Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Navy										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*					R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*						
COST ($ in Millions)	**FY 2010**	**FY 2011**	**FY 2012 Base**	**FY 2012 OCO**	**FY 2012 Total**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**Cost To Complete**	**Total Cost**
Total Program Element	29.575	9.480	10.893	-	10.893	8.806	7.315	6.507	6.625	Continuing	Continuing
0584: *Acft Protective Clothing*	3.276	5.978	7.106	-	7.106	5.047	3.644	2.762	2.817	Continuing	Continuing
0591: *Acft Survivability, Vulnerability & Safety*	1.560	1.467	1.643	-	1.643	1.635	1.601	1.634	1.664	Continuing	Continuing
0592: *Acft & Ordnance Safety*	1.598	1.393	1.417	-	1.417	1.401	1.363	1.390	1.413	Continuing	Continuing
1819: *CV Acft Fire Suppress System*	0.735	0.642	0.727	-	0.727	0.723	0.707	0.721	0.731	Continuing	Continuing
9999: *Congressional Adds*	22.406	-	-	-	-	-	-	-	-	0.000	22.406

A. Mission Description and Budget Item Justification

Aviation Survivability addresses the issues of aircrew and platform survivability, focusing on enhancing overall opportunity for aircrew and platform protection and enhanced performance. The capabilities addressed under this program element counter emerging threats of next generation operational weapons systems and enhance combat effectiveness in future operational mission scenarios.

B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	27.291	9.480	11.704	-	11.704
Current President's Budget	29.575	9.480	10.893	-	10.893
Total Adjustments	2.284	-	-0.811	-	-0.811
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	2.410	-			
• SBIR/STTR Transfer	-0.028	-			
• Program Adjustments	-	-	-0.589	-	-0.589
• Section 219 Reprogramming	-0.098	-	-	-	-
• Rate/Misc Adjustments	-	-	-0.222	-	-0.222

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2010	FY 2011
Project: 9999: *Congressional Adds*		

Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Navy	DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2010	FY 2011
Congressional Add: *Head Attitude Tracking System*	1.593	-
Congressional Add: *Common Safety System Controller*	2.390	-
Congressional Add: *Conformal Ceramics for Enhanced Aviation Armor Systems*	2.490	-
Congressional Add: *Improved Capabilities for Irregular Warfare Platforms*	3.983	-
Congressional Add: *Integrated Manifold and Tube Ceramic Oxygen Generator*	4.780	-
Congressional Add: *Lighter-than-Air Stratospheric Unmanned Aerial Vehicle*	2.390	-
Congressional Add: *Military Upset Recovery Training*	0.797	-
Congressional Add: *Unmanned Aircraft Sys Optimization Tech Program*	2.390	-
Congressional Add: *Modular Advanced Helmet Visition System*	1.593	-
Congressional Add Subtotals for Project: 9999	22.406	-
Congressional Add Totals for all Projects	22.406	-

Change Summary Explanation

Technical: Not applicable.

