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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2017 Office of the Secretary Of Defense **Date:** February 2016

<b>Appropriation/Budget Activity</b>					<b>R-1 Program Element (Number/Name)</b>							
0400: <i>Research, Development, Test &amp; Evaluation, Defense-Wide I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>					PE 0604250D8Z I <i>Advanced Innovative Technologies</i>							
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	125.811	170.872	468.881	844.870	-	844.870	544.547	345.708	110.300	0.000	Continuing	Continuing
P250: <i>Advanced Innovative Technologies</i>	125.811	170.872	468.881	844.870	-	844.870	544.547	345.708	110.300	0.000	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

The Strategic Capabilities Office (SCO) identifies, analyzes, demonstrates, and transitions game-changing applications of existing and near-term technology (and other U.S. Government capabilities) to shape and counter emerging threats. Currently focused on the Asia-Pacific Rebalance, SCO combines capability innovation with concepts of operation and information management to develop novel concepts often crossing Service, Defense-Intelligence, and multi-classification divides. This helps to solve critical national security challenges in partnership with the Services, Defense Agencies, Combatant Commands (COCOMS), Joint Chiefs of Staff, Intelligence Community, and the Office of the Secretary of Defense (OSD). SCO analyzes, demonstrates, and red-teams these concepts on an accelerated time frame to enable subsequent programmatic decisions on alternative capabilities that have greater mission impact and lower cost.

The Advanced Innovative Technologies Program Element (PE) contains projects that include in-depth analysis to determine technical and operational performance and risk, component and subsystem-level prototyping and testing to reduce risk, and operational demonstrations to prove concept viability prior to subsequent programmatic decisions. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	174.752	469.798	422.206	-	422.206
Current President's Budget	170.872	468.881	844.870	-	844.870
Total Adjustments	-3.880	-0.917	422.664	-	422.664
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-3.812	-			
• Other Internal Baseline Adjustment	-	-	433.618	-	433.618
• FY15 Reprog. for Cancelled Account	-0.068	-	-	-	-
• FFRDC Reduction	-	-0.917	-	-	-
• Efficiency Reductions	-	-	-7.723	-	-7.723
• Economic Assumptions	-	-	-3.231	-	-3.231

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**Appropriation/Budget Activity**  
0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 4:  
*Advanced Component Development & Prototypes (ACD&P)*

**R-1 Program Element (Number/Name)**  
PE 0604250D8Z / *Advanced Innovative Technologies*

**Change Summary Explanation**

Funding decreases were used to pay for higher priority DoD Bills.

This update reflects continued project funding in FY 2017 for six SCO projects: Land-Based Rail Gun (LBRG) and Land-Based and Sea-Based Powder Guns, Advanced Navigation, Enhanced Munitions, Sea Dragon, Unmanned Aerial Vehicle Payloads, and Sea Mob.

The FY 2017 funding request includes reduction of \$18.770 million to account for the availability of prior year execution balances.

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Office of the Secretary Of Defense										<b>Date:</b> February 2016		
<b>Appropriation/Budget Activity</b> 0400 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0604250D8Z / <i>Advanced Innovative Technologies</i>				<b>Project (Number/Name)</b> P250 / <i>Advanced Innovative Technologies</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
P250: <i>Advanced Innovative Technologies</i>	125.811	170.872	468.881	844.870	-	844.870	544.547	345.708	110.300	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The Strategic Capabilities Office (SCO) identifies, analyzes, demonstrates, and transitions game-changing applications of existing and near-term technology (and other U.S. Government capabilities) to shape and counter emerging threats. Currently focused on the Asia-Pacific Rebalance, SCO combines capability innovation with concepts of operation and information management to develop novel concepts often crossing Service, Defense-Intelligence, and multi-classification divides. SCO helps to solve critical national security challenges in partnership with the Services, Defense Agencies, Combatant Commands (COCOMS), Joint Chiefs of Staff, Intelligence Community, and the Office of the Secretary of Defense (OSD). SCO analyzes, demonstrates, and red-teams these concepts on an accelerated time frame to enable subsequent programmatic decisions on alternative capabilities that have greater mission impact and lower cost.

The Advanced Innovative Technologies Program Element (PE) contains projects that include in-depth analysis to determine technical and operational performance and risk, component and subsystem-level prototyping and testing to reduce risk, and operational demonstrations to prove concept viability prior to subsequent programmatic decisions. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.

**B. Accomplishments/Planned Programs (\$ in Millions)**

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<b>Title:</b> Hypervelocity Gun Weapon System (HGWS)	95.447	268.711	246.070
<p><b>Description:</b> The title of “Land-and-Sea-Based Powder Guns”, has been changed to “Hypervelocity Gun Weapon System” because base defense solutions developed under this PE can be applied to multiple guns and gun types launching the Hypervelocity Projectile. Cost-effective, large magazine base defense will be demonstrated by closing the fire control loop between existing sensors and prototype projectiles launched from existing powder guns including the Navy’s Mk-45 five inch Naval gun and the Army’s Paladin 155 mm self-propelled howitzer; advanced powder gun prototypes; and the electromagnetic railgun. To facilitate this, the program will integrate guns, projectile, and sensor so that projectiles may be command guided during a series of flight tests. These tests will verify performance and lethality results from modeling and simulation. Testing will conclude by demonstrating projectile fly-out and control, sensor tracking of projectiles, communication from sensor to projectile, integrated guidance, navigation and control, culminating in FY 2016 live-fire, closed-loop launches high velocity, and live-fire tests against live targets in FY 2017. The intended end-state is a prototype system that retires risks to allow transition of gun based defense to partners: the Missile Defense Agency, the Navy, and, or the Army.</p> <p><b>FY 2015 Accomplishments:</b></p>			

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**B. Accomplishments/Planned Programs (\$ in Millions)**

