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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy									DATE: February 2010		
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603925N: Directed Energy and Electric Weapon System							
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	4.548	19.223	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	71.775
9823: Lasers for Navy applicat	0.000	4.982	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.982
9999: Congressional Adds	4.548	14.241	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	66.793
A. Mission Description and Budget Item Justification											
<p>In accordance with NAVSEA Notice 5400, Ser 09B/240, Subj: ESTABLISHMENT OF THE NAVY DIRECTED ENERGY (DE) WEAPONS PROGRAM OFFICE (PMS 405), dated 4 Jan 02 and NAVSEA 5400.101, Ser SEA 06/058, Subj: DIRECTED ENERGY AND ELECTRIC WEAPONS PROGRAM OFFICE (PMS 405) CHARTER, dated 21 Jul 04 - COMNAVSEASYS COM (PMS 405) was assigned as the single Point of Contact for matters related to Directed Energy and Electric Weapon Systems development and acquisition initiation for the Navy and for those matters being coordinated with other Federal agencies and military services. The Naval Directed Energy and Electric Weapon Systems Program Office's (PMS 405) mission is to transition technology from the laboratory to prototype/advanced development/test for operational development and use. This will change the way the Navy fights in the 21st century by providing the war fighter with additional tools to fight today's and tomorrow's wars. This requires the effective management of Technology Development (BA-4) initiatives into System Development and Demonstration. PMS 405 will manage development of Directed Energy and Electric Weapon Systems onboard future naval surface ships that incorporate: Weapons Grade High Energy Lasers, Free Electron Lasers (Megawatt class), Electromagnetic Rail Gun (EMRG) Weapon Systems, High Power Microwave Weapon/Sensor Systems, and other systems/capabilities.</p>											
<p>In FY 09, \$1,755K was provided under Project Unit (PU) 9D61A for the Directed Energy Initiative (DEI) to support acceleration of development and testing of the Laser Weapon System (LaWS); \$1,596K was provided under PU 9D62A for Guillotine (G) efforts to support the acceleration of development and testing of a non-lethal, non-attributable system designed to offer non-kinetic offensive Information Operations (IO) solutions; and \$1,197K was provided under PU 9D63A for Multi Function Laser System (MFLS) efforts to support the development of the Visual Interruption System (VIS) capability to be integrated into the Laser Weapon System (LaWS).</p>											
<p>In FY 10, \$4,982K was provided under Project Unit 9823 to support Pacific Sail Proof of Concept prototype system development and demonstration. Congressional funding was provided for the following projects: \$1,494K was provided under Project Unit (PU) 10C132 to support technology development for Counter-Narcotics efforts as part of Global Law Enforcement; \$1,593K was provided under PU 10C133 to support Joint Technology Insertion and Accelerated System Integration Capability for Electronic Warfare; \$1,195K was provided under PU 10C134 to support Maritime Directed Energy Test Center (MDETC) efforts; \$9,959K was provided under PU 9823A to support Laser Weapon System (LaWS) technology development and test efforts in support of the Advanced Development Model (ADM) effort.</p>											