Schedule: 0584 changes due to additional tasking added to Injury Prevention to include Traumatic Brain Injury to the head / neck model. Additional Advanced Helmet Vision System laboratory testing added to characterize tactical (fixed wing) system. 0591: A delay in the Technology Design and Development of the Rotary Wing Prototype Hardware effort has delayed the Technology Test and Evaluation of the Rotary Wing Ballistic and Signature testing.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0584: *Acft Protective Clothing*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
0584: *Acft Protective Clothing*	3.276	5.978	7.106	-	7.106	5.047	3.644	2.762	2.817	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Project 0584 develops, demonstrates, and validates technologies designed to enhance warfighter performance, protection, mission effectiveness, and survivability. The project addresses life support equipment, advanced helmet vision systems, escape systems technology, crew centered cockpit design, and control stations. Integrate and use alternative and new technologies for the Pilot Vehicle Integration, optimization of Intelligence Surveillance and Reconnaissance (ISR), and Forward Air Control-Air mission areas. Demonstrate innovative tools / approaches to improve situational awareness, new ISR technologies, and Graphical User Interfaces (new symbology and optimized logic for system employment). It responds to a number of operational requirements documents, including OR# 210-05-88 for Chemical and Biological protection, OR# 099-05-087 for Laser Eye Protection, and the joint Air Force/Navy (CAF-208-93) for an Aerospace Control Helmet Mounted Cueing System.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Advanced Technology Crew Station	2.253	4.954	5.617
Articles:	0	0	0
FY 2010 Accomplishments: Integrated common symbology in open architecture into a common command and control station for Unmanned Air Vehicles. Developed and tested side facing seat and improved restraint system. Tested new side facing crashworthy troop seating on H-60 platform. Used Parachute Opening Shock Emulator and the biofidelic models to integrate results of injury prevention research into protective equipment design and testing to include helmet mounted devices and into ejection seat design for improved seat performance, retention, and safety.			
FY 2011 Plans: Develop high resolution Ultra eXtended Graphics Array Charge Coupled Device day / night vision cameras. Begin safety of flight testing on a tactical platform. Migrate crashworthy seating designs to the fast attack boat community. Focus on shock and vibration work. Under Pilot Vehicle Interface draft experimental paradigm in collaboration with the Royal Netherlands Air Force to assess the relationship between scan patterns (e.g., eye movements) and information processing.			
FY 2012 Plans: Expand capability of rotary system to accommodate tactical platforms, begin integration of high resolution 4 megapixel cameras. Begin collaborative experimental data collection with the Netherlands under the signed Memorandum of Agreement to determine optimal scan patterns. Studies will occur in both the United States and Netherlands Ministry of Defense simulators. Continue the development and testing of the smart controllers for cockpit and external airbag deployment.			
Title: Advanced Integrated Life Support System	1.023	1.024	1.489

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0584: *Acft Protective Clothing*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Articles:	0	0	0
FY 2010 Accomplishments: Completed optical design to determine feasibility of integrating the Unity Magnification Goggle into the Advanced Helmet Mounted Display (HMD) system. Completed and demonstrated a split fixed wavelength design for helmet mounted displays. Goal was to provide multi wavelength protection while not impacting visibility of HMD symbology. Developed an aircraft personal air conditioning systems. ***FY 2011 Plans:*** Complete and standardize fixed wavelength protective technologies to accommodate all substrates (spectacle, visor, goggle, step-in visor). Demonstrate protection in a visor and spectacle format. Finalize design for both man and aircraft mounted cooling system. ***FY 2012 Plans:*** Develop prototype personal mounted cooling device for initial testing. Modify visor / spectacle laser protective technologies to include color balancing. Color balancing will improve cockpit compatibility by reducing spectral distortion.			
Accomplishments/Planned Programs Subtotals	3.276	5.978	7.106

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Primary Hardware Development for the Navy Advanced Technology Crew Station efforts in FY11 will be performed under a Cost Plus Fixed Fee Indefinite Delivery Indefinite Quantity contract.

E. Performance Metrics

Complete development of advanced crashworthy system level models, investigate improved visual search methodologies, and improve the ability to assess cockpit compatibility through new analytic approaches to anthropometry.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0584: *Acft Protective Clothing*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPFF	Gentex*:Simpson, PA*	4.735	2.951	Mar 2011	4.317	Jan 2012	-		4.317	0.000	12.003	12.003
Systems Engineering	WR	NAWCAD:Pax River MD	28.780	1.111	Dec 2010	1.090	Dec 2011	-		1.090	Continuing	Continuing	Continuing
Licenses	WR	NAWCAD:Pax River MD	0.900	0.185	Dec 2010	0.211	Dec 2011	-		0.211	Continuing	Continuing	Continuing
Prior Year Prod Dev no Longer Funded in Budget Year or Outyears	Various	Various:Various	13.900	-		-		-		-	0.000	13.900	
		Subtotal	48.315	4.247		5.618		-		5.618			

Remarks

For Primary Hardware Development efforts in FY11 and beyond, Gentex is the performing activity while multiple vendors performed these efforts prior to FY11.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Configuration Management	WR	NAWCAD:Pax River MD	0.732	0.496	Dec 2010	0.596	Dec 2011	-		0.596	Continuing	Continuing	Continuing
Prior Year Support no Longer Funded in Budget Year or Outyears	Various	Various:Various	3.232	-		-		-		-	0.000	3.232	
		Subtotal	3.964	0.496		0.596		-		0.596			

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD:Pax River MD	1.928	0.855	Dec 2010	0.502	Dec 2011	-		0.502	Continuing	Continuing	Continuing
	Various	Various:Various	18.240	-		-		-		-	0.000	18.240	

