Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Office of Secretary Of Defense										DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0605017D8Z: *Reduction of Total Ownership Cost (RTOC)*							
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	22.870	20.310	-	-	-	-	-	-	-	0.000	43.180
017: *RTOC*	22.870	20.310	-	-	-	-	-	-	-	0.000	43.180

Note

Defense Efficiency – Baseline Review. As part of the Secretary of Defense's efficiency reform agenda for the Department, a zero-based review of the organization's programs to align resources to the most critical priorities and eliminate lower priority functions was performed. As part of this initiative, the R-TOC program will complete FY11 efforts, and will be terminated in FY12.

A. Mission Description and Budget Item Justification

The Under Secretary of Defense (Acquisition, Technology & Logistics) defined the mission for the Reduction in Total Ownership Cost (R-TOC) program as the reduction of ownership costs for defense systems. The R-TOC program funded activities and initiatives that:

1. Increased the reliability, maintainability, supportability--and thus increased readiness--of new or existing defense systems.
2. Reduced logistics footprint.
3. Generated future cost reductions in total ownership cost.

Individual Service Projects are complete efforts within themselves that yield complete developments/redesigns which the Services are committed to put into production and operation. The initiatives optimized cost avoidance, ultimately reducing the operating and support costs for systems. Each project was evaluated against a rigorous set of criteria to assess its viability and probability of success. Individual projects addressed specific Service needs and high Operations and Support (O&S) cost areas.

The Department set a FY 2010 R-TOC goal of reducing the total defense systems inflation increase in O&S cost by 30 percent between FY 2004 and FY 2010. This PE provided a major portion of the program funding to achieve this goal. The successful demonstration of the R-TOC program initiatives stimulated additional initiatives by the Services to achieve even greater cost avoidance. In FY12 the program devolves to the Services.

Individual R-TOC Project Management will continue to rest with the Services and their Project Managers after being devolved. Each Service has an active R-TOC Point of Contact (POC) for the initial interface between the Office of the Secretary of Defense (OSD) and the R-TOC Project Managers.

The average Return on Investment (ROI) for FY 2010 projects (based on discounted cash flow calculations) is approximately 80:1 with $1.333 billion in cost avoidance across the life cycle of the affected systems. The average ROI for the FY 2011 projects (based on discounted cash flow calculations) is approximately 53:1 with $2.049 billion in cost avoidance across the life cycle of the affected systems.

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B. Program Change Summary ($ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	24.647	20.310	26.364	-	26.364
Current President's Budget	22.870	20.310	-	-	-
Total Adjustments	-1.777	-	-26.364	-	-26.364
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	-1.000	-			
• SBIR/STTR Transfer	-0.540	-			
• Other Program Adjustments	-0.237	-	-	-	-
• Defense Efficiency – Baseline Review	-	-	-26.364	-	-26.364

Change Summary Explanation

Defense Efficiency – Baseline Review. As part of the Secretary of Defense's efficiency reform agenda for the Department, a zero-based review of the organization's programs to align resources to the most critical priorities and eliminate lower priority functions was performed. As part of this initiative, the R-TOC program will be terminated in FY12.

Exhibit R-2A, RDT&E Project Justification: PB 2012 Office of Secretary Of Defense			DATE: February 2011
APPROPRIATION/BUDGET ACTIVITY 0400: *Research, Development, Test & Evaluation, Defense-Wide* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0605017D8Z: *Reduction of Total Ownership Cost (RTOC)*	PROJECT 017: *RTOC*	

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
017: *RTOC*	22.870	20.310	-	-	-	-	-	-	-	0.000	43.180
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

The Under Secretary of Defense, Acquisition, Technology & Logistics (USD(AT&L), defined the mission for the Reduction in Total Ownership Cost (R-TOC) program as the reduction of ownership costs for defense systems. The R-TOC program funded activities and initiatives that:

1. Increased the reliability, maintainability, supportability and thus increased readiness of new or existing defense systems.
2. Reduced logistics footprint.
3. Generated future cost reductions in total ownership cost.

These individual initiatives were complete efforts within themselves that yield complete redesigns which the Services were committed to put into production and operation. The initiatives optimize cost avoidance, ultimately reducing the operating and support (O&S) costs for systems.