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<ul style="list-style-type: none"> <li>• Successfully fired three prototype projectiles from Mk-45 powder gun to test inertial measurement units and data link under development by Sandia National Laboratories.</li> <li>• Conducted hardware in the loop test of proof-of-principle fire control radars and began integration with fire control.</li> <li>• Completed a Railgun prototype mount analysis of alternatives review and mount conceptual design review with BAE.</li> <li>• Tested launch survivability of projectile, including data link from 32 MJ Railgun.</li> <li>• Took delivery of two proof-of-principle fire control radars and started testing and integration at Potomac River Test Range.</li> <li>• Initiated Powder Gun Acceleration effort with U.S. Army to integrate High Velocity Projectile (HVP) into and conduct closed loop fire control tests with existing and developmental artillery guns.</li> <li>• Initiated Super Powder Gun effort with U.S. Army to achieve higher muzzle velocities than existing artillery guns.</li> <li>• Accelerated BAE hypervelocity projectile development and testing.</li> <li>• Initiated parallel projectile risk reduction and advanced projectile design initiatives to broaden industry base.</li> <li>• Completed fire control system requirements review, Demonstration Objectives Review and System Concept and Design Review to support FY 2016 tests.</li> <li>• Modified Mk-160 software and integrate data link to enable closed loop fire control for testing of prototype projectiles.</li> <li>• Investigated and tested alternative lethality methods.</li> <li>• Completed informal preliminary and critical design review for GD-OTS control actuator system.</li> <li>• Developed notional (National Security Agency (NSA) requirements pending) security module design and built 30 for gun hardening and system integration.</li> <li>• Characterized government designed inertial measurement units under representative environmental conditions.</li> <li>• Delivered Mk 99 propellant, interior ballistic modeling support, and validated models with flight test.</li> <li>• Delivered ground data link for fire control hardware integration.</li> <li>• Completed informal system requirements and function review for BAE tail-kit.</li> <li>• Began formal security module certification process with NSA and completed information assurance requirements review.</li> </ul> <p><b>FY 2016 Plans:</b></p> <ul style="list-style-type: none"> <li>• Conduct initial live-fire projectile launch from Army 155 mm powder gun.</li> <li>• Conduct a control actuation system test from high velocity guns.</li> <li>• Test maneuvering projectile capabilities in hardware-in-the-loop at Johns Hopkins University Applied Research Lab (JHU/APL) and gun live-fire demonstrations at White Sands Missile Range (WSMR).</li> <li>• Conduct closed-loop live-fire testing at high velocity launch against synthetic targets.</li> <li>• Conduct High Velocity Projectile (HVP) launch from U.S. Army artillery guns with optimized charge and verify HVP component survivability and communication.</li> <li>• Continue parallel projectile risk reduction and advanced projectile design initiatives and down select to advanced designs for further development.</li> </ul>			

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<ul style="list-style-type: none"> <li>• Continue prototype fire control sensor development with Georgia Tech Research Institute (GTRI) to support closed loop fire control tests beginning in FY 2018.</li> <li>• Begin procurement of prototype fire control sensor hardware and begin integration for live fire testing beginning in FY 2018.</li> <li>• Begin procurement of surveillance sensor hardware and begin integration for live fire testing beginning in FY 2018.</li> <li>• Begin procurement of targets to be used in FY 2017 and FY 2018 tests.</li> <li>• Support projectile testing for HGWS tests with equipment and facilities at WSMR.</li> <li>• Continue Powder Gun Acceleration effort with U.S. Army.</li> <li>• Continue Super Powder Gun effort with U.S.</li> <li>• Complete concept of operations analysis for powder gun defense with Army and Navy transition partners.</li> <li>• Continue system requirements document and system design document to support live fire testing beginning in FY 2017.</li> <li>• Evolve projectile data link to revised interfaces, including tactical data link frequency bands.</li> <li>• Continue to work security module certification with the NSA through preliminary design review and support integration and testing with 73 security modules.</li> <li>• Continue to provide Mk 99 propellant for flight tests.</li> <li>• Build government-designed projectiles for FY 2016 and FY 2017 testing.</li> <li>• Continue to anchor Naval Surface Warfare Center - Dahlgren, Division (NSWCDD), Missile and Space Intelligence Center (MSIC), and JHU/APL models and simulations with test data.</li> </ul> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Demonstrate lethality of High Velocity Projectile (HVP) kinetic warhead.</li> <li>• Use Hardware in the Loop at JHU/APL to test closed loop system performance.</li> <li>• Conduct initial closed-loop live-fire testing against surrogate threat.</li> <li>• Conduct prototype fire control sensor Critical Design Review (CDR) with Georgia Tech Research Institute (GTRI).</li> <li>• Continue procurement of prototype fire control sensor hardware and begin integration for live fire testing beginning in FY 2018.</li> <li>• Continue procurement of surveillance sensor hardware and begin integration for live fire testing beginning in FY 2018.</li> <li>• Continue parallel projectile risk reduction and advanced projectile design initiatives and down select to an advanced design for flight test.</li> <li>• Continue system requirements document and system design document to support live fire testing.</li> <li>• Conduct site development activities at Pacific test site.</li> <li>• Continue procurement of test targets for live fire testing beginning in FY 2018.</li> <li>• Continue to anchor NSWC/DD, MSIC, and JHU/APL models and simulations with test data.</li> </ul>				
<b>Title:</b> Assured Tactical C2 (ATC2)		29.280	14.473	-

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<p><b>Description:</b> Leverage existing technologies to analyze and demonstrate an alternative Tactical Command and Control solution for contested environments. Project will apply existing Department of Defense (DoD) investments in novel ways to increase tactical command and control reliability in contested environments. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level. This project will transition to services in FY 2017.</p> <p><b>FY 2015 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Conducted design reviews and operational technology exchanges to incorporate Army, Air Force, and Navy tactical cloud requirements into an integrated, secure, assured capability.</li> <li>• Acquired hardware, software, and test design solutions and evaluate components in a trusted environment.</li> <li>• Began design and prototyping for subsequent proof-of-principle demonstrations by leveraging existing commercial cloud technology and techniques to enhance Services, cloud development and integrate into development baselines.</li> <li>• Began development of enhanced security and vulnerability assessments.</li> <li>• Completed baseline version 1.0 of Tactical Cloud Reference Implementation to be used in FY 2016 demonstration.</li> </ul> <p><b>FY 2016 Plans:</b></p> <ul style="list-style-type: none"> <li>• Continue further development of enhanced security and vulnerability assessments.</li> <li>• Unify the various tactical Service clouds into an integrated, secure, and assured operational environment that provides reliable communications and robust security for the tactical warfighter.</li> <li>• Demonstrate tactical cloud capabilities at Trident Warrior 16.</li> </ul>			
<p><b>Title:</b> Advanced Navigation</p> <p><b>Description:</b> Leverage existing technologies to analyze and demonstrate a prototype advanced navigation technique for contested environments. Projects will 1) develop a capability to create software that enables Global Positioning System (GPS)-free navigation of multiple weapon platforms; and 2) demonstrate capability for Small Diameter Bomb (SDB)-I to perform in a GPS-contested/denied environment to near GPS accuracy. If this capability works then COCOMs will be able to use the GPS-dependent SDB-I in a GPS-denied environment.</p> <p><b>FY 2015 Accomplishments:</b></p> <p>FY 2015 accomplishments included design, prototyping, data collections, and tests. Test results used to anchor modeling and simulation performance results and develop operationally-relevant proof-of-principle demonstrations.</p> <ul style="list-style-type: none"> <li>• Analyzed options for mounting a sky-ward looking camera for navigation.</li> <li>• Purchased prototype hardware, performed integration analysis of existing unmanned platform and conducted ground tests of commercial off the shelf cameras.</li> </ul>	15.909	16.474	3.350