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0584: *Acft Protective Clothing*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year T&E no Longer Funded in Budget Year or Outyears													
		Subtotal	20.168	0.855		0.502		-		0.502			

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD:Pax River MD	1.790	0.330	Dec 2010	0.340	Dec 2011	-		0.340	Continuing	Continuing	Continuing
Travel	PO	NAVAIR:Pax River MD	0.335	0.050	Oct 2010	0.050	Oct 2011	-		0.050	Continuing	Continuing	Continuing
Acquisition Workforce Fund	Various	Various:Various	0.010	-		-		-		-	0.000	0.010	
		Subtotal	2.135	0.380		0.390		-		0.390			

	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	74.582	5.978		7.106		-		7.106			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*	**PROJECT** 0584: *Acft Protective Clothing*

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*	**PROJECT** 0584: *Acft Protective Clothing*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acft Protective Clothing				
Acquisition Milestones: Intensified Unity Mag Goggle	1	2010	2	2011
Acquisition Milestones: Advanced Helmet Vision System (AHVS)	1	2010	4	2016
Acquisition Milestones: Advanced Integrated Life Support Systems (AILSS)	1	2010	4	2016
Acquisition Milestones: Injury Prevention	1	2010	4	2013
Test & Evaluation Milestones: AHVS Laboratory Testing	1	2010	2	2014
Test & Evaluation Milestones: AHVS Safety of Flight Testing	1	2011	4	2015
Test & Evaluation Milestones: Advanced Technology Crew Station (ATCS)	1	2010	4	2016

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0591: *Acft Survivability, Vulnerability & Safety*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
0591: *Acft Survivability, Vulnerability & Safety*	1.560	1.467	1.643	-	1.643	1.635	1.601	1.634	1.664	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Aircraft Survivability, Vulnerability and Safety. This project develops prototype hardware to improve the survivability of Navy and Marine Corps aircraft. This project addresses the likelihood of an aircraft being hit (susceptibility) and the probability of a kill if the aircraft is hit (vulnerability). Types of programs funded under this project include signature reduction efforts, subsystem and component hardening and development of fire and explosion suppression techniques for fuel systems.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Technology Requirements	0.272	0.251	0.278
Articles:	0	0	0
FY 2010 Accomplishments: Updated program master plan based on trade studies to determine future technology requirements. Planned trade studies include acoustic and infrared signature reduction, rotary wing survivability requirements, fire protection technologies and threat systems analysis.			
FY 2011 Plans: Update program master plan based on trade studies to determine future technology requirements. Planned trade studies include acoustic and infrared signature reduction, rotary wing survivability requirements, fire protection technologies, and threat systems analysis.			
FY 2012 Plans: Update program master plan based on trade studies to determine future technology requirements. Planned trade studies include acoustic and infrared signature reduction, rotary wing survivability requirements, fire protection technologies, threat systems analysis, and biofuels impacts to survivability systems.			
Title: Technology Design & Development	0.919	0.807	0.920
Articles:	0	0	0
FY 2010 Accomplishments: Identified technology gaps between threat systems and platform signatures and research technology solutions. Developed prototype polymer coating for gearbox application to meet the ballistic 30-minute requirement.			
FY 2011 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0591: *Acft Survivability, Vulnerability & Safety*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Develop prototype materials to reduce acoustic/infrared footprint of operational platforms. Develop and demonstrate/validate production prototype of transparent armor canopy. Develop platform-specific gearbox polymer modifications. ***FY 2012 Plans:*** Develop prototype materials to reduce acoustic/infrared footprint of operational platforms. Develop and demonstrate/validate phase II prototype of transparent armor canopy and egress system. Develop platform-specific gearbox polymer modifications. Develop biofuels-compatible fuel bladders for testing.			
Title: Technology Test & Evaluation	0.369	0.409	0.445
Articles:	0	0	0
FY 2010 Accomplishments: Evaluated alternative materials for design of the advanced survivable canopy. Received delivery of procured threat systems. Performed live fire testing with threat systems; updated threat system databases; evaluated threat systems against platforms. ***FY 2011 Plans:*** Flight test armored canopy. Perform live fire testing on platform specific gearbox polymer modifications. Perform live fire test on Green On Board Inert Gas Generation System prototype. ***FY 2012 Plans:*** Flight test armored canopy. Perform live fire testing on platform specific gearbox polymer modifications. Perform live fire test on biofuels-compatible fuel bladder.			
Accomplishments/Planned Programs Subtotals	1.560	1.467	1.643

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Primary Hardware Development will be performed under either a Cost Plus Fixed Fee or a Firm Fixed Price contract.

