOMB (SDB)—EMD .....                                   | 143,000       | 143,000          |
| 66  | 0604421F | COUNTERSPACE SYSTEMS .....  | 28,797        | 28,797           |
| 67  | 0604425F | SPACE SITUATION AWARENESS SYSTEMS .....                               | 267,252       | 267,252          |
| 68  | 0604429F | AIRBORNE ELECTRONIC ATTACK .....                                      | 4,118         | 4,118            |
| 69  | 0604441F | SPACE BASED INFRARED SYSTEM (SBIRS) HIGH EMD .....                    | 448,594       | 446,594          |
|   |          | Project decrease .....  | [-2,000]      |                  |
| 70  | 0604602F | ARMAMENT/ORDNANCE DEVELOPMENT .....                                   | 9,951         | 9,951            |
| 71  | 0604604F | SUBMUNITIONS .....  | 2,567         | 2,567            |
| 72  | 0604617F | AGILE COMBAT SUPPORT .....  | 13,059        | 13,059           |
| 73  | 0604706F | LIFE SUPPORT SYSTEMS .....  | 9,720         | 9,720            |
| 74  | 0604735F | COMBAT TRAINING RANGES .....  | 9,222         | 9,222            |
| 76  | 0604750F | INTELLIGENCE EQUIPMENT .....  | 803           | 803              |

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| 77   | 0604800F        | F-35—EMD .....   | 1,210,306        |               | 1,210,306        |
| 78   | 0604851F        | INTERCONTINENTAL BALLISTIC MISSILE—EMD .....                 | 135,437          |               | 135,437          |
| 79   | 0604853F        | EVOLVED EXPENDABLE LAUNCH VEHICLE PROGRAM (SPACE)—EMD .....  | 7,980            |               | 7,980            |
| 80   | 0604932F        | LONG RANGE STANDOFF WEAPON .....                             | 2,004            |               | 2,004            |
| 81   | 0604933F        | ICBM FUZE MODERNIZATION .....                                | 73,512           |               | 73,512           |
| 82   | 0605213F        | F-22 MODERNIZATION INCREMENT 3.2B .....                      | 140,100          |               | 140,100          |
| 83   | 0605221F        | NEXT GENERATION AERIAL REFUELING AIRCRAFT .....              | 1,815,588        |               | 1,815,588        |
| 84   | 0605229F        | CSAR HH-60 RECAPITALIZATION .....                            | 123,210          |               | 123,210          |
| 85   | 0605278F        | HC/MC-130 RECAP RDT&E .....                                  | 19,039           |               | 19,039           |
| 86   | 0605931F        | B-2 DEFENSIVE MANAGEMENT SYSTEM .....                        | 281,056          |               | 281,056          |
| 87   | 0101125F        | NUCLEAR WEAPONS MODERNIZATION .....                          | 80,200           |               | 80,200           |
| 89   | 0207604F        | READINESS TRAINING RANGES, OPERATIONS AND MAINTENANCE .....  | 310              |               | 310              |
| 90   | 0207701F        | FULL COMBAT MISSION TRAINING .....                           | 14,861           |               | 14,861           |
| 91   | 0305230F        | MC-12 .....  | 19,949           |               | 19,949           |
| 92   | 0401138F        | C-27J AIRLIFT SQUADRONS .....                                |                  | 25,000        | 25,000           |
|      |                 | Joint Cargo Aircraft .....                                   |                  | [25,000]      |                  |
| 93   | 0401318F        | CV-22 .....  | 28,027           |               | 28,027           |
| 94   | 0401845F        | AIRBORNE SENIOR LEADER C3 (SLC3S) .....                      | 1,960            |               | 1,960            |
|      |                 | <b>SUBTOTAL SYSTEM DEVELOPMENT &amp; DEMONSTRATION .....</b> | <b>4,966,724</b> | <b>23,000</b> | <b>4,989,724</b> |
| 95   | 0604256F        | <b>RD&amp;E MANAGEMENT SUPPORT</b>                           |                  |               |                  |
|      |                 | THREAT SIMULATOR DEVELOPMENT .....                           | 22,812           |               | 22,812           |
| 96   | 0604759F        | MAJOR T&E INVESTMENT .....                                   | 42,236           |               | 42,236           |
| 97   | 0605101F        | RAND PROJECT AIR FORCE .....                                 | 25,579           |               | 25,579           |
| 99   | 0605712F        | INITIAL OPERATIONAL TEST & EVALUATION .....                  | 16,197           |               | 16,197           |
| 100  | 0605807F        | TEST AND EVALUATION SUPPORT .....                            | 722,071          |               | 722,071          |
| 101  | 0605860F        | ROCKET SYSTEMS LAUNCH PROGRAM (SPACE) .....                  | 16,200           |               | 16,200           |

|  |          |  |                  |               |                  |
|--|----------|--|------------------|---------------|------------------|
| 102                                    | 0605864F | SPACE TEST PROGRAM (STP) .....   | 10,051           | 34,950        | 45,001           |
|  |          | Program increase .....   |                  | [34,950]      |                  |
| 103                                    | 0605976F | FACILITIES RESTORATION AND MODERNIZATION—TEST AND EVALUATION SUPPORT ..... | 42,597           |               | 42,597           |
| 104                                    | 0605978F | FACILITIES SUSTAINMENT—TEST AND EVALUATION SUPPORT .....                   | 27,301           |               | 27,301           |
| 105                                    | 0606323F | MULTI-SERVICE SYSTEMS ENGINEERING INITIATIVE .....                         | 13,964           |               | 13,964           |
| 106                                    | 0606392F | SPACE AND MISSILE CENTER (SMC) CIVILIAN WORKFORCE .....                    | 203,766          |               | 203,766          |
| 107                                    | 0702806F | ACQUISITION AND MANAGEMENT SUPPORT .....                                   | 42,430           |               | 42,430           |
| 108                                    | 0804731F | GENERAL SKILL TRAINING .....   | 1,294            |               | 1,294            |
| 111                                    | 1001004F | INTERNATIONAL ACTIVITIES .....   | 3,851            |               | 3,851            |
|  |          | <b>SUBTOTAL RDT&amp;E MANAGEMENT SUPPORT .....</b>                         | <b>1,190,349</b> | <b>34,950</b> | <b>1,225,299</b> |
| <b>OPERATIONAL SYSTEMS DEVELOPMENT</b> |          |  |                  |               |                  |
| 112                                    | 0603423F | GLOBAL POSITIONING SYSTEM III—OPERATIONAL CONTROL SEGMENT .....            | 371,595          | -1,500        | 370,095          |
|  |          | Project decrease .....   |                  | [-1,500]      |                  |
| 114                                    | 0605018F | AF INTEGRATED PERSONNEL AND PAY SYSTEM (AF-IPPS) .....                     | 91,697           |               | 91,697           |
| 115                                    | 0605024F | ANTI-TAMPER TECHNOLOGY EXECUTIVE AGENCY .....                              | 17,037           |               | 17,037           |
| 117                                    | 0101113F | B-52 SQUADRONS .....   | 53,208           |               | 53,208           |
| 118                                    | 0101122F | AIR-LAUNCHED CRUISE MISSILE (ALCM) .....                                   | 431              |               | 431              |
| 119                                    | 0101126F | B-1B SQUADRONS .....   | 16,265           |               | 16,265           |
| 120                                    | 0101127F | B-2 SQUADRONS .....  | 35,970           |               | 35,970           |
| 121                                    | 0101313F | STRAT WAR PLANNING SYSTEM—USSTRATCOM .....                                 | 30,889           |               | 30,889           |
| 122                                    | 0101314F | NIGHT FIST—USSTRATCOM .....  | 10               |               | 10               |
| 124                                    | 0102326F | REGION/SECTOR OPERATION CONTROL CENTER MODERNIZATION PROGRAM .....         | 5,609            |               | 5,609            |
| 126                                    | 0203761F | WARFIGHTER RAPID ACQUISITION PROCESS (WRAP) RAPID TRANSITION FUND .....    | 15,098           |               | 15,098           |
| 127                                    | 0205219F | MQ-9 UAV .....   | 147,971          |               | 147,971          |
| 128                                    | 0207040F | MULTI-PLATFORM ELECTRONIC WARFARE EQUIPMENT .....                          | 49,848           |               | 49,848           |
| 129                                    | 0207131F | A-10 SQUADRONS .....   | 13,538           |               | 13,538           |
| 130                                    | 0207133F | F-16 SQUADRONS .....   | 190,257          |               | 190,257          |
| 131                                    | 0207134F | F-15E SQUADRONS .....  | 192,677          |               | 192,677          |
| 132                                    | 0207136F | MANNED DESTRUCTIVE SUPPRESSION .....                                       | 13,683           |               | 13,683           |
| 133                                    | 0207138F | F-22A SQUADRONS .....  | 371,667          |               | 371,667          |
| 134                                    | 0207142F | F-35 SQUADRONS .....   | 8,117            |               | 8,117            |