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<ul style="list-style-type: none"> <li>• Modeled and analyzed sensor size, accuracy, detection range, and sensitivity to object brightness; determined day and nighttime sensor performance.</li> <li>• Developed design concepts for form/fit replacement for LN-120G.</li> <li>• Developed a plan to integrate GPS-free navigation capability into the Small Diameter Bomb (SDB)-I.</li> <li>• Analyzed navigation accuracy and risks of a SDB-I using a non-GPS, image-based navigation technique.</li> </ul> <p><b>FY 2016 Plans:</b> Advanced Navigation Common Capability Demonstration:</p> <ul style="list-style-type: none"> <li>• Define software development requirements and preliminary software design.</li> <li>• Evaluate software – hardware compatibility in a captive carry flight test.</li> </ul> <p>Small Diameter Bomb-I Demonstration:</p> <ul style="list-style-type: none"> <li>• Model image-based navigation performance.</li> <li>• Model SDB-I performance when using image-based navigation.</li> <li>• Define system requirements and preliminary system design.</li> <li>• Begin test planning for demonstrations in FY 2017.</li> <li>• Define the interface between image-based navigation software and SDB-I sensor hardware.</li> <li>• Order four Guided Test Vehicles (GTVs) (inert bombs used for test) to be dropped in FY 2017 demonstrations.</li> <li>• Build two of six image-based navigation software updates.</li> <li>• Test SDB-I sensor hardware in captive-carry test.</li> </ul> <p><b>FY 2017 Plans:</b> Advanced Navigation Common Capability Demonstration:</p> <ul style="list-style-type: none"> <li>• Determine baseline design of software development tools, flight software, and flight hardware.</li> <li>• Conduct captive-carry flight test of baseline hardware and software.</li> <li>• Conduct captive-carry system flight demonstration.</li> </ul> <p>Small Diameter Bomb-I Demonstration:</p> <ul style="list-style-type: none"> <li>• Build remaining four of six image-based navigation software updates.</li> <li>• Conduct functional qualification testing of hardware and software for flight test.</li> <li>• Test SDB-I sensor hardware and navigation software in captive-carry test.</li> <li>• Drop three guided test vehicles (SDB-I configured for testing) to demonstrate weapon accuracy using sensor hardware and navigation software.</li> </ul>				
<b>Title:</b> Intelligence, Surveillance, and Reconnaissance (ISR) Denial		19.787	19.470	-

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<p><b>Description:</b> Leverage existing technologies to analyze and demonstrate a prototype solution to disrupt enemy targeting of critical U.S. assets. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level. This project will transition to the Navy in FY 2017.</p> <p><b>FY 2015 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Initiated collaboration across DoD laboratories on potential ISR denial solutions.</li> <li>• Identified trade space between different technical approaches.</li> <li>• Completed ISR Critical Design Review (CDR).</li> <li>• Purchased and integrated hardware which supports CDR design.</li> <li>• Conducted modeling and simulation analysis of potential solutions to better understand performance and potential trade-offs for development decisions and Concept of Operations (CONOPS).</li> <li>• Performed initial testing of the system to validate system performance.</li> <li>• Began work on modeling and simulation efforts to better inform CONOPS development.</li> <li>• Began preliminary efforts to ensure integration with related efforts.</li> </ul> <p><b>FY 2016 Plans:</b></p> <ul style="list-style-type: none"> <li>• Purchase and integrate hardware which supports Critical Design Review (CDR) design.</li> <li>• Conduct modeling and simulation analysis of potential solutions to better understand performance and potential trade-offs for development decisions and Concept of Operations (CONOPS).</li> <li>• Complete integration of individual subsystems.</li> <li>• Conduct system testing to validate performance.</li> <li>• Conduct sea based testing on USS EISENHOWER (CVN-69) during flight operations.</li> <li>• Initiate development of training program in support of 2017 Navy transition.</li> </ul>			
<p><b>Title:</b> Enhanced Munitions</p> <p><b>Description:</b> Leverage existing technologies to analyze and prototype enhancements to current munitions. As existing munitions age, leveraging advanced technology may enhance or buy-back performance, this project will retire risks associated with transition of enhanced munitions. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.</p> <p><b>FY 2015 Accomplishments:</b></p> <ul style="list-style-type: none"> <li>• Conducted system modeling, simulation, and prototype performance trades.</li> <li>• Performed analysis and subsystem testing to develop operationally-relevant proof-of-principle demonstrations.</li> <li>• Pursued target component modeling, simulation, and vulnerability testing.</li> </ul>	10.449	23.474	41.960