E. Performance Metrics

Evaluate 100% of deployed/developmental USN/USMC aircraft platforms for survivability deficiencies using Navy gap analysis as baseline. Identify prototype hardware solutions to address 25% to 50% of deficiencies, and initiate a minimum of two new demonstration projects per year.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0591: *Acft Survivability, Vulnerability & Safety*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPFF	Bell Helicopter:Dallas, TX	1.661	0.646	Mar 2011	0.220	Mar 2012	-		0.220	0.000	2.527	2.714
Primary Hardware Development	Various	NAWCAD:Pax River, MD	9.696	-		0.256	Oct 2011	-		0.256	0.000	9.952	
Systems Engineering	Various	NAWCAD:Pax River, MD	10.075	0.465	Oct 2010	0.496	Oct 2011	-		0.496	Continuing	Continuing	Continuing
Systems Engineering	Allot	NAWCWD:China Lake, CA	-	-		0.050	Oct 2011	-		0.050	0.000	0.050	
Prior Year MgmtT&E no Longer Funded in Budget Year or Outyears	Various	Various:Various	4.770	-		-		-		-	0.000	4.770	
		Subtotal	26.202	1.111		1.022		-		1.022			

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year Support no Longer Funded in Budget Year or Outyears	Various	Various:Various	4.569	-		-		-		-	0.000	4.569	
		Subtotal	4.569	-		-		-		-	0.000	4.569	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NAWCAD:Pax River, MD	2.138	0.010	Mar 2011	0.115	Oct 2011	-		0.115	Continuing	Continuing	Continuing
Live Fire Test & Evaluation	MIPR	Army Research Lab:Aberdeen, MD	0.393	0.164	Jun 2011	0.103	Mar 2012	-		0.103	Continuing	Continuing	Continuing
Live Fire Test & Evaluation	WR		1.495	-		0.150	Oct 2011	-		0.150	Continuing	Continuing	Continuing

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0591: *Acft Survivability, Vulnerability & Safety*

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
		NAWCWD:China Lake, CA											
Prior Year T&E no Longer Funded in Budget Year or Outyears	Various	Various:Various	0.348	-		-		-		-	0.000	0.348	
		Subtotal	4.374	0.174		0.368		-		0.368			

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management Support	WR	NAWCAD:Pax River, MD	0.838	0.041	Oct 2010	0.238	Oct 2011	-		0.238	Continuing	Continuing	Continuing
Program Management Support	C/CPFF	JF Taylor:Lexington Park, MD	0.201	0.131	Oct 2010	-		-		-	Continuing	Continuing	Continuing
Travel	PO	NAVAIR:Patuxent River, MD	0.314	0.010	Oct 2010	0.015	Dec 2011	-		0.015	Continuing	Continuing	Continuing
Acquisition Workforce Fund	Various	Various:Various	0.008	-		-		-		-	0.000	0.008	
		Subtotal	1.361	0.182		0.253		-		0.253			

	Total Prior Years Cost	FY 2011		FY 2012 Base		FY 2012 OCO		FY 2012 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	36.506	1.467		1.643		-		1.643			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*	**PROJECT** 0591: *Acft Survivability, Vulnerability & Safety*

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*	**PROJECT** 0591: *Acft Survivability, Vulnerability & Safety*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acft Survivability, Vulnerability & Safe				
Technology Requirements: Survivability Master Plan Update 1	4	2011	4	2011
Technology Requirements: Survivability Master Plan Update 2	4	2013	4	2013
Technology Requirements: Survivability Master Plan Update 3	4	2015	4	2015
Technology Requirements: Asymmetric Threat Evaluations	1	2010	4	2016
Technology Design & Development: Rotary Wing Prototype Hardware	1	2010	4	2012
Technology Design & Development: Survivability Improvements	1	2010	4	2016
Technology Test & Evaluation: Rotary Wing Ballistic Testing	1	2010	4	2012
Technology Test & Evaluation: Rotary Wing Signature Tests	1	2010	4	2012
Technology Test & Evaluation: Prototype Hardware Tests	1	2010	4	2015