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Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>		R-1 ITEM NOMENCLATURE PE 0603925N: <i>Directed Energy and Electric Weapon System</i>
<p><u>Change Summary Explanation</u></p> <p>Technical: Not applicable.</p> <p>Schedule: Not applicable.</p> <p>FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>				R-1 ITEM NOMENCLATURE PE 0603925N: <i>Directed Energy and Electric Weapon System</i>				PROJECT 9823: <i>Lasers for Navy applicat</i>			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9823: <i>Lasers for Navy applicat</i>	0.000	4.982	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.982
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		
A. Mission Description and Budget Item Justification <p>The Pacific Sail effort utilizes Lasers for Navy Applications to develop a gyro-stabilized, multi-mission, optical system as a "Proof of Concept" capability for at-sea evaluation in support of tactical ship defense requirements.</p> <p>Funding was established in FY 2010 under this project unit to support prototype laser system development and system concept demonstration onboard a surface platform. This at-sea test and analysis will demonstrate operational effectiveness in support of Information Operations (IO), short-range ship defense/force protection, tracking and imaging, combat identification, and threat assessment.</p>											
B. Accomplishments/Planned Program (\$ in Millions)											
						FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
Lasers for Navy Applications						0.000	4.982	0.000	0.000	0.000	
<p>The Pacific Sail effort utilizes Lasers for Navy Applications to develop a gyro-stabilized, multi-mission, optical system as a "Proof of Concept" capability for at-sea evaluation in support of tactical ship defense requirements.</p> <p><i>FY 2010 Plans:</i> Funding was established in FY 2010 under this project unit to support laser prototype system development and system concept demonstration onboard a surface platform. This at-sea test and analysis will demonstrate operational effectiveness in support of Information Operations, short-range ship defense/force protection, long-range tracking and imaging, combat identification, and threat assessment.</p>											
Accomplishments/Planned Programs Subtotals						0.000	4.982	0.000	0.000	0.000	

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603925N: <i>Directed Energy and Electric Weapon System</i>	PROJECT 9823: <i>Lasers for Navy applicat</i>
<p><u>C. Other Program Funding Summary (\$ in Millions)</u> N/A</p> <p><u>D. Acquisition Strategy</u> Government Field Activities: Technology development and demonstration/test of capabilities for designated Directed Energy and Electric Weapon System components, subsystems, system(s). Program Office approved design, development, and demonstration/test efforts.</p> <p>Non-Government Activities: Technology development and demonstration/test of capabilities for designated Directed Energy and Electric Weapon System components, subsystems, system(s). Program Office approved design, development, and demonstration/test efforts.</p> <p><u>E. Performance Metrics</u> Quarterly Program Reviews</p>		

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy																								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)												R-1 ITEM NOMENCLATURE PE 0603925N: Directed Energy and Electric Weapon System												PROJECT 9823: Lasers for Navy applicat			
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Exhibit R-4A, RDT&E Schedule Details: PB 2011 Navy			DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>		R-1 ITEM NOMENCLATURE PE 0603925N: <i>Directed Energy and Electric Weapon System</i>		PROJECT 9823: <i>Lasers for Navy applicat</i>

Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
Prototype	1	2010	3	2010
Test Conduct	3	2010	4	2010
Test Report	4	2010	2	2011

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy								DATE: February 2010			
APPROPRIATION/BUDGET ACTIVITY 1319: Research, Development, Test & Evaluation, Navy BA 4: Advanced Component Development & Prototypes (ACD&P)				R-1 ITEM NOMENCLATURE PE 0603925N: Directed Energy and Electric Weapon System				PROJECT 9999: Congressional Adds			
COST (\$ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
9999: Congressional Adds	4.548	14.241	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	66.793
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

10C132 - Global Law Enforcement Support for Counter-Narcotics - Funding was provided to support the development and deployment of wireless intercept technology to aid in counter-narcotics operations in foreign countries.

10C133 - Joint Technology Insertion and Accelerated System Integration Capability for Electronic Warfare (EW) - Funding was provided for the development of an Electronic Warfare (EW) Capabilities Analysis Tool that can conduct 'capability versus threat' analyses using multiple, networked, Joint/Coalition EW Threat Databases.

10C134 - Maritime Directed Energy Test Center (MDETC) - Funding was provided for maritime-based Directed Energy (DE) testing and facility utilization at Pacific Missile Range Facility in Hawaii. Laser propagation test conduct and analysis, facility requirements/utilization planning and agreements, and addressing of environmental considerations associated with DE testing are integral to the overall operational DE test strategy for the Surface Navy.