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<ul style="list-style-type: none"> <li>• Verified target component vulnerability and anchor component models.</li> <li>• Developed target engagement requirements.</li> <li>• Initiated design and build of surrogate target.</li> </ul> <p><b>FY 2016 Plans:</b></p> <ul style="list-style-type: none"> <li>• Complete a Preliminary Design Review (PDR) and down select from multiple prototype designs.</li> <li>• Build a prototype (size, weight, and power constrained) for enhanced munitions.</li> <li>• Integrate components into a target surrogate and perform vulnerability testing to anchor models and simulations.</li> <li>• Test prototype capability against target surrogate to verify effectiveness.</li> </ul> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Complete a Critical Design Review (CDR).</li> <li>• Build and test form factor enhancement article.</li> <li>• Integrate enhancement into munitions test article.</li> <li>• Finalize Critical Experiment flight test plan.</li> </ul>				
<p><b>Title:</b> Sea Dragon</p> <p><b>Description:</b> A cost-effective disruptive offensive capability will be demonstrated by integrating an existing weapon system with an existing Navy platform. Project includes analysis, prototyping, and experimentation. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.</p> <p><b>FY 2016 Plans:</b></p> <ul style="list-style-type: none"> <li>• Complete Phase Zero Analysis and Planning.</li> <li>• Complete Phase One Development and Land Based Testing (LBT).</li> <li>• Begin Phase Two Underwater Static Testing (UST).</li> <li>• Analyze off-board targeting options to close operationally relevant kill chains.</li> <li>• Prepare test facilities and weapon firing ranges for subsequent testing.</li> <li>• Identify and analyze alternative targeting methods to enable down select and follow on demonstrations.</li> <li>• Procure long lead range test articles.</li> <li>• Initiate planning to demonstrate use of various targeting methods.</li> <li>• Continue detailed studies on platform, fire control and weapon integration and interoperability in support of future end to end demonstration (FY 2020).</li> <li>• Begin studies on platform, fire control and weapon integration and interoperability in support of future tactical system.</li> <li>• Continue to reduce time latency from sensor to shooter for off board targeting.</li> </ul> <p><b>FY 2017 Plans:</b></p>		-	81.114	70.760

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<ul style="list-style-type: none"> <li>• Complete Phase Two Underwater Static Testing.</li> <li>• Start Phase Three Underwater Translational Testing (UTT) to include:</li> <li>• Complete analysis of off-board targeting options to close operationally relevant kill chains.</li> <li>• Prepare test facilities and weapon firing ranges for subsequent testing.</li> <li>• Identify and analyze alternative targeting methods to enable down select and follow on demonstrations.</li> <li>• Conduct hardware-in-the-loop sub-system kill chain testing.</li> <li>• Continue procurement of long lead range test articles.</li> <li>• Initiate planning to demonstrate use of various targeting methods.</li> <li>• Refine studies on platform, fire control and weapon integration and interoperability in support of Phase Four End to End Demonstration (FY 2019).</li> </ul>			
<p><b>Title:</b> Unmanned Aerial Vehicle Payloads</p> <p><b>Description:</b> SCO will leverage existing low-cost payloads by demonstrating autonomous swarming behavior of a large number of Unmanned Aerial Vehicles (UAVs) (e.g. micro-UAVs) as well as focused upgrades of the low cost Miniature Air-Launched Decoy (MALD) platform (MALD-X). This project seeks to demonstrate the operational effectiveness and tactical advantage provided by large numbers of collaborative, expendable platforms. Effectiveness analysis and prototyping of these payloads will be conducted, with initial demonstrations planned in FY 2016 completing with final free flight demonstrations of the MALD-X prior to potential transition to a program of record. This project was funded in FY 2015 within the Advanced Innovative Analysis and Concepts Program Element 0603289D8Z under the Low-Cost Payloads project. Due to the nature of some of these projects, specific applications and detailed plans are available at a higher classification level.</p> <p><b>FY 2016 Plans:</b></p> <ul style="list-style-type: none"> <li>• Conduct Micro-UAV Swarm demonstration.</li> <li>• Complete MALD-X critical design review.</li> <li>• Conduct initial prototype subsystem testing.</li> <li>• Anchor modeling and simulations and update operational effectiveness assessment.</li> </ul> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Conduct platform/vehicle level ground testing.</li> <li>• Conduct vehicle level Captive Carry Flight Testing.</li> <li>• Build, integrate and checkout flight test vehicles.</li> <li>• Complete flight test demonstrations.</li> <li>• Update modeling and simulations based on completed testing and update operational effectiveness assessment.</li> </ul>	-	25.065	26.230

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<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604250D8Z / <i>Advanced Innovative Technologies</i>	<b>Project (Number/Name)</b> P250 / <i>Advanced Innovative Technologies</i>		
<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<ul style="list-style-type: none"> <li>• Complete prototype development and testing in partnership with service program offices to speed transition to a program of record.</li> </ul>				
<p><b>Title:</b> Sea Mob</p> <p><b>Description:</b> SCO, in partnership with the Office of Naval Research (ONR), is developing a group of Unmanned Surface Vehicles (USVs) capable of cooperative swarming behaviors. This project will demonstrate the ability to generate common situational awareness among USVs and conduct coordinated dynamic planning required for sustaining cooperative behaviors. Sea Mob and ONR are working closely together on USV swarm development activities, building on a series of successively more complex demonstrations planned over the next several years to advance the capabilities and prove utility of swarming USVs for multiple missions. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.</p> <p><b>FY 2016 Plans:</b></p> <ul style="list-style-type: none"> <li>• Demonstrate long range autonomy for one USV to verify range and the robustness of hardware and software in an open ocean environment.</li> <li>• Work with ONR to refine algorithms for contact fusion, dynamic planning and task execution of cooperative behaviors of USVs.</li> <li>• Acquire, install, integrate and test swarm subsystems on five USVs, including sensors, navigation, communications, and autonomy.</li> <li>• Plan for more complex cooperative behavior demonstrations that include additional sensors, more robust navigation, and reliable communications.</li> </ul> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Integrate and test swarm subsystems on five USVs, including sensors, navigation, communications, and autonomy.</li> <li>• Demonstrate a tactical mission using a swarm of five USVs that includes long range transit while sensing, fusing and avoiding contacts and hazards.</li> <li>• Analyze and develop USV swarm tactics, techniques and procedures for specified, complex missions.</li> <li>• Acquire, install, integrate and test swarm subsystems on additional USVs, including sensors, navigation, communications, and autonomy.</li> <li>• Develop the capability to deliver a large swarm of USVs and initiate swarm behaviors from forward locations, including open ocean.</li> <li>• Develop and test cooperative behaviors among larger USV swarms to conduct complex missions, such as autonomous search and identification, human-in-the-loop decision making, and delivery of advanced payloads.</li> </ul>		-	20.100	18.120
<p><b>Title:</b> Command and Control of the Information Environment</p> <p><b>Description:</b> The Command and Control of the Information Environment (C2IE) project provides Combatant Commands, Services, Agencies, and Department of Defense leadership the ability to detect, monitor, understand, and act in the information</p>		-	-	31.880