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| 135  | 0207161F        | TACTICAL AIM MISSILES .....                                  | 8,234           |              | 8,234            |
| 136  | 0207163F        | ADVANCED MEDIUM RANGE AIR-TO-AIR MISSILE (AMRAAM) .....      | 87,041          |              | 87,041           |
| 137  | 0207170F        | JOINT HELMET MOUNTED CUEING SYSTEM (JHMCS) .....             | 1,472           |              | 1,472            |
| 138  | 0207224F        | COMBAT RESCUE AND RECOVERY .....                             | 2,095           |              | 2,095            |
| 139  | 0207227F        | COMBAT RESCUE—PARARESCUE .....                               | 1,119           |              | 1,119            |
| 140  | 0207247F        | AF TENCAP .....  | 63,853          |              | 63,853           |
| 141  | 0207249F        | PRECISION ATTACK SYSTEMS PROCUREMENT .....                   | 1,063           |              | 1,063            |
| 142  | 0207253F        | COMPASS CALL .....   | 12,094          |              | 12,094           |
| 143  | 0207268F        | AIRCRAFT ENGINE COMPONENT IMPROVEMENT PROGRAM .....          | 187,984         |              | 187,984          |
| 145  | 0207325F        | JOINT AIR-TO-SURFACE STANDOFF MISSILE (JASSM) .....          | 7,950           |              | 7,950            |
| 146  | 0207410F        | AIR & SPACE OPERATIONS CENTER (AOC) .....                    | 76,315          |              | 76,315           |
| 147  | 0207412F        | CONTROL AND REPORTING CENTER (CRC) .....                     | 8,653           |              | 8,653            |
| 148  | 0207417F        | AIRBORNE WARNING AND CONTROL SYSTEM (AWACS) .....            | 65,200          |              | 65,200           |
| 149  | 0207418F        | TACTICAL AIRBORNE CONTROL SYSTEMS .....                      | 5,767           |              | 5,767            |
| 152  | 0207431F        | COMBAT AIR INTELLIGENCE SYSTEM ACTIVITIES .....              | 5,756           |              | 5,756            |
| 154  | 0207444F        | TACTICAL AIR CONTROL PARTY-MOD .....                         | 16,226          |              | 16,226           |
| 156  | 0207448F        | C2ISR TACTICAL DATA LINK .....                               | 1,633           |              | 1,633            |
| 157  | 0207449F        | COMMAND AND CONTROL (C2) CONSTELLATION .....                 | 18,086          |              | 18,086           |
| 158  | 0207452F        | DCAPEs .....   | 15,690          |              | 15,690           |
| 159  | 0207581F        | JOINT SURVEILLANCE/TARGET ATTACK RADAR SYSTEM (JSTARS) ..... | 24,241          |              | 24,241           |
| 160  | 0207590F        | SEEK EAGLE .....   | 22,654          |              | 22,654           |
| 161  | 0207601F        | USAF MODELING AND SIMULATION .....                           | 15,501          |              | 15,501           |
| 162  | 0207605F        | WARGAMING AND SIMULATION CENTERS .....                       | 5,699           |              | 5,699            |
| 163  | 0207697F        | DISTRIBUTED TRAINING AND EXERCISES .....                     | 4,425           |              | 4,425            |
| 164  | 0208006F        | MISSION PLANNING SYSTEMS .....                               | 69,377          |              | 69,377           |
| 165  | 0208021F        | INFORMATION WARFARE SUPPORT .....                            | 7,159           |              | 7,159            |
| 166  | 0208059F        | CYBER COMMAND ACTIVITIES .....                               | 66,888          |              | 66,888           |

|     |          |  |         |
|-----|----------|--|---------|
| 174 | 0301400F | SPACE SUPERIORITY INTELLIGENCE .....                                 | 12,056  |
| 175 | 0302015F | E-4B NATIONAL AIRBORNE OPERATIONS CENTER (NAOC) .....                | 4,159   |
| 176 | 0303131F | MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK (MEECN) .....     | 20,124  |
| 177 | 0303140F | INFORMATION SYSTEMS SECURITY PROGRAM .....                           | 69,133  |
| 178 | 0303141F | GLOBAL COMBAT SUPPORT SYSTEM .....                                   | 6,512   |
| 179 | 0303150F | GLOBAL COMMAND AND CONTROL SYSTEM .....                              | 4,316   |
| 180 | 0303601F | MILSATCOM TERMINALS .....  | 107,237 |
| 182 | 0304260F | AIRBORNE SIGINT ENTERPRISE .....                                     | 129,106 |
| 185 | 0305099F | GLOBAL AIR TRAFFIC MANAGEMENT (GATM) .....                           | 4,461   |
| 186 | 0305103F | CYBER SECURITY INITIATIVE .....                                      | 2,055   |
| 187 | 0305105F | DOD CYBER CRIME CENTER .....   | 285     |
| 188 | 0305110F | SATELLITE CONTROL NETWORK (SPACE) .....                              | 33,773  |
| 189 | 0305111F | WEATHER SERVICE .....  | 29,048  |
| 190 | 0305114F | AIR TRAFFIC CONTROL, APPROACH, AND LANDING SYSTEM (ATCAL) .....      | 43,187  |
| 191 | 0305116F | AERIAL TARGETS .....   | 50,496  |
| 194 | 0305128F | SECURITY AND INVESTIGATIVE ACTIVITIES .....                          | 354     |
| 195 | 0305145F | ARMS CONTROL IMPLEMENTATION .....                                    | 4,000   |
| 196 | 0305146F | DEFENSE JOINT COUNTERINTELLIGENCE ACTIVITIES .....                   | 342     |
| 198 | 0305164F | NAVSTAR GLOBAL POSITIONING SYSTEM (USER EQUIPMENT) (SPACE) .....     | 29,621  |
| 199 | 0305165F | NAVSTAR GLOBAL POSITIONING SYSTEM (SPACE AND CONTROL SEGMENTS) ..... | 14,335  |
| 201 | 0305173F | SPACE AND MISSILE TEST AND EVALUATION CENTER .....                   | 3,680   |
| 202 | 0305174F | SPACE INNOVATION AND DEVELOPMENT CENTER .....                        | 2,430   |
| 203 | 0305182F | SPACELIFT RANGE SYSTEM (SPACE) .....                                 | 8,760   |
| 205 | 0305202F | DRAGON U-2 .....   | 23,644  |
| 206 | 0305205F | ENDURANCE UNMANNED AERIAL VEHICLES .....                             | 21,000  |
| 207 | 0305206F | AIRBORNE RECONNAISSANCE SYSTEMS .....                                | 96,735  |
| 208 | 0305207F | MANNED RECONNAISSANCE SYSTEMS .....                                  | 13,316  |
| 209 | 0305208F | DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS .....                      | 63,501  |
| 210 | 0305219F | MQ-1 PREDATOR A UAV .....  | 9,122   |
| 211 | 0305220F | RQ-4 UAV .....   | 236,265 |
| 212 | 0305221F | NETWORK-CENTRIC COLLABORATIVE TARGETING .....                        | 7,367   |
| 213 | 0305236F | COMMON DATA LINK (CDL) .....   | 38,094  |