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0592: *Acft & Ordnance Safety*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
0592: *Acft & Ordnance Safety*	1.598	1.393	1.417	-	1.417	1.401	1.363	1.390	1.413	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

The Aircraft and Ordnance Safety Program transitions innovative munitions safety technology to Navy and Marine Corps air weapons, to comply with the Chief of Naval Operations direction that all munitions carried aboard Navy ships be insensitive to unplanned stimuli (thermal, impact, and shock events). The Aircraft and Ordnance Safety Program also ensures the safety and protection of personnel, aircraft, ships, and operational facilities, through improved precision targeting, fail-safe ordnance, selective effects munitions and shock/blast force protection technologies.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Insensitive Munitions	1.598	1.393	1.417
Articles:	0	0	0

FY 2010 Accomplishments:

Conducted improved air-to-air missile demonstration and testing. Output: baseline Insensitive Munitions (IM) performance of 5-inch warhead for Fragment Impact mitigation and rocket motor technology for Air-to-Air applications. Conducted shock/blast barrier protection modeling/demonstration and testing.

Demonstrated candidate materials as Sympathetic Detonation (SD) and impact barriers for weapon shipping containers. Investigated alternative mitigation materials. Output: design and modeling of layered material technology to mitigate bullet and fragment impact threats to High-Speed Anti-Radiation Missile container. Conducted initial evaluation of new pallet design for Mk 126 SD mitigation. Evaluated SD mitigation for Tomahawk in logistic phase.

Demonstrated improved air-launched munitions. Began analysis, design, and demonstration of an improved Navy IM bomb that will mitigate SD and cook-off threats. Output: Evaluation of reactive liner as a SD mitigation for bombs (Mk 110 and 111).

Developed and validated IM to advanced energetic material warheads and rocket motors, hyperbaric materials, new binding materials, novel fuses, and high energy density materials. Continued improved Navy IM bomb analysis/design/demonstration. Output: design/characterization of a high-output explosive with reduced shock sensitivity.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0592: *Acft & Ordnance Safety*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Developed and validated IM solutions for advanced containment/case/warhead materials: metal matrix composite materials, high-temperature cases, reactive warheads, composite cases. Continued evaluating reactive material warheads for IM compliance. Output: design and initial proof of composite case design for large-diameter rocket motor (Tomahawk) IM mitigation. ***FY 2011 Plans:*** Improve Air-to-Air Demonstration: The Sidewinder warhead evaluation will continue in direct support of PMA 259 FY14 planned transition. The Sidewinder Rocket motor technology evaluation will also continue in support of a potential PMA 259 FY14 transition. Initiate IM technology demonstration for 8-inch metal matrix rocket motor. Improve Air-Launched Weapons: Continue reactive liner evaluation in support of current transition efforts in bombs (BLU 110/111). Continue evaluation of affordable, high-performance, low shock sensitivity explosive for use with reactive liner and other potential applications. Initiate IM evaluation for Tomahawk tandem warhead. Advanced Containment/Case/Warhead Materials: Complete Tomahawk SD test/analysis in CNU-308 container. Continue pallet design/demonstration for BLU-126. Continue Tomahawk composite case Mk 135 design/demonstration. Shock/Blast Barrier Protection Modeling, Demonstration, and Testing: Continue Advanced Anti-Radiation Guided Missile (AARGM) container design/demonstration for PMA 242 planned transition (FY11 focus on modeling/design based on FY10 baseline testing). ***FY 2012 Plans:*** Improve Air-to-Air Demonstration: Continue Sidewinder warhead/rocket motor evaluation in direct support of PMA 259 FY14 planned transition. Continue IM technology demonstration for 8-inch metal matrix rocket motor. Improve Air-Launched Weapons: Continue reactive liner evaluation in support of current transition efforts in bombs (BLU 110/111). Continue IM evaluation for Tomahawk tandem warhead. Initiate minimum smoke propellant demonstration for rockets (transition out of Joint Service IM Technology Program). Advanced Containment/Case/Warhead Materials: Continue Tomahawk composite case Mk 135 design/demo. Initiate IM evaluation of new Mk 135 propellant in composite case. Shock/Blast Barrier Protection Modeling, Demonstration, and Testing: Continue AARGM container design/demonstration for PMA 242 planned transition (finalize design/initiate IM testing). Initiate shape charge jet test/evaluation for NAVAIR priority IM weapons.			
Accomplishments/Planned Programs Subtotals	1.598	1.393	1.417

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0592: *Acft & Ordnance Safety*

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not applicable.