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<p>environment. The C2IE project leverages commercial and other existing software tools to enable dynamic understanding of the information environment. C2IE will improve the warfighters ability to sense, understand, and visualize the information environment, and collaboratively plan and execute activities that contribute to U.S. Government shaping efforts. Due to the nature of this project, specific applications and detailed plans are available at a higher classification level. The Command and Control of the Information Environment project transitions in FY 2017 from the Advanced Innovative Analysis and Concepts Program Element (PE) 0603289D8Z.</p> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Demonstrate near real time analysis of unclassified data sources on a single platform.</li> <li>• Complete initial assessment of performance for four analytic components.</li> <li>• Complete initial installation/demonstration of C2IE components on two SIPR networks.</li> <li>• Perform developmental, operational, and interface testing of C2IE software.</li> <li>• Initiate development of Tactics Techniques &amp; Procedures (TTP) for use of developed analytics.</li> <li>• Continue incremental SW development of information Common Operational Picture (iCOP), and Situational Awareness (SA) components of C2IE.</li> <li>• Conduct multiple validation demonstrations and workshops for various Combatant Commanders (CCMDs).</li> <li>• Initiate assessment of C2IE integration into GCCS-J/GCCS-J future.</li> </ul>			
<p><b>Title:</b> Alternative Strike</p> <p><b>Description:</b> The Alternative Strike demonstration integrates existing weapons, launch platforms, and command and control structures in novel ways to quickly provide the Combatant Commanders with critical multi-mission capabilities. This project will demonstrate the feasibility and utility of launching existing/modified weapons from existing launch platforms. This project will retire risks associated with cross platform integration to enable transition of new weapon/system combinations to service partners. System design and long-lead acquisition will be initiated in FY 2017, leading to subsequent demonstrations in FY 2018 through FY 2020. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.</p> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Complete a Preliminary Design Review (PDR) for platform integration and down select from multiple prototype designs.</li> <li>• Conduct aerodynamic modeling and simulation of weapon release and fly out.</li> <li>• Conduct detailed design of launch platform modifications for weapon integration.</li> <li>• Conduct detailed design of weapon modifications for new mission.</li> <li>• Design communications architecture for weapons targeting and in-flight support.</li> <li>• Finalize test plan for FY 2018 through FY 2020 testing.</li> </ul>	-	-	198.030

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Office of the Secretary Of Defense		<b>Date:</b> February 2016
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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<ul style="list-style-type: none"> <li>• Complete a Critical Design Review (CDR) of entire weapon/platform/communications design.</li> </ul>			
<p><b>Title:</b> Strike-Ex</p> <p><b>Description:</b> The Strike-Ex project leverages existing strike capabilities and develops alternative Concepts of Employment (CONEMP) and Tactics, Techniques, and Procedures (TTP) to deliver near-term innovative strike capabilities to Combatant Commanders. Due to the nature of this project, specific applications and detailed plans are available at a higher classification level. The Strike-Ex project is expected to transition to the Advanced Innovative Technologies Program Element (PE) 0604250D8Z in FY 2017.</p> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Conduct detailed design and systems engineering activities in support of system architecture, hardware design and platform integration requirements.</li> <li>• Conduct platform integration test exercises to collect performance data to validate CONOPS and identify risks.</li> <li>• Procure test article hardware to support component level testing and integration.</li> <li>• Initiate fabrication of Strike-Ex test articles to facilitate platform integration evaluations.</li> <li>• Conduct site development activities at White Sands Missile Range.</li> <li>• Develop Interface Control Documents (ICD) to manage integration of systems within Strike-Ex and integration on host platforms.</li> </ul>	-	-	121.720
<p><b>Title:</b> Third Eye</p> <p><b>Description:</b> Third Eye is a data architecture that leverages existing and emerging sensors to provide real-time tracking and targeting for multi-Service strike weapons. The project will enhance tracking against hard targets in denied environments and maintain ability to securely communicate with these sensors in real-time. SCO will integrate Third Eye-participating sensors with existing Service architectures to provide a low-cost, survivable real-time tracking and targeting capability to supplement existing sensors. Due to the classified nature of this project, specific applications and detailed plans are available at a higher classification level. Transition effort from SCO Advanced Innovative Analysis and Concepts Program Element (PE) 0603289D8Z.</p> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Conduct four spirals of Clutch Shot targeting demonstrations with new sensor capabilities.</li> <li>• Complete low latency fusion algorithms development.</li> <li>• Finalize analysis of new sensor data types for improved data fusion.</li> <li>• Complete build and in-field testing of a special collections sensor.</li> <li>• Complete Upstream Data Fusion (UDF) development and conduct demonstrations/evaluations of improved timeliness.</li> <li>• Complete Clutch Shot architecture development.</li> <li>• Develop updates to Mission Planning for Weapons/Tactical Employment guides for using new off board sensors.</li> </ul>	-	-	33.810

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<b>B. Accomplishments/Planned Programs (\$ in Millions)</b>		<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<ul style="list-style-type: none"> <li>• Augment service's experimentation with Third Eye capabilities.</li> <li>• Conduct integration and testing of Third Eye capabilities into additional services processing and dissemination systems.</li> </ul>				
<p><b>Title:</b> Sea Stalker</p> <p><b>Description:</b> SCO will leverage existing low cost, persistent maritime platforms to offer Combatant Commanders (CCMDs) deterrence options during a crisis. The Sea Stalker project seeks to retire the risk of platform and payload integration to provide an immediate, flexible capability. The project includes modeling, analysis, prototyping, and testing. The intended end-state is a prototype system that retires all risks necessary to allow transition to Navy partners. This project is currently funded within the Advanced Innovative Analysis and Concepts Program Element 0603289D8Z and will transition to the Advanced Innovative Technologies Program Element 0604250D8Z in FY 2017. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.</p> <p><b>FY 2017 Plans:</b></p> <ul style="list-style-type: none"> <li>• Manufacture and test integrated platform/payload systems.</li> <li>• Develop command and control algorithms and power management plan necessary for operation.</li> <li>• Perform platform testing in operationally relevant scenarios.</li> <li>• Test payload design and quantify effectiveness against mission goals.</li> <li>• Continue detailed concept of operation analysis.</li> </ul>		-	-	17.390
<p><b>Title:</b> MK-48 Heavyweight Torpedo Prototyping</p> <p><b>Description:</b> SCO will prototype and test MK-48 Heavyweight Torpedo Prototypes including modular payloads, communications, and advanced propulsion concepts.</p> <p><b>FY 2017 Plans:</b></p> <p>SCO will prototype and test MK-48 Heavyweight Torpedo Prototypes to include:</p> <ul style="list-style-type: none"> <li>• modular payloads</li> <li>• communications</li> <li>• advanced propulsion concepts.</li> </ul>		-	-	35.550
<b>Accomplishments/Planned Programs Subtotals</b>		170.872	468.881	844.870
<b>C. Other Program Funding Summary (\$ in Millions)</b>				
N/A				
<b>Remarks</b>				