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| 214  | 0305238F        | NATO AGS .....                                    | 210,109         |              | 210,109          |
| 215  | 0305240F        | SUPPORT TO DCGS ENTERPRISE .....                  | 24,500          |              | 24,500           |
| 216  | 0305265F        | GPS III SPACE SEGMENT .....                       | 318,992         |              | 318,992          |
| 217  | 0305614F        | JSPOC MISSION SYSTEM .....                        | 54,645          |              | 54,645           |
| 218  | 0305881F        | RAPID CYBER ACQUISITION .....                     | 4,007           |              | 4,007            |
| 219  | 0305887F        | INTELLIGENCE SUPPORT TO INFORMATION WARFARE ..... | 13,357          |              | 13,357           |
| 220  | 0305913F        | NUDET DETECTION SYSTEM (SPACE) .....              | 64,965          |              | 64,965           |
| 221  | 0305940F        | SPACE SITUATION AWARENESS OPERATIONS .....        | 19,586          |              | 19,586           |
| 222  | 0308699F        | SHARED EARLY WARNING (SEW) .....                  | 1,175           |              | 1,175            |
| 224  | 0401115F        | C-130 AIRLIFT SQUADRON .....                      | 5,000           |              | 5,000            |
| 225  | 0401119F        | C-5 AIRLIFT SQUADRONS (IF) .....                  | 35,115          |              | 35,115           |
| 226  | 0401130F        | C-17 AIRCRAFT (IF) .....                          | 99,225          |              | 99,225           |
| 227  | 0401132F        | C-130J PROGRAM .....                              | 30,652          |              | 30,652           |
| 228  | 0401134F        | LARGE AIRCRAFT IR COUNTERMEASURES (LAIRCW) .....  | 7,758           |              | 7,758            |
| 229  | 0401139F        | LIGHT MOBILITY AIRCRAFT (LIMA) .....              | 100             |              | 100              |
| 231  | 0401219F        | KC-10S .....                                      | 24,022          |              | 24,022           |
| 232  | 0401314F        | OPERATIONAL SUPPORT AIRLIFT .....                 | 7,471           |              | 7,471            |
| 234  | 0408011F        | SPECIAL TACTICS/COMBAT CONTROL .....              | 4,984           |              | 4,984            |
| 235  | 0702207F        | DEPOT MAINTENANCE (NON-IF) .....                  | 1,588           |              | 1,588            |
| 236  | 0708012F        | LOGISTICS SUPPORT ACTIVITIES .....                | 577             |              | 577              |
| 237  | 0708610F        | LOGISTICS INFORMATION TECHNOLOGY (LOGIT) .....    | 119,327         |              | 119,327          |
| 238  | 0708611F        | SUPPORT SYSTEMS DEVELOPMENT .....                 | 15,873          |              | 15,873           |
| 240  | 0804743F        | OTHER FLIGHT TRAINING .....                       | 349             |              | 349              |
| 242  | 0808716F        | OTHER PERSONNEL ACTIVITIES .....                  | 117             |              | 117              |
| 243  | 0901202F        | JOINT PERSONNEL RECOVERY AGENCY .....             | 2,018           |              | 2,018            |
| 244  | 0901218F        | CIVILIAN COMPENSATION PROGRAM .....               | 1,561           |              | 1,561            |
| 245  | 0901220F        | PERSONNEL ADMINISTRATION .....                    | 7,634           |              | 7,634            |

|      |            |   |                   |               |                   |
|------|------------|---|-------------------|---------------|-------------------|
| 246  | 0901226F   | AIR FORCE STUDIES AND ANALYSIS AGENCY .....                               | 1,175             |               | 1,175             |
| 247  | 0901279F   | FACILITIES OPERATION—ADMINISTRATIVE .....                                 | 3,491             |               | 3,491             |
| 248  | 0901538F   | FINANCIAL MANAGEMENT INFORMATION SYSTEMS DEVELOPMENT .....                | 100,160           |               | 100,160           |
| 249A | 9999999999 | CLASSIFIED PROGRAMS .....   | 11,172,183        |               | 11,172,183        |
|      |            | <b>SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT .....</b>                     | <b>15,867,972</b> | <b>-1,500</b> | <b>15,866,472</b> |
|      |            | <b>TOTAL RESEARCH, DEVELOPMENT, TEST &amp; EVAL, AF .....</b>             | <b>25,428,046</b> | <b>84,950</b> | <b>25,512,996</b> |
|      |            | <b>RESEARCH, DEVELOPMENT, TEST &amp; EVAL, DW</b>                         |                   |               |                   |
|      |            | <b>BASIC RESEARCH</b>   |                   |               |                   |
| 1    | 06010008R  | DTRA BASIC RESEARCH INITIATIVE .....                                      | 45,071            |               | 45,071            |
| 2    | 0601101E   | DEFENSE RESEARCH SCIENCES .....   | 309,051           |               | 309,051           |
| 3    | 060111008Z | BASIC RESEARCH INITIATIVES .....  | 19,405            |               | 19,405            |
| 4    | 0601117E   | BASIC OPERATIONAL MEDICAL RESEARCH SCIENCE .....                          | 39,676            |               | 39,676            |
| 5    | 060112008Z | NATIONAL DEFENSE EDUCATION PROGRAM .....                                  | 87,979            |               | 87,979            |
| 6    | 0601384BP  | CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM .....                             | 50,566            |               | 50,566            |
|      |            | <b>SUBTOTAL BASIC RESEARCH .....</b>                                      | <b>551,748</b>    |               | <b>551,748</b>    |
|      |            | <b>APPLIED RESEARCH</b>   |                   |               |                   |
| 7    | 06020008Z  | JOINT MUNITIONS TECHNOLOGY .....  | 20,615            |               | 20,615            |
| 8    | 0602115E   | BIOMEDICAL TECHNOLOGY .....   | 110,900           |               | 110,900           |
| 9    | 06022808Z  | HISTORICALLY BLACK COLLEGES AND UNIVERSITIES (HBCU) SCIENCE .....         |                   | 10,000        | 10,000            |
|      |            | Program increase .....  |                   | [10,000]      |                   |
| 10   | 060223408Z | LINCOLN LABORATORY RESEARCH PROGRAM .....                                 | 36,826            |               | 36,826            |
| 11   | 060225008Z | SYSTEMS 2020 APPLIED RESEARCH .....                                       | 7,898             |               | 7,898             |
| 12   | 0602303E   | INFORMATION & COMMUNICATIONS TECHNOLOGY .....                             | 392,421           |               | 392,421           |
| 13   | 0602304E   | COGNITIVE COMPUTING SYSTEMS .....   | 30,424            |               | 30,424            |
| 15   | 0602383E   | BIOLOGICAL WARFARE DEFENSE .....  | 19,236            |               | 19,236            |
| 16   | 0602384BP  | CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM .....                             | 223,269           |               | 223,269           |
| 17   | 060266308Z | DATA TO DECISIONS APPLIED RESEARCH .....                                  | 13,753            |               | 13,753            |
| 18   | 060266808Z | CYBER SECURITY RESEARCH .....   | 18,985            |               | 18,985            |
| 19   | 060267008Z | HUMAN, SOCIAL AND CULTURE BEHAVIOR MODELING (HSCB) APPLIED RESEARCH ..... | 6,771             |               | 6,771             |

