

# UNCLASSIFIED

## CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification							DATE:	
							February 2004	
APPROPRIATION/BUDGET ACTIVITY					R-1 ITEM NOMENCLATURE			
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-4					0603573N/ADVANCED SURFACE MACHINERY			
COST (\$ in Millions)		FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total PE Cost		2.807	6.534	0.000	0.000	0.000	0.000	0.000
1314/Advanced Surface Machinery Programs		2.807	1.452	0.000	0.000	0.000	0.000	0.000
9043/Material Advanced Metalic Material Adv Dev		0.000	3.400	0.000	0.000	0.000	0.000	0.000
9355/Dockside Abrasive Waterjet Cutting		0.000	1.682	0.000	0.000	0.000	0.000	0.000
Defense Emergency Response Funds (DERF) Funds: Not Applicable.								
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:								
(U) Advanced Surface Machinery Programs develop affordable advanced machinery and subsystems for surface ship propulsion, electric and auxiliary requirements. The ICR Gas Turbine Engine is a marine propulsion gas turbine. ICR will reduce life cycle fuel cost and provide an alternate prime mover candidate. A contract for ICR Advanced Development (AD) with an option for Full Scale Development was awarded to Westinghouse Electric Corporation in December 1991. The ICR is derived from the Rolls-Royce RB211 aircraft engine and through the introduction of an intercooler, recuperator, and variable area nozzles achieves approximately a 25% to 27% propulsion annual fuel savings when compared to the LM2500 on a mechanical drive ship.								
(U) ICR full scale system development testing began in July 1994 and completed at Pyestock, U.K. on 30 April 1999. An additional 457 hours of testing at NAVSSES Philadelphia which completed 16 December 1999, confirmed readiness for qualification testing. Recuperator recovery efforts continued following the failure in January 1995 of the initial recuperator. An Engineering Development Model (EDM) recuperator, which is the exhaust heat recovery unit that provides most of the fuel efficiency gains, was delivered to the test site in January 1999. Testing on this EDM has met expectations. System testing to date has completed over 2400 hours of successful testing including over 1150 hours with the second generation recuperator and 1250 hours with the EDM recuperator. The engine system failed the endurance qualification testing in FY02.								
(U) A Cooperative Agreement between the United Kingdom (U.K.) and United States governments was signed by USD(A&T) on 21 June 1994 and revised in March 1997 and again in November 2000 for in-kind and cash contributions to the ICR program. A Cooperative Agreement between the French and United States governments was signed by ASN(RD&A) on 30 August 1995 and revised in October 2000 for in-kind and cash contributions to the ICR program. Under the terms of the MoU, the U.K. is proceeding with the shock testing which is currently planned for FY04.								
(U) Project 9043 - Congressional Add. This project funds the Metallic Material Advanced Development and Certification Program.								
(U) Project 9355 - Congressional Add. This project funds the Dockside Abrasive Waterjet Cutting.								

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Exhibit R-2, RDTEN Budget Item Justification  
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EXHIBIT R-2, RDT&E Project Justification			DATE: <b>February 2004</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA 4</b>	PROGRAM ELEMENT NUMBER AND NAME 0603573N/ADVANCED SURFACE MACHINERY SYS	PROJECT NUMBER AND NAME 1314 / 9043 / 9355 ADVANCED SURFACE MACHINERY PROGRAMS		
<b>B. Accomplishments/Planned Program</b>				
		FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost		0.000	0.000	0.000
RDT&E Articles Quantity				
<p>The Royal and French navies continued execution of the 3000 hour endurance qualification test. Engine sustained a failure which resulted in the requirement for a complete hot section rebuild and the termination of the endurance qualification test. U.S. Navy responsibilities included participation in the Steering Committee, technical review, monitoring tests and accepting test results for compliance to U.S. Navy requirements. Continued ICR technology application studies. The Royal and French navies initiated the shock test with a planned completion in FY04.</p>				
		FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost		2.807	0.000	0.000
RDT&E Articles Quantity				
<p>The Royal and French navies will complete the design modifications required to correct the deficiencies identified in the testing program, perform acceptance tests to verify the efficacy of the design changes and proceed with the preparation for the shock test.</p>				
		FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost		0.000	1.452	0.000
RDT&E Articles Quantity				
<p>The Royal and French navies will complete the shock test and post qualification test inspections.</p>				
		FY 03	FY 04	FY 05
Accomplishments/Effort/Subtotal Cost		0.000	5.082	0.000
RDT&E Articles Quantity				
<p>The goal of project 9043 (Congressional Add) funds the Metallic Material Advanced Development and Certification Program. The goal of project 9355 (Congressional Add) is to develop and demonstrate the ability to perform abrasive water jet cutting at the dockside or in a dry-dock setting. While this process is capable of cutting through thick substrate, such as that found in ship hulls, currently existing equipment is designed solely for use on the shop floors of manufacturing facilities. The prototype piece of equipment will demonstrate the ability to cut an access panel into a ship or submarine hull at dockside without producing noxious fume, to controlling and collecting the working fluid and to completing this task without the threat of a fire.</p>				