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Office of the Secretary Of Defense		<b>Date:</b> February 2016
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**D. Acquisition Strategy**

N/A

**E. Performance Metrics**

Performance metrics are specific to each of the SCO efforts funded under the Advanced Innovative Technologies Program Element. All of which include measures identified in the management approach, Statement of Work (SOW) and Period of Performance (POP). In addition, completions and successes are monitored against schedules and deliverables stated in the initiative's management approach. Due to the nature of these projects, specific applications and detailed plans are available at a higher classification level.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Office of the Secretary Of Defense** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604250D8Z / <i>Advanced Innovative Technologies</i>	<b>Project (Number/Name)</b> P250 / <i>Advanced Innovative Technologies</i>
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<b>Product Development (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Hypervelocity Gun Weapon System (HGWS)	IA	Sandia : NM	3.822	1.572	Mar 2015	4.687	Oct 2015	4.496		-		4.496	-	-	-
Hypervelocity Gun Weapon System (HGWS)	MIPR	SOSSEC : NJ	42.029	26.099	Jan 2015	16.330	Oct 2015	7.284		-		7.284	-	-	-
Hypervelocity Gun Weapon System (HGWS)	MIPR	DOTC : NJ	19.326	22.283	Feb 2015	42.812	Oct 2015	26.180		-		26.180	-	-	-
Hypervelocity Gun Weapon System (HGWS)	MIPR	PEO IWS 7.0 : VA	-	16.849	Mar 2015	26.163	Oct 2015	87.392		-		87.392	-	-	-
Hypervelocity Gun Weapon System (HGWS)	MIPR	MDA / GTRI : AL, GA	18.388	6.288	Jan 2015	8.000		50.856		-		50.856	-	-	-
Hypervelocity Gun Weapon System (HGWS)	MIPR	MDA / Parsons : AL, VA	16.528	1.048		52.509		1.575		-		1.575	-	-	-
Hypervelocity Gun Weapon System (HGWS)	MIPR	US ARMY : Various	4.373	10.048	Jan 2015	17.250	Oct 2015	42.093		-		42.093	-	-	-
Hypervelocity Gun Weapon System (HGWS)	MIPR	Defense Microelectronics Activity (DMEA) : Various	20.843	11.260	Jan 2015	1.430	Oct 2015	24.838		-		24.838	-	-	-
Hypervelocity Gun Weapon System (HGWS)	MIPR	Air Force Life Management Center (AFLCMC) - Hanscom AFB, Massachusetts Institute of Technology / Lincoln Laboratory (MIT / LL) : MA	0.502	-		53.475	Oct 2015	1.356		-		1.356	-	-	-
Hypervelocity Gun Weapon System (HGWS)	MIPR	NAVSEA , Johns Hopkins Advanced Research Laboratory : DC, MD	-	-		9.364		-		-		-	-	-	-
<b>Subtotal</b>			125.811	95.447		232.020		246.070		-		246.070	-	-	-

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Office of the Secretary Of Defense** **Date:** February 2016

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<b>Test and Evaluation (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Assured Tactical C2	MIPR	ONR, NRL, AFRL, ARL : DMV	-	29.280	Oct 2014	14.473	Oct 2015	-		-		-	-	-	-
Advanced Navigation	MIPR	MIT/LL : MA	-	1.600	Oct 2014	-		-		-		-	-	-	-
Advanced Navigation Software Development	MIPR	MIT/LL : MA	-	1.400	Apr 2015	-		-		-		-	-	-	-
Advanced Navigation	MIPR	AFLMC : FL	-	12.909	Feb 2015	16.359	Oct 2015	3.350		-		3.350	-	-	-
Intelligence, Surveillance, and Reconnaissance (ISR) Denial	MIPR	JHU/APL : MD	-	19.787	Oct 2014	19.470	Oct 2015	-		-		-	-	-	-
Enhanced Munitions	MIPR	MSIC, MDA : AL, VA	-	10.449	Nov 2014	23.474	Oct 2015	41.960		-		41.960	-	-	-
Sea Dragon	MIPR	IWS, NAVSEA, NUWC, SPAWAR, NAVAIR & JHU/ APL : Various	-	-		81.000	Oct 2015	70.760		-		70.760	-	-	-
Unmanned Aerial Vehicle Payloads	MIPR	MIT/LL, SSC Pacific, NAWCWD : Various	-	-		24.033	Oct 2015	26.230		-		26.230	-	-	-
Sea Mob	MIPR	NSWC/CCD, NSWC/ PCD, JHU/APL, PSU/ARL, JPL : Various	-	-		19.985	Oct 2015	18.120		-		18.120	-	-	-
Command and Control of the Information Environment	MIPR	Army Research Laboratory : MD	-	-		-		31.880		-		31.880	-	-	-
Alternative Strike	MIPR	John Hopkins University / Advanced Physics Lab) (JHU/APL) : MD	-	-		-		198.030		-		198.030	-	-	-
Strike-Ex	MIPR	U. S. Army Aviation and Missile Research Development and Engineering Center (AMRDEC) & Naval	-	-		-		121.720		-		121.720	-	-	-

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**Exhibit R-3, RDT&E Project Cost Analysis:** PB 2017 Office of the Secretary Of Defense **Date:** February 2016