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| 20   | 060270ZE        | TACTICAL TECHNOLOGY .....   | 233,209          |               | 233,209          |
| 21   | 0602715E        | MATERIALS AND BIOLOGICAL TECHNOLOGY .....                                     | 166,067          |               | 166,067          |
| 22   | 0602716E        | ELECTRONICS TECHNOLOGY .....  | 222,416          |               | 222,416          |
| 23   | 06027188R       | WEAPONS OF MASS DESTRUCTION DEFEAT TECHNOLOGIES .....                         | 172,352          |               | 172,352          |
| 24   | 1160401BB       | SPECIAL OPERATIONS TECHNOLOGY DEVELOPMENT .....                               | 28,739           |               | 28,739           |
|      |                 | <b>SUBTOTAL APPLIED RESEARCH .....</b>  | <b>1,703,881</b> | <b>10,000</b> | <b>1,713,881</b> |
|      |                 | <b>ADVANCED TECHNOLOGY DEVELOPMENT (ATD)</b>                                  |                  |               |                  |
| 25   | 060300008Z      | JOINT MUNITIONS ADVANCED TECHNOLOGY .....                                     | 25,612           |               | 25,612           |
| 26   | 0603121D8Z      | SO/LIC ADVANCED DEVELOPMENT .....   | 26,324           |               | 26,324           |
| 27   | 0603122D8Z      | COMBATING TERRORISM TECHNOLOGY SUPPORT .....                                  | 77,144           |               | 77,144           |
| 28   | 0603160BR       | COUNTERPROLIFERATION INITIATIVES—PROLIFERATION PREVENTION AND DEFEAT .....    | 275,022          |               | 275,022          |
| 29   | 0603175C        | BALLISTIC MISSILE DEFENSE TECHNOLOGY .....                                    | 79,975           |               | 79,975           |
| 31   | 0603225D8Z      | JOINT DOD-DOE MUNITIONS TECHNOLOGY DEVELOPMENT .....                          | 20,032           |               | 20,032           |
| 32   | 0603264S        | AGILE TRANSPORTATION FOR THE 21ST CENTURY (AT21)—THEATER CAPABILITY .....     | 3,892            |               | 3,892            |
| 33   | 0603274C        | SPECIAL PROGRAM—MDA TECHNOLOGY .....  | 36,685           |               | 36,685           |
| 34   | 0603286E        | ADVANCED AEROSPACE SYSTEMS .....  | 174,316          |               | 149,316          |
|      |                 | Program decrease .....  |                  | -25,000       |                  |
| 35   | 0603287E        | SPACE PROGRAMS AND TECHNOLOGY .....   | 159,704          |               | 159,704          |
| 36   | 0603384BP       | CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM—ADVANCED DEVELOPMENT .....            | 234,280          |               | 234,280          |
| 37   | 0603618D8Z      | JOINT ELECTRONIC ADVANCED TECHNOLOGY .....                                    | 6,983            |               | 6,983            |
| 38   | 0603648D8Z      | JOINT CAPABILITY TECHNOLOGY DEMONSTRATIONS .....                              | 158,263          |               | 158,263          |
| 39   | 0603662D8Z      | NETWORKED COMMUNICATIONS CAPABILITIES .....                                   | 25,393           |               | 25,393           |
| 40   | 0603663D8Z      | DATA TO DECISIONS ADVANCED TECHNOLOGY DEVELOPMENT .....                       | 13,754           |               | 13,754           |
| 42   | 0603668D8Z      | CYBER SECURITY ADVANCED RESEARCH .....  | 19,935           |               | 19,935           |
| 43   | 0603670D8Z      | HUMAN, SOCIAL AND CULTURE BEHAVIOR MODELING (HSCB) ADVANCED DEVELOPMENT ..... | 8,235            |               | 8,235            |
| 44   | 0603680D8Z      | DEFENSE-WIDE MANUFACTURING SCIENCE AND TECHNOLOGY PROGRAM .....               | 21,966           |               | 21,966           |