The Department set an FY 2010 R-TOC goal of reducing the total defense systems inflation increase in operations and support cost by 30 percent between FY 2004 (baseline) and FY 2010. In FY11 OSD will transition the program to the Services. OSD will only fund those projects that will be completed during FY11. There will be no R-TOC PE funded carry-over projects into FY12. The Services will assume responsibility for the program in FY12.

The average Return on Investment (ROI) for FY 2009 projects (based on discounted cash flow calculations) is approximately 45:1 with $1.174 billion in cost avoidances across the life cycle of the affected systems. The average ROI for the FY 2010 projects (based on discounted cash flow calculations) is approximately 80:1 with $1.333 billion in cost avoidances across the life cycle of the affected systems.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Title: Reduction of Total Ownership Cost Efforts	22.870	20.310	-
Description: In FY 2010, the Services completed all FY2009 projects and started eighteen new projects. Cost avoidances established for the projects listed below are based on engineering estimates of the benefits provided by project implementations. Sources of cost avoidances are defined as part of the project submittal and come from any O&S cost source (fewer spares, lower maintenance hours, faster turnaround times, reduced scheduled maintenance, reliability/maintainability/supportability problems, etc.).			
FY 2010 Accomplishments:			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
Completed all projects begun in FY 2009 and started eighteen new projects for FY 2010. The objective of each of the Service projects, listed below, is the reduction of operations and support costs for the affected systems. ROI is the primary performance metric used to assess projects and for the R-TOC initiative. Project plans include a cost/benefit analysis, which was based on discounted cash flow calculations of project investment costs and projected cost avoidances. Other factors were also considered as the Services developed their ranked order of projects. Improvements in reliability, maintainability, and supportability provided additional criteria for project selection. OMB discounted rates were used to provide real comparisons of future value against current uses of resources. Projected cost avoidances are based on engineering estimates of the benefits provided by project implementations. Updated ROI calculations are part of the required semi-annual project reports to provide tracking of this metric. The estimated ROI for FY 2010 projects (based on discounted cash flow calculations) is 80:1 with $1.333 billion in cost avoidances across the life cycle of the affected systems. Army Projects: Completed all projects begun in FY 2009 and initiated four new projects. The Common Avionics Architecture System (Unmanned Aerial System (UAS) Prognostic Sensors was proposed because the Army experienced unanticipated catastrophic failures in the UAS fleet. The proposed solution was to develop and prototype sensors for the UAS to predict future problems before catastrophic failures. The HH-60 Forward Looking Infra-Red (FLIR) project was proposed because the Army experienced frequent damage to the FLIR turret on the Blackhawk helicopter. A proposed a redesign to the (FLIR) turret is being implemented that will prevent damage. The Advanced Quicklook Guardrail (AQL) Radio Frequency (RF) Antenna Panel project was proposed because the Army experienced a higher than expected failure rate for RF antenna due to engine exhaust heating on the Guardrail aircraft. The solution is to design a replacement antenna that can better withstand the engine exhaust heat. The Special Operations Aviation (SOA) Common Avionics Architecture System (CAAS) Training Simulation project was developed in order to streamline software upgrades and maintenance, the Army demonstrated a common interface for the CAAS software which reduced O&M for software maintenance. The Multiple Launch Rocket System (MRLS) M270A1 V1Fire Control System (FCS) causes the Army to spend $57M annually for sustainment and to mitigate hardware and software obsolescence issues. The solution was to replace two obsolete electronic cards by upgrading other electronic cards on the vehicle. The UH-72A Main Rotor Blade Coating project evaluated and implemented a coating process to improve the reliabilityof the UH-72. The new coating and process will help protect the main rotor blade in harsh environments. The Hellfire Multi-Mode Warhead project developed a new combined warhead to accept three different warhead configurations into a single package for the Hellfire missile. Navy Projects: In FY10 the Navy completed ten projects and started two new Common Ship projects. The primary theme for FY10 projects was the improvement of maintenance technologies that would reduce operational cost and add efficiency to surface ships. NAVSEA had several common ship projects which provided underwater hull condition-based maintenance, reduced maintenance requirements and improved warfighting readiness. NAVSEA also introduced the use of vapor corrosion inhibitors in ship voids and reduced the effects of corrosion causing moisture within voids in order to double the maintenance			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