9823A - Lasers for Navy Applications (Laser Weapon System) - Funding was provided to support the acceleration of technology development and testing of the Laser Weapon System (LaWS), to provide for Navy-funded development, production, and fielding in the near future. FY 10 funding supports the acceleration of LaWS engineering and development of the Advanced Development Model (ADM) to include: operational and employment concept requirements/definition; ADM test planning, coordination, and conduct; mechanical design of system components; LaWS-specific software development; CIWS integration; ship integration including space, weight, power, and cooling.

9D61A - Directed Energy Initiative (DEI) - Funding was provided to support the acceleration of development and testing of the Laser Weapon System (LaWS). FY 09 funding supported the acceleration of the development and testing of the Laser Weapon System (LaWS) engineering to include: investigation of Beam Director architecture options, range testing documentation, and development of a mature system design to mount a six beam laser Beam Director on the Close In Weapon System (CIWS); to assist in the establishment of initial program concepts, perform system engineering to develop performance specifications and perform research and development tests and simulations to investigate solutions to problems, assess alternative technical approaches to identify the best programmatic approach and evaluate design achievements to encompass all facets of this project. This prototype DE engagement element of the MK15 CIWS provides multi-mission "zero time of flight" defensive capability to counter limited asymmetric threats (Unmanned Aerial Vehicles (UAVs), jet skis, boats, threat Electro Optic/Infra Red (EO/IR) sensors, rockets, artillery, mortars, etc.) beyond existing CIWS hard kill ranges. The prototype laser weapon components will augment the existing CIWS in order to extend the

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603925N: <i>Directed Energy and Electric Weapon System</i>	PROJECT 9999: <i>Congressional Adds</i>
<p>effective range, provide enhanced lethality against certain target sets, and increase the weapon system's ability to counter a greater quantity (deep magazine) and spectrum of threats.</p> <p>9D62A - Guillotine (G) - Funding was provided to support the acceleration of development and testing of a non-lethal, non-attributable system designed to offer non-kinetic offensive IO solutions. FY 09 funding supported Guillotine development engineering to include: test platform modification, test target preparation, threat evaluation, modeling & simulation, testing, and analysis; technology evaluation to assist in the establishment of initial program concepts, perform system engineering to develop performance specifications and perform research development tests and simulations to investigate solutions to problems, assess alternative technical approaches to identify the best programmatic approach and evaluate design achievements to encompass all facets of this project.</p> <p>9D63A - Multi Function Laser System (MFLS) - Funding was provided for Multi-Function Laser System (MFLS) efforts to support the development of the Visual Interruption System (VIS) capability to be integrated into the Laser Weapon System (LaWS). FY 09 funding supported the development of the Visual Interruption System (VIS) capability to be integrated into the Laser Weapon System (LaWS) as part of the LaWS engagement element, to the Mk 15 CIWS that provides the non-lethal ability to confuse and deter attack; technology evaluation to assist in the establishment of initial program concepts, perform system engineering to develop performance specifications and perform research development tests and simulations to investigate solutions to problems, assess alternative technical approaches to identify the best programmatic approach and evaluate design achievements to encompass all facets of this project. This all weather capability application includes: swarming boat defense; harbor defense; perimeter defense; Force Protection. The prototype VIS components will augment the enhanced non-lethal options to the on-site Commander for Anti-terrorism / Force Protection (AT/FP) that determines hostile intent and denies personnel access under restrictive rules of engagement.</p>		
B. Accomplishments/Planned Program (\$ in Millions)		
	FY 2009	FY 2010
Congressional Add: Global Law Enforcement Support for Counter-Narcotics <i>FY 2010 Plans:</i> 10C132 - Global Law Enforcement Support for Counter-Narcotics: Funding was provided to support the development and deployment of wireless intercept technology to aid in counter-narcotics operations in foreign countries.	0.000	1.494
Congressional Add: Joint Tech Insertion and Accelerated System Integration Capability for Electroni	0.000	1.593