|  |            |  |                  |                |                  |
|--|------------|--|------------------|----------------|------------------|
| 45   | 060369908Z | EMERGING CAPABILITIES TECHNOLOGY DEVELOPMENT .....                     | 24,662           |                | 24,662           |
| 47   | 0603712S   | GENERIC LOGISTICS R&D TECHNOLOGY DEMONSTRATIONS .....                  | 24,605           |                | 24,605           |
| 48   | 0603713S   | DEPLOYMENT AND DISTRIBUTION ENTERPRISE TECHNOLOGY .....                | 30,678           |                | 30,678           |
| 49   | 0603716D8Z | STRATEGIC ENVIRONMENTAL RESEARCH PROGRAM .....                         | 65,282           |                | 65,282           |
| 50   | 0603720S   | MICROELECTRONICS TECHNOLOGY DEVELOPMENT AND SUPPORT .....              | 72,234           | 10,000         | 82,234           |
|  |            | Program increase .....   |                  | [10,000]       |                  |
| 51   | 0603727D8Z | JOINT WARFIGHTING PROGRAM .....  | 8,403            |                | 8,403            |
| 52   | 0603739E   | ADVANCED ELECTRONICS TECHNOLOGIES .....                                | 111,008          |                | 111,008          |
| 54   | 0603760E   | COMMAND, CONTROL AND COMMUNICATIONS SYSTEMS .....                      | 237,859          | -25,000        | 212,859          |
|  |            | Program reduction .....  |                  | [-25,000]      |                  |
| 55   | 0603765E   | CLASSIFIED DARPA PROGRAMS .....  | 3,000            |                | 3,000            |
| 56   | 0603766E   | NETWORK-CENTRIC WARFARE TECHNOLOGY .....                               | 236,883          |                | 236,883          |
| 57   | 0603767E   | SENSOR TECHNOLOGY .....  | 299,438          |                | 299,438          |
| 58   | 0603769SE  | DISTRIBUTED LEARNING ADVANCED TECHNOLOGY DEVELOPMENT .....             | 12,195           |                | 12,195           |
| 59   | 0603781D8Z | SOFTWARE ENGINEERING INSTITUTE .....                                   | 30,036           |                | 30,036           |
| 60   | 0603826D8Z | QUICK REACTION SPECIAL PROJECTS .....                                  | 107,002          |                | 107,002          |
| 62   | 0603828J   | JOINT EXPERIMENTATION .....  | 21,230           |                | 21,230           |
| 63   | 0603832D8Z | DOD MODELING AND SIMULATION MANAGEMENT OFFICE .....                    | 47,433           |                | 47,433           |
| 64   | 0603901C   | DIRECTED ENERGY RESEARCH .....   | 46,944           | 30,000         | 76,944           |
|  |            | Program increase .....   |                  | [30,000]       |                  |
| 65   | 0603902C   | NEXT GENERATION AEGIS MISSILE .....                                    | 224,077          |                | 224,077          |
| 66   | 0603941D8Z | TEST & EVALUATION SCIENCE & TECHNOLOGY .....                           | 92,602           |                | 92,602           |
| 68   | 0604055D8Z | OPERATIONAL ENERGY CAPABILITY IMPROVEMENT .....                        | 26,244           |                | 26,244           |
| 69   | 0303310D8Z | CWMD SYSTEMS .....   | 53,946           |                | 53,946           |
| 70   | 1160402BB  | SPECIAL OPERATIONS ADVANCED TECHNOLOGY DEVELOPMENT .....               | 45,317           |                | 45,317           |
| 71   | 1160422BB  | AVIATION ENGINEERING ANALYSIS .....                                    | 861              |                | 861              |
| 72   | 1160472BB  | SOF INFORMATION AND BROADCAST SYSTEMS ADVANCED TECHNOLOGY .....        | 4,959            |                | 4,959            |
|  |            | <b>SUBTOTAL ADVANCED TECHNOLOGY DEVELOPMENT (ATD) .....</b>            | <b>3,194,413</b> | <b>-10,000</b> | <b>3,184,413</b> |
|  |            |  |                  |                |                  |
| <b>ADVANCED COMPONENT DEVELOPMENT &amp; PROTOTYPES</b> |            |  |                  |                |                  |
| 73   | 0603161D8Z | NUCLEAR AND CONVENTIONAL PHYSICAL SECURITY EQUIPMENT RDT&E ADC&P ..... | 33,234           |                | 33,234           |
| 74   | 0603527D8Z | RETRACT LARCH .....  | 21,023           |                | 21,023           |

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| 75   | 0603600D8Z      | WALKOFF .....   | 94,624          |              | 94,624           |
| 77   | 0603714D8Z      | ADVANCED SENSOR APPLICATIONS PROGRAM .....  | 16,958          |              | 16,958           |
| 78   | 0603851D8Z      | ENVIRONMENTAL SECURITY TECHNICAL CERTIFICATION PROGRAM .....                                | 75,941          |              | 75,941           |
| 79   | 0603881C        | BALLISTIC MISSILE DEFENSE TERMINAL DEFENSE SEGMENT .....                                    | 316,929         |              | 316,929          |
| 80   | 0603882C        | BALLISTIC MISSILE DEFENSE MIDCOURSE DEFENSE SEGMENT .....                                   | 903,172         | 460,000      | 1,363,172        |
|      |                 | East Coast site planning and development, and EIS work .....                                |                 | [103,000]    |                  |
|      |                 | Program increase .....  |                 | [357,000]    |                  |
| 81   | 0603884BP       | CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM—DEMAVAL .....                                       | 179,023         |              | 179,023          |
| 82   | 0603884C        | BALLISTIC MISSILE DEFENSE SENSORS .....   | 347,012         |              | 347,012          |
| 84   | 0603890C        | BMD ENABLING PROGRAMS .....   | 362,711         |              | 362,711          |
| 85   | 0603891C        | SPECIAL PROGRAMS—MDA .....  | 272,387         |              | 272,387          |
| 86   | 0603892C        | AEGIS BMD .....   | 992,407         |              | 992,407          |
| 87   | 0603893C        | SPACE TRACKING & SURVEILLANCE SYSTEM .....  | 51,313          |              | 51,313           |
| 88   | 0603895C        | BALLISTIC MISSILE DEFENSE SYSTEM SPACE PROGRAMS .....                                       | 6,912           |              | 6,912            |
| 89   | 0603896C        | BALLISTIC MISSILE DEFENSE COMMAND AND CONTROL, BATTLE MANAGEMENT & COMMUNICA-<br>TION ..... | 366,552         |              | 366,552          |
| 90   | 0603898C        | BALLISTIC MISSILE DEFENSE JOINT WARFIGHTER SUPPORT .....                                    | 55,550          |              | 55,550           |
| 91   | 0603904C        | MISSILE DEFENSE INTEGRATION & OPERATIONS CENTER (MDIOC) .....                               | 63,043          |              | 63,043           |
| 92   | 0603906C        | REGARDING TRENCH .....  | 11,371          |              | 11,371           |
| 93   | 0603907C        | SEA BASED X-BAND RADAR (SBX) .....  | 9,730           |              | 9,730            |
| 94   | 0603913C        | ISRAELI COOPERATIVE PROGRAMS .....  | 99,836          | 168,000      | 267,836          |
|      |                 | Increase to DWS, ASIP, Arrow-3 cooperative programs .....                                   |                 | [168,000]    |                  |
| 95   | 0603914C        | BALLISTIC MISSILE DEFENSE TEST .....  | 454,400         |              | 454,400          |
| 96   | 0603915C        | BALLISTIC MISSILE DEFENSE TARGETS .....   | 435,747         |              | 435,747          |
| 97   | 0603920D8Z      | HUMANITARIAN DEMINING .....   | 13,231          |              | 13,231           |
| 98   | 0603923D8Z      | COALITION WARFARE .....   | 11,398          |              | 11,398           |
| 99   | 0604016D8Z      | DEPARTMENT OF DEFENSE CORROSION PROGRAM .....   | 3,283           |              | 3,283            |