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<b>Test and Evaluation (\$ in Millions)</b>				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
		Surface Warfare Center, Carderock Division (NSWCCD) : AL & MD													
Third Eye	MIPR	Naval Systems Management Activity (NSMA), Naval Research Laboratory - NRL : DC, MA, VA	-	-		-		33.810		-		33.810	-	-	-
Sea Stalker	MIPR	Various : TBD	-	-		-		17.390		-		17.390	-	-	-
MK-48 Heavyweight Torpedo Prototyping	MIPR	Various : TBD	-	-		-		35.550		-		35.550	-	-	-
Hypervelocity Gun Weapon System (HGWS)	MIPR	SOSSEC : NJ	-	-		20.699		-		-		-	-	-	-
Hypervelocity Gun Weapon System (HGWS)	MIPR	Naval Surface Warfare Center Port Hueneme Division (NSWC PHD), WSMR : CA	-	-		13.053		-		-		-	-	-	-
Hypervelocity Gun Weapon System (HGWS)	MIPR	NSWCDD : Dahlgren, VA	-	-		4.315		-		-		-	-	-	-
<b>Subtotal</b>			-	75.425		236.861		598.800		-		598.800	-	-	-

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	125.811	170.872	468.881	844.870	-	844.870	-	-	-

**Remarks**



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**Exhibit R-4, RDT&E Schedule Profile:** PB 2017 Office of the Secretary Of Defense **Date:** February 2016

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	FY 2008				FY 2009				FY 2010				FY 2011				FY 2012				FY 2013				FY 2014			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Railgun Payload Dispense																												
<b><i>Railgun Prototype Mount PDR</i></b>																												
Railgun Prototype Mount PDR																												
<b><i>Railgun Proof-of-Principle Fire Control Sensors</i></b>																												
Railgun Proof-of-Principle Fire Control Sensors																												
<b><i>Railgun Track Maneuvering Projectile</i></b>																												
Railgun Track Maneuvering Projectile																												
<b><i>Railgun Test System at WSMR</i></b>																												
Install Railgun Test System at WSMR																												
<b><i>ATC2: Integrate Service Clouds</i></b>																												
Integrate Service Clouds																												
<b><i>ATC2: Advanced Security Enabled</i></b>																												
Advanced Security Enabled																												
<b><i>ATC2: Red Teaming</i></b>																												
Red Teaming																												
<b><i>Advanced Navigation USAF Contract Award</i></b>																												
USAF Contract Award																												
<b><i>Advanced Navigation Weapons Drop Tests</i></b>																												
Weapons Drop Tests																												
<b><i>ISR Denial Complete CDR</i></b>																												
Complete CDR																												
<b><i>ISR Denial Initial Systems Test</i></b>																												
Initial Systems Test																												
<b><i>ISR Denial Fleet Demonstration</i></b>																												

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2017 Office of the Secretary Of Defense **Date:** February 2016

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	FY 2008				FY 2009				FY 2010				FY 2011				FY 2012				FY 2013				FY 2014			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Fleet Demonstration																												
<b>Enhanced Munitions Complete PDR</b>																												
Complete PDR																												
<b>Enhanced Munitions Complete CDR</b>																												
Complete CDR																												
<b>Sea Dragon Initial Launch Demonstration</b>																												
Initial Launch Demonstration																												
<b>Sea Dragon Follow-on Launch Demonstration</b>																												
Follow-on Launch Demonstration																												
<b>Unmanned Aerial Vehicle Payloads CDR</b>																												
CDR																												
<b>Unmanned Aerial Vehicle Payloads Swarming Demo</b>																												
Swarming Demo																												
<b>Sea Mob Single Vehicle Autonomy at Extended Range</b>																												
Single Vehicle Autonomy at Extended Range																												
<b>Sea Mob Simple Cooperative Behavior</b>																												
Simple Cooperative Behavior																												
<b>Sea Mob Complex Cooperative Behavior</b>																												
Complex Cooperative Behavior																												

	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Railgun Command Projectile Maneuvers</b>																												

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2017 Office of the Secretary Of Defense **Date:** February 2016

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	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Railgun Command Projectile Maneuvers					■																							
<b><i>Railgun Airframe Flight</i></b>																												
Railgun Airframe Flight																												
<b><i>Railgun Prototype Mount CDR</i></b>																												
Railgun Prototype Mount CDR							■																					
<b><i>Railgun SRD</i></b>																												
Railgun SRD							■																					
<b><i>Railgun Install Tracker Hardware and Track Projectile</i></b>																												
Install Railgun Tracker Hardware and Track Projectile																												
<b><i>Railgun Decision to proceed with Prototype Testing</i></b>																												
Decision to proceed w/ Railgun Prototype Testing												■																
<b><i>Railgun Install Multisensor Hardware/Track Projectile</i></b>																												
Install Railgun Multisensor Hardware/Track Projectile																												
<b><i>Railgun Guidance and Control Demonstration</i></b>																												
Railgun Guidance and Control Demonstration			■																									
<b><i>Railgun SDD</i></b>																												
Railgun SDD												■																
<b><i>Railgun Payload Dispense</i></b>																												
Railgun Payload Dispense				■																								
<b><i>Railgun Prototype Mount PDR</i></b>																												

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2017 Office of the Secretary Of Defense **Date:** February 2016

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	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Railgun Prototype Mount PDR			■																									
<b><i>Railgun Proof-of-Principle Fire Control Sensors</i></b>																												
Railgun Proof-of-Principle Fire Control Sensors				■																								
<b><i>Railgun Track Maneuvering Projectile</i></b>																												
Railgun Track Maneuvering Projectile					■																							
<b><i>Railgun Test System at WSMR</i></b>																												
Install Railgun Test System at WSMR						■																						
<b><i>ATC2: Integrate Service Clouds</i></b>																												
Integrate Service Clouds				■																								
<b><i>ATC2: Advanced Security Enabled</i></b>																												
Advanced Security Enabled					■																							
<b><i>ATC2: Red Teaming</i></b>																												
Red Teaming						■																						
<b><i>Advanced Navigation USAF Contract Award</i></b>																												
USAF Contract Award				■																								
<b><i>Advanced Navigation Weapons Drop Tests</i></b>																												
Weapons Drop Tests								■																				
<b><i>ISR Denial Complete CDR</i></b>																												
Complete CDR			■																									
<b><i>ISR Denial Initial Systems Test</i></b>																												
Initial Systems Test				■																								
<b><i>ISR Denial Fleet Demonstration</i></b>																												
Fleet Demonstration							■																					
<b><i>Enhanced Munitions Complete PDR</i></b>																												