interval. These projects included coating surface ship propellers, high solids antifoulant coating , cathodic protection of aluminum, surface profile tool, and underwater hull condition-based maintenance. NAVSEA worked with NAVAIR to design a new machine hinge replacement for Main Landing Gear door hinges to meet current loading requirements. Other projects were for aircraft systems and the aviation support equipment that provided support for them. These projects included F/A-18 SRA pinpoint routines, spectrometer modification, Common Management Information System (CMIS) TDSA-KITMIS migration, H-60 blade deice controller, and F/A-18E/F fiber optic cable restore. The Littoral Combat System (LCS) Program Management Office (PMO) developed and fielded the S1000/Shared Courseware Object Reference Model (SCORM) in order to integrate three separate training logistics, and technical data databases into one common shared database that reduced life cycle O&S costs by having only one repository for logistics and tech data. Air Force Projects: Completed all FY09 projects and began twelve new projects. The F-119 and F-110 engines used on F-16and F-22 had a high incidence of damage beyond their bendable limits due to foreign object damage or domestic object damage. The proposed solution was to develop and validate through prototyping a process for repairing single titanium and nickel blades that are part of the Integrally Bladed Rotor (IBR) and develop a process to reduce the need to replace the entire IBR assembly, if a single blade is damaged. Today, engine maintenance intervals are conservatively based on “typical” mission usage. This assumption results in engines that have been used for benign missions being removed from aircraft with significant life remaining and engines that have been used for abusive missions remain on wing too long, resulting in Unscheduled Engine Removals and In Flight Shutdowns. By making the Engine Structural Integrity Program intervals condition-based instead of time-based would extend engine removal intervals to 5,000 hours thereby reducing O&S costs. The Field Backstop Test Data Collection and Analysis System solved the problem associated with depot maintenance of F-16 avionics boxes sent from the field to the depot for repair. The purpose of this effort was to develop a system for the collection, storage, retrieval, and analysis of F-16 Improved Avionics Intermediate Shop (IAIS) field backshop test data. DoD depots did not possess a clean, safe, environmental friendly and energy efficient method to remove Tungsten Carbide Cobalt (WC/Co) & Tungsten Carbide Cobalt Chrome (WC/Co/Cr) coatings from high strength steel parts. This project sought to expand the insertion of technology for the removal of WC/Co and WC/Co/Cr which was being applied to landing gear components. The USAF condemned many C-5 yokes, B-52 outer cylinders, KC-135 nose outer cylinders, and light-weightaircraft aluminum strut outer cylinders, which cost approximately $3M per year. A proposed solution was to develop and prototype a process to repair these landing gear cylinders using the magnetron sputtering process. The USAF destructively removed expensive thermal tiles to measure resistive card in the B-2 Hot Trailing Edge area. The proposed solution was to provide an organic solution for low observable maintainability of aircraft coatings by developing and prototyping a portable tool to organically inspect low observable tiles. ***FY 2011 Plans:***			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
In FY11 OSD will transition the program to the Services. OSD will only fund those projects that will be completed during FY11. There will be no R-TOC funded carry-over projects into FY12. The Services will assume responsibility for the program in FY12. The primary objective for the projects listed below will continue to be the reduction of operations and support (O&S) costs for the affected systems. Army Projects: The Army will continue six FY10 projects and completed these projects in FY11. The HH-60 FLIR work will continue to redesign the HH-60 FLIR turret to prevent damage during hovering and landings by reducing the size of the turret. The SOF CAAS will continue work to demonstrate a common interface for the Common Avionics Architecture System (CAAS) software. The goal is to integrate the CAAS interface solution into existing and future virtual flight training simulators significantly reducing the costs to modify, recompile and port training simulation software. The UH-72A project will continue to evaluate and implement a coating process to improve the reliability of the UH-72A main rotor blade in harsh environments. The Hellfire Warhead missile need to carry multiple warhead models adds unnecessary operational burden. The Army is proposing to develop a new combined warhead to accept