|     |            |   |                |                  |
|-----|------------|---|----------------|------------------|
| 100 | 060440008Z | DEPARTMENT OF DEFENSE (DOD) UNMANNED AIRCRAFT SYSTEM (UAS) COMMON DEVELOPMENT     | 12,368         | 12,368           |
| 101 | 060467008Z | HUMAN, SOCIAL AND CULTURE BEHAVIOR MODELING (HSCB) RESEARCH AND ENGINEERING ..... | 5,131          | 5,131            |
| 104 | 06047871   | JOINT SYSTEMS INTEGRATION .....   | 3,273          | 3,273            |
| 106 | 06048281   | JOINT FIRES INTEGRATION AND INTEROPERABILITY TEAM .....                           | 7,364          | 7,364            |
| 107 | 0604880C   | LAND-BASED SM-3 (LBSM3) .....   | 276,338        | 276,338          |
| 108 | 0604881C   | AEGIS SM-3 BLOCK IIA CO-DEVELOPMENT .....   | 420,630        | 420,630          |
| 109 | 0604883C   | PRECISION TRACKING SPACE SENSOR RDT&E .....                                       | 50,000         | 50,000           |
|     |            | Project decrease to support technology development .....                          | -247,375       | -247,375         |
| 111 | 0604886C   | ADVANCED REMOTE SENSOR TECHNOLOGY (ARST) .....                                    | 58,742         | 58,742           |
| 113 | 0303191D8Z | JOINT ELECTROMAGNETIC TECHNOLOGY (JET) PROGRAM .....                              | 3,158          | 3,158            |
|     |            | <b>SUBTOTAL ADVANCED COMPONENT DEVELOPMENT &amp; PROTOTYPES .....</b>             | <b>380,625</b> | <b>6,662,791</b> |
|     |            | <b>SYSTEM DEVELOPMENT AND DEMONSTRATION (SDD)</b>                                 |                |                  |
| 115 | 0604161D8Z | NUCLEAR AND CONVENTIONAL PHYSICAL SECURITY EQUIPMENT RDT&E SDD .....              | 6,817          | 6,817            |
| 116 | 0604165D8Z | PROMPT GLOBAL STRIKE CAPABILITY DEVELOPMENT .....                                 | 110,383        | 110,383          |
| 117 | 0604384BP  | CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM—EMD .....                                 | 311,071        | 311,071          |
| 119 | 0604764K   | ADVANCED IT SERVICES JOINT PROGRAM OFFICE (AITS-JPO) .....                        | 25,787         | 25,787           |
| 120 | 0604771D8Z | JOINT TACTICAL INFORMATION DISTRIBUTION SYSTEM (JTIDS) .....                      | 20,688         | 20,688           |
| 121 | 0605000BR  | WEAPONS OF MASS DESTRUCTION DEFEAT CAPABILITIES .....                             | 5,749          | 5,749            |
| 122 | 0605013BL  | INFORMATION TECHNOLOGY DEVELOPMENT .....  | 12,699         | 12,699           |
| 125 | 0605021SE  | HOMELAND PERSONNEL SECURITY INITIATIVE .....                                      | 387            | 387              |
| 126 | 0605020D8Z | DEFENSE EXPORTABILITY PROGRAM .....   | 1,859          | 1,859            |
| 127 | 0605027D8Z | OUSD(C) IT DEVELOPMENT INITIATIVES .....  | 7,010          | 7,010            |
| 128 | 0605070S   | DOD ENTERPRISE SYSTEMS DEVELOPMENT AND DEMONSTRATION .....                        | 133,104        | 133,104          |
| 129 | 0605075D8Z | DCMO POLICY AND INTEGRATION .....   | 25,269         | 25,269           |
| 131 | 0605210D8Z | DEFENSE-WIDE ELECTRONIC PROCUREMENT CAPABILITIES .....                            | 10,238         | 10,238           |
| 132 | 0303141K   | GLOBAL COMBAT SUPPORT SYSTEM .....  | 19,670         | 19,670           |
| 133 | 0305304D8Z | DOD ENTERPRISE ENERGY INFORMATION MANAGEMENT (E2IM) .....                         | 3,556          | 3,556            |
|     |            | <b>SUBTOTAL SYSTEM DEVELOPMENT AND DEMONSTRATION (SDD) .....</b>                  | <b>694,287</b> | <b>694,287</b>   |
|     |            | <b>RDT&amp;E MANAGEMENT SUPPORT</b>   |                |                  |
| 135 | 0604774D8Z | DEFENSE READINESS REPORTING SYSTEM (DRRS) .....                                   | 6,383          | 6,383            |

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| 136  | 0604875D8Z      | JOINT SYSTEMS ARCHITECTURE DEVELOPMENT .....                                     | 3,845           |              | 3,845            |
| 137  | 0604940D8Z      | CENTRAL TEST AND EVALUATION INVESTMENT DEVELOPMENT (CTEIP) .....                 | 144,109         |              | 144,109          |
| 138  | 0604942D8Z      | ASSESSMENTS AND EVALUATIONS .....  | 2,419           |              | 2,419            |
| 139  | 0604943D8Z      | THERMAL VICAR .....  | 8,214           |              | 8,214            |
| 140  | 0605100D8Z      | JOINT MISSION ENVIRONMENT TEST CAPABILITY (JMETS) .....                          | 19,380          |              | 19,380           |
| 141  | 0605104D8Z      | TECHNICAL STUDIES, SUPPORT AND ANALYSIS .....                                    | 32,266          |              | 32,266           |
| 142  | 0605110D8Z      | USD(A&T)—CRITICAL TECHNOLOGY SUPPORT .....                                       | 840             |              | 840              |
| 143  | 0605117D8Z      | FOREIGN MATERIEL ACQUISITION AND EXPLOITATION .....                              | 56,012          |              | 56,012           |
| 144  | 0605126I        | JOINT INTEGRATED AIR AND MISSILE DEFENSE ORGANIZATION (JIAMDO) .....             | 55,508          |              | 55,508           |
| 146  | 0605130D8Z      | FOREIGN COMPARATIVE TESTING .....  | 18,174          |              | 18,174           |
| 147  | 0605142D8Z      | SYSTEMS ENGINEERING .....  | 43,195          |              | 43,195           |
| 148  | 0605151D8Z      | STUDIES AND ANALYSIS SUPPORT—OSD .....   | 6,457           |              | 6,457            |
| 149  | 0605161D8Z      | NUCLEAR MATTERS-PHYSICAL SECURITY .....  | 4,901           |              | 4,901            |
| 150  | 0605170D8Z      | SUPPORT TO NETWORKS AND INFORMATION INTEGRATION .....                            | 6,307           |              | 6,307            |
| 151  | 0605200D8Z      | GENERAL SUPPORT TO USD (INTELLIGENCE) .....                                      | 6,601           |              | 6,601            |
| 152  | 0605384BP       | CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM .....                                    | 92,849          |              | 92,849           |
| 159  | 0605790D8Z      | SMALL BUSINESS INNOVATION RESEARCH (SBIR)/ SMALL BUSINESS TECHNOLOGY TRANSFER (S | 1,857           |              | 1,857            |
| 160  | 0605798D8Z      | DEFENSE TECHNOLOGY ANALYSIS .....  | 12,056          |              | 12,056           |
| 162  | 0605801KA       | DEFENSE TECHNICAL INFORMATION CENTER (DTIC) .....                                | 55,454          |              | 55,454           |
| 163  | 0605803SE       | R&D IN SUPPORT OF DOD ENLISTMENT, TESTING AND EVALUATION .....                   | 16,364          |              | 16,364           |
| 164  | 0605804D8Z      | DEVELOPMENT TEST AND EVALUATION .....  | 15,110          |              | 15,110           |
| 166  | 0605898E        | MANAGEMENT HQ—R&D .....  | 69,767          |              | 69,767           |
| 167  | 0606100D8Z      | BUDGET AND PROGRAM ASSESSMENTS .....   | 4,454           |              | 4,454            |
| 169  | 0203345D8Z      | DEFENSE OPERATIONS SECURITY INITIATIVE (DOSI) .....                              | 2,637           |              | 2,637            |
| 174  | 0303166I        | SUPPORT TO INFORMATION OPERATIONS (IO) CAPABILITIES .....                        | 8,238           |              | 8,238            |
| 176  | 0305103E        | CYBER SECURITY INITIATIVE .....  | 1,801           |              | 1,801            |
| 177  | 0305193D8Z      | INTELLIGENCE SUPPORT TO INFORMATION OPERATIONS (IO) .....                        | 16,041          |              | 16,041           |