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**Exhibit R-4, RDT&E Schedule Profile:** PB 2017 Office of the Secretary Of Defense **Date:** February 2016

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604250D8Z / <i>Advanced Innovative Technologies</i>	<b>Project (Number/Name)</b> P250 / <i>Advanced Innovative Technologies</i>
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	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Complete PDR				■																								
<b><i>Enhanced Munitions Complete CDR</i></b>																												
Complete CDR								■																				
<b><i>Sea Dragon Initial Launch Demonstration</i></b>																												
Initial Launch Demonstration								■																				
<b><i>Sea Dragon Follow-on Launch Demonstration</i></b>																												
Follow-on Launch Demonstration								■																				
<b><i>Unmanned Aerial Vehicle Payloads CDR</i></b>																												
CDR								■																				
<b><i>Unmanned Aerial Vehicle Payloads Swarming Demo</i></b>																												
Swarming Demo								■																				
<b><i>Sea Mob Single Vehicle Autonomy at Extended Range</i></b>																												
Single Vehicle Autonomy at Extended Range				■																								
<b><i>Sea Mob Simple Cooperative Behavior</i></b>																												
Simple Cooperative Behavior								■																				
<b><i>Sea Mob Complex Cooperative Behavior</i></b>																												
Complex Cooperative Behavior												■																

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Office of the Secretary Of Defense		<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604250D8Z / <i>Advanced Innovative Technologies</i>	<b>Project (Number/Name)</b> P250 / <i>Advanced Innovative Technologies</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Railgun Command Projectile Maneuvers</i></b>				
Railgun Command Projectile Maneuvers	2	2016	2	2016
<b><i>Railgun Airframe Flight</i></b>				
Railgun Airframe Flight	1	2014	1	2014
<b><i>Railgun Prototype Mount CDR</i></b>				
Railgun Prototype Mount CDR	3	2016	3	2016
<b><i>Railgun SRD</i></b>				
Railgun SRD	3	2016	3	2016
<b><i>Railgun Install Tracker Hardware and Track Projectile</i></b>				
Install Railgun Tracker Hardware and Track Projectile	1	2014	1	2014
<b><i>Railgun Decision to proceed with Prototype Testing</i></b>				
Decision to proceed w/ Railgun Prototype Testing	4	2016	4	2016
<b><i>Railgun Install Multisensor Hardware/Track Projectile</i></b>				
Install Railgun Multisensor Hardware/Track Projectile	4	2014	4	2014
<b><i>Railgun Guidance and Control Demonstration</i></b>				
Railgun Guidance and Control Demonstration	3	2015	3	2015
<b><i>Railgun SDD</i></b>				
Railgun SDD	4	2016	4	2016
<b><i>Railgun Payload Dispense</i></b>				
Railgun Payload Dispense	4	2015	4	2015
<b><i>Railgun Prototype Mount PDR</i></b>				
Railgun Prototype Mount PDR	3	2015	3	2015

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2017 Office of the Secretary Of Defense **Date:** February 2016

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604250D8Z / <i>Advanced Innovative Technologies</i>	<b>Project (Number/Name)</b> P250 / <i>Advanced Innovative Technologies</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Railgun Proof-of-Principle Fire Control Sensors</i></b>				
Railgun Proof-of-Principle Fire Control Sensors	4	2015	4	2015
<b><i>Railgun Track Maneuvering Projectile</i></b>				
Railgun Track Maneuvering Projectile	1	2016	1	2016
<b><i>Railgun Test System at WSMR</i></b>				
Install Railgun Test System at WSMR	2	2016	2	2016
<b><i>ATC2: Integrate Service Clouds</i></b>				
Integrate Service Clouds	4	2015	1	2016
<b><i>ATC2: Advanced Security Enabled</i></b>				
Advanced Security Enabled	1	2016	2	2016
<b><i>ATC2: Red Teaming</i></b>				
Red Teaming	2	2016	4	2016
<b><i>Advanced Navigation USAF Contract Award</i></b>				
USAF Contract Award	3	2015	3	2015
<b><i>Advanced Navigation Weapons Drop Tests</i></b>				
Weapons Drop Tests	4	2016	1	2017
<b><i>ISR Denial Complete CDR</i></b>				
Complete CDR	2	2015	2	2015
<b><i>ISR Denial Initial Systems Test</i></b>				
Initial Systems Test	4	2015	4	2015
<b><i>ISR Denial Fleet Demonstration</i></b>				
Fleet Demonstration	3	2016	3	2016
<b><i>Enhanced Munitions Complete PDR</i></b>				
Complete PDR	4	2015	4	2015
<b><i>Enhanced Munitions Complete CDR</i></b>				

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**Exhibit R-4A, RDT&E Schedule Details:** PB 2017 Office of the Secretary Of Defense **Date:** February 2016

<b>Appropriation/Budget Activity</b> 0400 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604250D8Z / <i>Advanced Innovative Technologies</i>	<b>Project (Number/Name)</b> P250 / <i>Advanced Innovative Technologies</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Complete CDR	4	2016	4	2016
<b><i>Sea Dragon Initial Launch Demonstration</i></b>				
Initial Launch Demonstration	1	2016	4	2016
<b><i>Sea Dragon Follow-on Launch Demonstration</i></b>				
Follow-on Launch Demonstration	2	2016	3	2017
<b><i>Unmanned Aerial Vehicle Payloads CDR</i></b>				
CDR	2	2016	2	2016
<b><i>Unmanned Aerial Vehicle Payloads Swarming Demo</i></b>				
Swarming Demo	4	2016	4	2016
<b><i>Sea Mob Single Vehicle Autonomy at Extended Range</i></b>				
Single Vehicle Autonomy at Extended Range	4	2015	4	2015
<b><i>Sea Mob Simple Cooperative Behavior</i></b>				
Simple Cooperative Behavior	4	2016	4	2016
<b><i>Sea Mob Complex Cooperative Behavior</i></b>				
Complex Cooperative Behavior	1	2018	1	2018

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