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Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program (\$ in Millions)		
	FY 2009	FY 2010
<i>FY 2010 Plans:</i> 10C133 - Joint Technology Insertion and Accelerated System Integration Capability for Electronic Warfare: Funding was provided for the development of an Electronic Warfare (EW) Capabilities Analysis Tool that can conduct 'capability versus threat' analyses using multiple, networked, Joint/Coalition EW Threat Databases.		
Congressional Add: Maritime Directed Energy Test and Evaluation Center <i>FY 2010 Plans:</i> 10C134 - Maritime Directed Energy Test Center (MDETC): Funding was provided for maritime-based Directed Energy (DE) testing and facility utilization at Pacific Missile Range Facility in Hawaii. Laser propagation test conduct and analysis, facility requirements/utilization planning and agreements, and addressing of environmental considerations associated with DE testing are integral to the overall operational DE test strategy for the Surface Navy.	0.000	1.195
Congressional Add: LASERS FOR NAVY APPLICATIONS <i>FY 2010 Plans:</i> 9823A - Lasers for Navy Applications (Laser Weapon System): Funding was provided to support the acceleration of technology development and testing of the Laser Weapon System (LaWS), to provide for Navy-funded development, production, and fielding in the near future. FY 10 funding supports the acceleration of LaWS engineering and development of the Advanced Development Model (ADM) to include: operational and employment concept requirements/definition; ADM test planning, coordination, and conduct; mechanical design of system components; LaWS-specific software development; CIWS integration; ship integration including space, weight, power, and cooling.	0.000	9.959
Congressional Add: Directed Energy Initiative	1.755	0.000

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B. Accomplishments/Planned Program (\$ in Millions)		
	FY 2009	FY 2010
<p><i>FY 2009 Accomplishments:</i></p> <p>Funding was provided to support the acceleration of development and testing of the Laser Weapon System (LaWS). FY 09 funding supported the acceleration of the development and testing of the Laser Weapon System (LaWS) engineering to include: investigation of Beam Director architecture options, range testing documentation, and development of a mature system design to mount a six beam laser Beam Director on the Close In Weapon System (CIWS); to assist in the establishment of initial program concepts, perform system engineering to develop performance specifications and perform research and development tests and simulations to investigate solutions to problems, assess alternative technical approaches to identify the best programmatic approach and evaluate design achievements to encompass all facets of this project. This prototype DE engagement element of the Mk15 CIWS provides multi-mission "zero time of flight" defensive capability to counter limited asymmetric threats (Unmanned Aerial Vehicles (UAVs), jet skis, boats, threat Electro Optic/Infra Red (EO/IR) sensors, rockets, artillery, mortars, etc.) beyond existing CIWS hard kill ranges. The prototype laser weapon components will augment the existing CIWS in order to extend the effective range, provide enhanced lethality against certain target sets, and increase the weapon system's ability to counter a greater quantity (deep magazine) and spectrum of threats.</p>		
<p>Congressional Add: Guillotine</p> <p><i>FY 2009 Accomplishments:</i></p> <p>Funding was provided to support the acceleration of development and testing of a non-lethal, non-attributable system designed to offer non-kinetic offensive IO solutions. FY 09 funding supported Guillotine development engineering to include: test platform modification, test target preparation, threat evaluation, modeling & simulation, testing, and analysis; technology evaluation to assist in the establishment of initial program concepts, perform system engineering to develop performance specifications and perform research development tests and simulations to investigate solutions to problems, assess alternative technical approaches to identify the best programmatic approach and evaluate design achievements to encompass all facets of this project.</p>	1.596	0.000