three different warhead configurations into a single package for the Hellfire missile replacing the current three variants. Navy Projects: The Navy continues one FY10 project and will start and complete 10 new projects in FY11. The primary themes for FY11 are power conservation, better corrosion control through improved surface coatings, and maintenance cost reductions through streamlining. Currently general illumination standards employ the use of fluorescent and incandescent lighting fixtures with short service life and are energy inefficient. One of the conservation projects include the replacement of legacy fluorescent lighting with LED lighting on test ship (USS PEARL HARBOR) to lower maintenance and energy costs,. LHA-1 and LHD-1 Class Ships have directional stability issues. Tests with other types of ships have shown that appendages installed to eliminate these maneuvering issues reduce total energy costs by improving the steering. The Navy proposes to reduce weight and maintenance costs by eliminating some current Electronic Cooling Water systems on DDG 51 and CG 47 Class Surface Combatants to reduce weight and chill water system load requirements. These systems will use the ship's chilled water instead of demineralized electronic cooling water. To control corrosion O&S costs the Navy proposes the use of prototype cameras in shipboard tank voids to analyze condition and structural degradation eliminating the need to open tank. The Navy also proposes to test alternative corrosion coatings on shipboard crash-cranes to reduce excessive corrosion related maintenance costs. The Navy is proposing to redesign the night vision goggles used in tactical aircraft because ½ AA batteries are very expensive compared to AA alkaline batteries and are not readily available aboard ship or while forward deployed. The deliverable will be a redesigned AN/AVS-9 mount capable of using AA alkaline batteries, increased durability, and better EMI performance. NAVSEA is introducing the usage of conditioned based maintenance practices in the new LCS class ships and mission modules to help control O&S costs. NAVSEA is proposing upgrading high-maintenance components in shipboard munitions transporters to reduce maintenance requirements.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2010	FY 2011	FY 2012
This project will extend the periodic maintenance to a 5-year minimum and extend the service life of current assets to 25 years. NAVAIR is proposing to establish common procedures and practices for Airborne ForceNet (Afn) network maintenance, trouble shooting and updates. This will be applied immediately to EP-3, and P-3AIP platforms and will extend to P-8A, and BAMS. The Next Gen Navy Cash project will leverage the industry electronic banking advances to streamline shipboard banking and expenditure transactions for Sailors at sea. The potential savings are equivalent to 31% of existing program costs. Air Force Projects: The USAF will continue eleven projects started in FY10 and complete the projects in FY11. Nine projects are applicable across multiple systems to leverage investment funding. The projects that continue are improving maintenance of the F-119 jet engine Integrally Bladed Rotor, eight projects that focus on improving mid-level and depot level processes, and identify and qualify laser based alternatives to TIG, MIG, & EB manual welding processes for repairing F-15 and F-16,			
Accomplishments/Planned Programs Subtotals	22.870	20.310	-

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

There was an annual USD(AT&L) call for proposed project plans in October. Projects are submitted by the Services annually in January. The project plan format was provided with the call for submission of Service projects. Each project plan contained:

1. Problem statement
2. Impact statement
3. Technical description
4. Risk analysis
5. Proposed phases
6. Expected deliverables and results or outcomes
7. Program management
8. Cost/benefit analysis
9. Schedule
10. Implementation plan

The project evaluation criteria were also provided as part of the call for use by the Services in arriving at their prioritized project list.

In FY12 the Services will be responsible for implementing procedures for selecting projects and funding the R-TOC program.

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E. Performance Metrics

Not applicable.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2012 Office of Secretary Of Defense			DATE: February 2011
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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
RTOC	TBD	TBD:TBD	24.447	20.310		-		-		-	16.104	60.861	
		Subtotal	24.447	20.310		-		-		-	16.104	60.861	

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
		Subtotal	-	-		-		-		-	0.000	0.000	0.000

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
		Subtotal	-	-		-		-		-	0.000	0.000	0.000

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
		Subtotal	-	-		-		-		-	0.000	0.000	0.000

	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	24.447	20.310		-		-		-	16.104	60.861	

Remarks