|  |            |  |                |                |
|--|------------|--|----------------|----------------|
| 180                                    | 0804767D8Z | COCOM EXERCISE ENGAGEMENT AND TRAINING TRANSFORMATION (GE2T2)                    | 77,475         | 77,475         |
| 182                                    | 0901598C   | MANAGEMENT HQ—MDA  | 34,855         | 34,855         |
| 183                                    | 0901598D8W | MANAGEMENT HEADQUARTERS WHS  | 104            | 104            |
| 184A                                   | 9999999999 | CLASSIFIED PROGRAMS  | 64,255         | 64,255         |
|  |            | <b>SUBTOTAL RDT&amp;E MANAGEMENT SUPPORT</b>                                     | <b>887,928</b> | <b>887,928</b> |
| <b>OPERATIONAL SYSTEMS DEVELOPMENT</b> |            |  |                |                |
| 185                                    | 0604130V   | ENTERPRISE SECURITY SYSTEM (ESS)   | 8,866          | 8,866          |
| 186                                    | 0605127T   | REGIONAL INTERNATIONAL OUTREACH (RIO) AND PARTNERSHIP FOR PEACE INFORMATION MGMT | 3,238          | 3,238          |
| 187                                    | 0605147I   | OVERSEAS HUMANITARIAN ASSISTANCE SHARED INFORMATION SYSTEM (OHASIS)              | 288            | 288            |
| 188                                    | 0607384BP  | CHEMICAL AND BIOLOGICAL DEFENSE (OPERATIONAL SYSTEMS DEVELOPMENT)                | 14,745         | 14,745         |
| 190                                    | 0607828J   | JOINT INTEGRATION AND INTEROPERABILITY   | 5,013          | 5,013          |
| 191                                    | 0208043J   | PLANNING AND DECISION AID SYSTEM (PDAS)  | 3,922          | 3,922          |
| 192                                    | 0208045K   | C4I INTEROPERABILITY   | 72,574         | 72,574         |
| 194                                    | 0301144K   | JOINT/ALLIED COALITION INFORMATION SHARING                                       | 6,214          | 6,214          |
| 201                                    | 0302016K   | NATIONAL MILITARY COMMAND SYSTEM-WIDE SUPPORT                                    | 499            | 499            |
| 202                                    | 0302019K   | DEFENSE INFO INFRASTRUCTURE ENGINEERING AND INTEGRATION                          | 14,498         | 14,498         |
| 203                                    | 0303126K   | LONG-HAUL COMMUNICATIONS—DCS   | 26,164         | 26,164         |
| 204                                    | 0303131K   | MINIMUM ESSENTIAL EMERGENCY COMMUNICATIONS NETWORK (MEECN)                       | 12,931         | 12,931         |
| 205                                    | 0303135G   | PUBLIC KEY INFRASTRUCTURE (PKI)  | 6,296          | 6,296          |
| 206                                    | 0303136G   | KEY MANAGEMENT INFRASTRUCTURE (KMI)  | 30,948         | 30,948         |
| 207                                    | 0303140D8Z | INFORMATION SYSTEMS SECURITY PROGRAM   | 11,780         | 11,780         |
| 208                                    | 0303140G   | INFORMATION SYSTEMS SECURITY PROGRAM   | 191,452        | 191,452        |
|  |            | Program increase   | 50,000         | 50,000         |
|  |            | GLOBAL COMMAND AND CONTROL SYSTEM  | [50,000]       | [50,000]       |
| 211                                    | 0303150K   | Program increase   | 10,000         | 10,000         |
|  |            | DEFENSE SPECTRUM ORGANIZATION  | [10,000]       | [10,000]       |
| 212                                    | 0303153K   | DEFENSE SPECTRUM ORGANIZATION  | 24,278         | 24,278         |
| 213                                    | 0303170K   | NET-CENTRIC ENTERPRISE SERVICES (NCES)   | 2,924          | 2,924          |
| 214                                    | 0303260D8Z | DEFENSE MILITARY DECEPTION PROGRAM OFFICE (DMDPO)                                | 1,294          | 1,294          |
| 215                                    | 0303610K   | TELEPORT PROGRAM   | 6,050          | 6,050          |
| 217                                    | 0304210BB  | SPECIAL APPLICATIONS FOR CONTINGENCIES   | 17,058         | 17,058         |
| 222                                    | 0305103K   | CYBER SECURITY INITIATIVE  | 4,189          | 4,189          |

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| 223  | 0305125D8Z      | CRITICAL INFRASTRUCTURE PROTECTION (CIP)                 | 10,462          |              | 10,462           |
| 227  | 0305186D8Z      | POLICY R&D PROGRAMS                                      | 6,360           |              | 6,360            |
| 229  | 0305199D8Z      | NET CENTRICITY   | 21,190          |              | 21,190           |
| 232  | 03052088B       | DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS                | 7,114           | 600          | 7,714            |
|      |                 | Program increase   |                 | [600]        |                  |
| 235  | 0305208K        | DISTRIBUTED COMMON GROUND/SURFACE SYSTEMS                | 3,247           |              | 3,247            |
| 237  | 03052198B       | MQ-1 PREDATOR A UAV                                      | 1,355           |              | 1,355            |
| 240  | 0305387D8Z      | HOMELAND DEFENSE TECHNOLOGY TRANSFER PROGRAM             | 2,303           |              | 2,303            |
| 241  | 0305600D8Z      | INTERNATIONAL INTELLIGENCE TECHNOLOGY AND ARCHITECTURES  | 1,478           |              | 1,478            |
| 249  | 0708011S        | INDUSTRIAL PREPAREDNESS                                  | 27,044          |              | 27,044           |
| 250  | 0708012S        | LOGISTICS SUPPORT ACTIVITIES                             | 4,711           |              | 4,711            |
| 251  | 0902298J        | MANAGEMENT HQ—OJCS                                       | 4,100           |              | 4,100            |
| 253  | 11052198B       | MQ-9 UAV   | 3,002           |              | 3,002            |
| 257  | 11604038B       | SPECIAL OPERATIONS AVIATION SYSTEMS ADVANCED DEVELOPMENT | 97,267          |              | 97,267           |
| 258  | 11604048B       | SPECIAL OPERATIONS TACTICAL SYSTEMS DEVELOPMENT          | 821             |              | 821              |
| 259  | 11604058B       | SPECIAL OPERATIONS INTELLIGENCE SYSTEMS DEVELOPMENT      | 25,935          |              | 25,935           |
| 260  | 11604088B       | SOF OPERATIONAL ENHANCEMENTS                             | 51,700          |              | 51,700           |
| 261  | 11604218B       | SPECIAL OPERATIONS CV-22 DEVELOPMENT                     | 1,822           |              | 1,822            |
| 262  | 11604278B       | MISSION TRAINING AND PREPARATION SYSTEMS (MTPS)          | 10,131          |              | 10,131           |
| 263  | 11604298B       | AC/MC-130J   | 19,647          |              | 19,647           |
| 264  | 11604748B       | SOF COMMUNICATIONS EQUIPMENT AND ELECTRONICS SYSTEMS     | 2,225           |              | 2,225            |
| 265  | 11604768B       | SOF TACTICAL RADIO SYSTEMS                               | 3,036           |              | 3,036            |
| 266  | 11604778B       | SOF WEAPONS SYSTEMS                                      | 1,511           |              | 1,511            |
| 267  | 11604788B       | SOF SOLDIER PROTECTION AND SURVIVAL SYSTEMS              | 4,263           |              | 4,263            |
| 268  | 11604798B       | SOF VISUAL AUGMENTATION, LASERS AND SENSOR SYSTEMS       | 4,448           |              | 4,448            |
| 269  | 11604808B       | SOF TACTICAL VEHICLES                                    | 11,325          |              | 11,325           |
| 270  | 11604818B       | SOF MUNITIONS  | 1,515           |              | 1,515            |