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<u>B. Accomplishments/Planned Program (\$ in Millions)</u>		
	FY 2009	FY 2010
Congressional Add: Multi-Function Laser System <i>FY 2009 Accomplishments:</i> Funding was provided for Multi-Function Laser System (MFLS) efforts to support the development of the Visual Interruption System (VIS) capability to be integrated into the Laser Weapon System (LaWS). FY 09 funding supported the development of the Visual Interruption System (VIS) capability to be integrated into the Laser Weapon System (LaWS) as part of the LaWS engagement element, to the Mk 15 CIWS that provides the non-lethal ability to confuse and deter attack; technology evaluation to assist in the establishment of initial program concepts, perform system engineering to develop performance specifications and perform research development tests and simulations to investigate solutions to problems, assess alternative technical approaches to identify the best programmatic approach and evaluate design achievements to encompass all facets of this project. This all weather capability application includes: swarming boat defense; harbor defense; perimeter defense; Force Protection. The prototype VIS components will augment the enhanced non-lethal options to the on-site Commander for Anti-terrorism / Force Protection (AT/FP) that determines hostile intent and denies personnel access under restrictive rules of engagement.	1.197	0.000
Congressional Adds Subtotals	4.548	14.241
<u>C. Other Program Funding Summary (\$ in Millions)</u> N/A		
<u>D. Acquisition Strategy</u> Not Applicable.		
<u>E. Performance Metrics</u> congressional adds.		

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Exhibit R-4, RDT&E Schedule Profile: PB 2011 Navy

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

1319: *Research, Development, Test & Evaluation, Navy*
BA 4: *Advanced Component Development & Prototypes (ACD&P)*

R-1 ITEM NOMENCLATURE

PE 0603925N: *Directed Energy and Electric Weapon System*

PROJECT

9999: *Congressional Adds*

	FY 2009				FY 2010				FY 2011				FY 2012				FY 2013				FY 2014				FY 2015			
	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
10C132 Preliminary Design Review (PDR)						■																						
10C132 Critical Design Review (CDR)							■																					
10C132 Prototype System Development								■	■																			
10C132 Field Evaluation									■	■																		
10C133 Preliminary Design Review (PDR)						■																						
10C133 Critical Design Review (CDR)							■																					
10C133 Prototype System Development								■	■	■																		
10C134 Preliminary Test Plan						■																						
10C134 Final Test Plan							■																					
10C134 Test Conduct								■																				
10C134 Test Analysis									■	■																		
10C134 Final Report										■																		
9823A Preliminary Design Review (PDR) Components/Integration						■	■																					
9823A Component Testing						■	■	■																				
9823A Critical Design Review (CDR) Components/Integration							■	■																				
9823A Prototype Components Procured								■	■																			
9823A System Testing										■																		

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APPROPRIATION/BUDGET ACTIVITY 1319: <i>Research, Development, Test & Evaluation, Navy</i> BA 4: <i>Advanced Component Development & Prototypes (ACD&P)</i>	R-1 ITEM NOMENCLATURE PE 0603925N: <i>Directed Energy and Electric Weapon System</i>	PROJECT 9999: <i>Congressional Adds</i>	

Schedule Details

Event	Start		End	
	Quarter	Year	Quarter	Year
10C132 Preliminary Design Review (PDR)	2	2010	2	2010
10C132 Critical Design Review (CDR)	3	2010	3	2010
10C132 Prototype System Development	4	2010	1	2011
10C132 Field Evaluation	1	2011	2	2011
10C133 Preliminary Design Review (PDR)	2	2010	2	2010
10C133 Critical Design Review (CDR)	3	2010	3	2010
10C133 Prototype System Development	4	2010	2	2011
10C134 Preliminary Test Plan	2	2010	2	2010
10C134 Final Test Plan	3	2010	3	2010
10C134 Test Conduct	4	2010	4	2010
10C134 Test Analysis	1	2011	2	2011
10C134 Final Report	2	2011	2	2011
9823A Preliminary Design Review (PDR) Components/Integration	2	2010	3	2010
9823A Component Testing	2	2010	4	2010
9823A Critical Design Review (CDR) Components/Integration	3	2010	4	2010
9823A Prototype Components Procured	4	2010	1	2011
9823A System Testing	2	2011	2	2011

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