E. Performance Metrics

The Aircraft and Ordnance Safety program will initiate six to nine technology development/maturation efforts to improve Insensitive Munitions signature and will work to transition those technologies to weapons programs. The weapons programs will be chosen based on PEO(U&W) weapons portfolio and will focus on the priority weapons as defined in the 2011/2012 Insensitive Munitions strategic plan.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 0592: *Acft & Ordnance Safety*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering	WR	NAWCWD:China Lake, CA	28.243	1.393	Nov 2010	1.417	Nov 2011	-		1.417	Continuing	Continuing	Continuing
		Subtotal	28.243	1.393		1.417		-		1.417			

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Acquisition Workforce Fund	Various	Various:Various	0.008	-		-		-		-	0.000	0.008	
		Subtotal	0.008	-		-		-		-	0.000	0.008	

	Total Prior Years Cost	FY 2011 Cost	FY 2011 Award Date	FY 2012 Base Cost	FY 2012 Base Award Date	FY 2012 OCO Cost	FY 2012 OCO Award Date	FY 2012 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	28.251	1.393		1.417		-		1.417			

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*	**PROJECT** 0592: *Acft & Ordnance Safety*

Exhibit R-4A, RDT&E Schedule Details: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*	**PROJECT** 0592: *Acft & Ordnance Safety*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Acft & Ordnance Safety				
Air-to-Air Missile Demonstration/Testing	1	2010	4	2016
Improved Air-Launched Weapons	1	2010	4	2016
Advanced Containment/Case/Warhead Materials	1	2010	4	2016
Shock/Blast Barrier Protection Modeling Demonstration/Testing	1	2010	4	2016
Advanced Energetic Materials	1	2010	4	2016

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 1819: *CV Acft Fire Suppress System*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
1819: *CV Acft Fire Suppress System*	0.735	0.642	0.727	-	0.727	0.723	0.707	0.721	0.731	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

This project develops improved fire-fighting systems and fire protective measures for aircraft-related fires on aircraft carriers, including assessment of fire properties, definition of fire threats, improvements to fire-fighting agents and delivery systems, fire detection and suppression system performance evaluations, and fire-fighter training improvements.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Title: Fire-Fighting	0.735	0.642	0.727
Articles:	0	0	0

FY 2010 Accomplishments:

Completed final testing of Halon 1211 commercial off-the-shelf replacement agent flight line extinguisher testing. Finalized high-occupancy/rolled helicopter rescue procedures. Conducted evaluation of high-durability aluminization material for proximity fire-fighting. Developed and initiated evaluation of next generation of proximity suits to address wear in crotch areas. Conducted testing of portable powered emergency external aircraft canopy opening devices on additional model carrier aircraft. Authored standardized procedures for mitigation of carrier main deck fuel station fires. Authored draft standardized procedures for mitigation of carrier gallery deck fuel station fires. Authored amphibious hangar bay conflagration self-contained breathing apparatus concept of operations. Provided subject matter expert support to the Aircraft Fire Fighting NATOPS (80R-14) model manager during the upcoming 80R-14 NATOPS Rewrite Conference. Initiated development of procedures and hardware for cooling of Joint Strike Fighter (JSF) internally carried ordnance.

FY 2011 Plans:

Test hardware for cooling of JSF internally carried ordnance. Finalize procedures for cooling of JSF internally carried ordnance. Evaluate adequacy of current procedures for handling aircraft composite fires with consideration of new-generation aircraft composites. Evaluate the feasibility/need for a flash hood with composite filtering capability. Author necessary revisions/additions to the Aircraft Fire-Fighting NATOPS and submit for consideration. Provide subject matter expert support to the Aircraft Fire Fighting NATOPS (80R-14) model manager during the upcoming 80R-14 NATOPS Rewrite Conference. Initiate development Aqueous Film-Forming Foam (AFFF) application nozzle and procedures for Electromagnetic Aircraft Launch System (EMALS).