|      |            |  |                   |                |                   |
|------|------------|--|-------------------|----------------|-------------------|
| 271  | 1160482BB  | SOF ROTARY WING AVIATION .....   | 24,430            |                | 24,430            |
| 272  | 1160483BB  | SOF UNDERWATER SYSTEMS .....   | 26,405            | 35,000         | 61,405            |
|      |            | Program increase .....   |                   | [35,000]       |                   |
| 273  | 1160484BB  | SOF SURFACE CRAFT .....  | 8,573             |                | 8,573             |
| 275  | 1160489BB  | SOF GLOBAL VIDEO SURVEILLANCE ACTIVITIES .....                           | 7,620             |                | 7,620             |
| 276  | 1160490BB  | SOF OPERATIONAL ENHANCEMENTS INTELLIGENCE .....                          | 16,386            |                | 16,386            |
| 276A | 9999999999 | CLASSIFIED PROGRAMS .....  | 3,754,516         | 19,900         | 3,774,416         |
|      |            | Program increases .....  |                   | [19,900]       |                   |
|      |            | <b>SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT .....</b>                    | <b>4,667,738</b>  | <b>115,500</b> | <b>4,783,238</b>  |
|      |            | <b>TOTAL RESEARCH, DEVELOPMENT, TEST &amp; EVAL, DW .....</b>            | <b>17,982,161</b> | <b>496,125</b> | <b>18,478,286</b> |
|      |            | <b>OPERATIONAL TEST &amp; EVAL, DEFENSE</b>                              |                   |                |                   |
|      |            | <b>RD&amp;E MANAGEMENT SUPPORT</b>                                       |                   |                |                   |
| 1    | 06051180TE | OPERATIONAL TEST AND EVALUATION .....                                    | 72,501            | 35,000         | 107,501           |
|      |            | Program increase for DOT&E cyber—range operations .....                  |                   | [25,000]       |                   |
|      |            | Program increase for DOT&E cyber—threat development and assessment ..... |                   | [10,000]       |                   |
| 2    | 06051310TE | LIVE FIRE TEST AND EVALUATION .....                                      | 49,201            |                | 49,201            |
| 3    | 06058140TE | OPERATIONAL TEST ACTIVITIES AND ANALYSES .....                           | 63,566            |                | 63,566            |
|      |            | <b>SUBTOTAL RD&amp;E MANAGEMENT SUPPORT .....</b>                        | <b>185,268</b>    | <b>35,000</b>  | <b>220,268</b>    |
|      |            | <b>TOTAL OPERATIONAL TEST &amp; EVAL, DEFENSE .....</b>                  | <b>185,268</b>    | <b>35,000</b>  | <b>220,268</b>    |
|      |            | <b>TOTAL RD&amp;E .....</b>  | <b>69,407,767</b> | <b>979,489</b> | <b>70,387,256</b> |

**SEC. 4202. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION FOR OVERSEAS CONTINGENCY OPERATIONS.**

**SEC. 4202. RESEARCH, DEVELOPMENT, TEST, AND EVALUATION FOR OVERSEAS CONTINGENCY OPERATIONS**  
(In Thousands of Dollars)

| Line | Program Element | Item  | FY 2013 Request | House Change | House Authorized |
|------|-----------------|---|-----------------|--------------|------------------|
|      |                 | <b>ADVANCED COMPONENT DEVELOPMENT &amp; PROTOTYPES</b>                |                 |              |                  |
| 60   | 0603747A        | SOLDIER SUPPORT AND SURVIVABILITY .....                               | 19,860          |              | 19,860           |
|      |                 | <b>SUBTOTAL ADVANCED COMPONENT DEVELOPMENT &amp; PROTOTYPES</b> ..... | <b>19,860</b>   |              | <b>19,860</b>    |
|      |                 | <b>TOTAL RESEARCH, DEVELOPMENT, TEST &amp; EVAL, ARMY</b> .....       | <b>19,860</b>   |              | <b>19,860</b>    |
|      |                 | <b>ADVANCED COMPONENT DEVELOPMENT &amp; PROTOTYPES</b>                |                 |              |                  |
| 56   | 0603654N        | JOINT SERVICE EXPLOSIVE ORDNANCE DEVELOPMENT .....                    | 4,600           |              | 4,600            |
|      |                 | <b>SUBTOTAL ADVANCED COMPONENT DEVELOPMENT &amp; PROTOTYPES</b> ..... | <b>4,600</b>    |              | <b>4,600</b>     |
|      |                 | <b>SYSTEM DEVELOPMENT &amp; DEMONSTRATION</b>                         |                 |              |                  |
| 131  | 0604771N        | MEDICAL DEVELOPMENT .....   | 2,173           |              | 2,173            |
|      |                 | <b>SUBTOTAL SYSTEM DEVELOPMENT &amp; DEMONSTRATION</b> .....          | <b>2,173</b>    |              | <b>2,173</b>     |
|      |                 | <b>RD&amp;E MANAGEMENT SUPPORT</b>                                    |                 |              |                  |
| 160  | 0605866N        | NAVY SPACE AND ELECTRONIC WARFARE (SEW) SUPPORT .....                 | 5,200           |              | 5,200            |
|      |                 | <b>SUBTOTAL RD&amp;E MANAGEMENT SUPPORT</b> .....                     | <b>5,200</b>    |              | <b>5,200</b>     |
|      |                 | <b>OPERATIONAL SYSTEMS DEVELOPMENT</b>                                |                 |              |                  |
| 195  | 0206624M        | MARINE CORPS COMBAT SERVICES SUPPORT .....                            | 6,762           |              | 6,762            |
| 221  | 0305233N        | RQ-7 UAV .....  | 7,600           |              | 7,600            |
| 230A | 9999999999      | CLASSIFIED PROGRAMS .....   | 33,784          |              | 33,784           |
|      |                 | <b>SUBTOTAL OPERATIONAL SYSTEMS DEVELOPMENT</b> .....                 | <b>48,146</b>   |              | <b>48,146</b>    |