FY 2012 Plans:

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 1819: *CV Acft Fire Suppress System*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2010	FY 2011	FY 2012
Continue to test hardware for cooling of JSF internally carried ordnance. Continue development AFFF application nozzle and procedures for of EMALS. Finalize procedures for cooling of JSF internally carried ordnance. Provide subject matter expert support to the Aircraft Fire Fighting NATOPS (80R-14) model manager during the upcoming 80R-14 NATOPS Rewrite Conference. Evaluate the effectiveness of and economies afforded by intermittent weapons cooling streams (vice constant). Continue participation in development/testing of new environmentally friendly AFFF concentrates.			
Accomplishments/Planned Programs Subtotals	0.735	0.642	0.727

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not applicable.

E. Performance Metrics

The Carrier Aircraft Fire Suppression (CAFS) program will, at a minimum, fund 6 to 10 projects per year that investigate and evaluate tactical capability gaps and potential capability improvements regarding shipboard aircraft fire suppression doctrine and equipment. CAFS projects will have a greater than 90% success rate of insertion into DON shipboard aircraft fire-fighting procedures and documentation.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603216N: *Aviation Survivability*	PROJECT 9999: *Congressional Adds*	

COST ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
9999: *Congressional Adds*	22.406	-	-	-	-	-	-	-	-	0.000	22.406
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

Congressional Add

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011
Congressional Add: Head Attitude Tracking System ***FY 2010 Accomplishments:*** The funds supports development of a Head Attitude Tracking System.	1.593	-
Congressional Add: Common Safety System Controller ***FY 2010 Accomplishments:*** This is a sensor system that will control airbag deployment in the cockpit and on the exterior of rotary wing platforms. Unlike automobile airbag controllers, this will be predictive rather than just solely reactive to achieve required response / activation times.	2.390	-
Congressional Add: Conformal Ceramics for Enhanced Aviation Armor Systems ***FY 2010 Accomplishments:*** New aircraft and personnel armor system for the warfighter. The approach provided lightweight, conformal aircraft and personnel armor using a new process for developing materials with unique ceramic properties.	2.490	-
Congressional Add: Improved Capabilities for Irregular Warfare Platforms ***FY 2010 Accomplishments:*** This effort integrated the new common operational picture and emerging situational awareness technologies. Funding supported mission relevant exercises to empirically assess these technologies.	3.983	-
Congressional Add: Integrated Manifold and Tube Ceramic Oxygen Generator ***FY 2010 Accomplishments:*** This is a continuation of an earlier add to develop a passive, high purity oxygen generating system to replace the current on board liquid oxygen system.	4.780	-
Congressional Add: Lighter-than-Air Stratospheric Unmanned Aerial Vehicle	2.390	-

Exhibit R-2A, RDT&E Project Justification: PB 2012 Navy		DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603216N: *Aviation Survivability*	**PROJECT** 9999: *Congressional Adds*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011
FY 2010 Accomplishments: Developed a lighter than air, unmanned air vehicle that will fly at 85K feet for 3 to 4 months to provide low cost, persistent surveillance with high bandwidth over the horizon communication capability.		
Congressional Add: Military Upset Recovery Training ***FY 2010 Accomplishments:*** Conducted operational testing and further analysis of an In-Flight Simulation based training program, which will support advance of training critical piloting skills in the regime of upset recovery. The initial funding allowed the In-Flight Simulator to be programmed to exhibit representative characteristics to include relatively heavy control forces and sluggish response so as to illustrate the inherent difficulty in recoverying from jet upsets in this class of aircraft and to conduct initial evaluations to measure pilot performance and recovery quality.	0.797	-
Congressional Add: Unmanned Aircraft Sys Optimization Tech Program ***FY 2010 Accomplishments:*** Continued development of next generation systems for Swarming control unmanned vehicle systems.	2.390	-
Congressional Add: Modular Advanced Helmet Visition System ***FY 2010 Accomplishments:*** The Modular Advanced Helmet Vision Systems (MAHVS) provided significantly improved impact, hearing, laser eye, and chem-bio protection, along with communications and oxygen delivery, in a versatile, low-cost, mission reconfigurable design.	1.593	-
Congressional Adds Subtotals	22.406	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

Not required for Congressional Adds

E. Performance Metrics

Not required for Congressional Adds