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**Exhibit R-2a, RDTEN Project Justification**  
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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>	PROGRAM ELEMENT NUMBER AND NAME 0603573N/ADVANCED SURFACE MACHINERY SYSTEMS	PROJECT NUMBER AND NAME 1314/ADVANCED SURFACE MACHINERY PROGRAMS		
<b>C. PROGRAM CHANGE SUMMARY:</b>				
Funding:		FY 2003	FY 2004	FY 2005
Previous President's Budget (FY 04 Pres Controls):		2.867	1.468	0.000
Current BES/President's Budget: (FY05 President Controls)		2.807	1.452	0.000
Total Adjustments		-0.060	-0.016	0.000
Summary of Adjustments				
Congressional Adjustments		0.000	0.000	0.000
Inflation Adjustments		0.000	0.000	0.000
Reprogrammings		0.000	0.000	0.000
Minor adjustments		-0.060	-0.016	0.000
Subtotal		-0.060	-0.016	0.000
Schedule:				
Not Applicable				
Technical:				
Not Applicable				

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APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>		PROGRAM ELEMENT NUMBER AND NAME 0603573N/ADVANCED SURFACE MACHINERY SYS			PROJECT NUMBER AND NAME 1314/ADVANCED SURFACE MACHINERY PROGRAMS					
<b>D. OTHER PROGRAM FUNDING SUMMARY:</b>										
<u>Line Item No. &amp; Name</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>FY 2004</u>	<u>FY 2005</u>	<u>FY 2006</u>	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2009</u>	<u>To Complete</u>	<u>Total Cost</u>
None										
<b>E. ACQUISITION STRATEGY:</b>										
Shock testing will occur in FY 2004. Program ends in FY 2004.										
<b>F. MAJOR PERFORMERS:</b>										
Northrop Grumman Marine Systems, Sunnyvale California, Prime contractor award date December 1991 David Taylor Research and Development Center/Carderock Division/ Philadelphia Detachment. Testing Support, annual										

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Exhibit R-3 Cost Analysis (page 1)										DATE: <b>February 2004</b>		
APPROPRIATION/BUDGET ACTIVITY <b>RDT&amp;E, N / BA-4</b>			PROGRAM ELEMENT 0603573N/ADVANCED SURFACE MACHINERY SYS			PROJECT NUMBER AND NAME 1314/ADVANCED SURFACE MACHINERY PROGRAMS						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPAF	NG, Sunnyvale, Ca	339.561	0.587	10/02						340.148	
Ancillary Hardware Development											0.000	
Component Development											0.000	
Ship Integration											0.000	
Ship Suitability											0.000	
Systems Engineering	C/CPAF	NG, Sunnyvale, Ca	1.548	0.960	various	0.674	various				3.182	
Training Development											0.000	
Licenses											0.000	
Tooling											0.000	
Cost Improvements			7.000								7.000	
Award Fees	C/CPAF	NG, Sunnyvale, Ca	8.823								8.823	
Subtotal Product Development			356.932	1.547		0.674		0.000		0.000	359.153	
Remarks:												
Development Support											0.000	
Software Development											0.000	
Training Development											0.000	
Integrated Logistics Support											0.000	
Configuration Management											0.000	
Technical Data											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks:												

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Exhibit R-3, Project Cost Analysis  
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Exhibit R-3 Cost Analysis (page 2)								DATE: February 2004				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME						
RDT&E, N / BA-4			0603573N/ADVANCED SURFACE MACHINERY SYS			1314/ADVANCED SURFACE MACHINERY PROGRAMS						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC Philadelphia PA	16.169	1.210	10/02	0.728	10/03				18.107	
Operational Test & Evaluation											0.000	
Live Fire Test & Evaluation											0.000	
Test Assets											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal T&E			16.169	1.210		0.728		0.000		0.000	18.107	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support											0.000	
Travel			0.050	0.050	various	0.050	various				0.150	
Labor (Research Personnel)											0.000	
SBIR Assessment											0.000	
Subtotal Management			0.050	0.050		0.050		0.000		0.000	0.150	
Remarks:												
Total Cost			373.151	2.807		1.452		0.000		0.000	377.410	
Remarks:												

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EXHIBIT R4, Schedule Profile																								DATE:											
APPROPRIATION/BUDGET ACTIVITY												PROGRAM ELEMENT NUMBER AND NAME												PROJECT NUMBER AND NAME											
RDT&E, N / BA-04												0603573N/ADVANCED SURFACE MACHINERY SYS												1314/ADVANCED SURFACE MACHINERY PROGRAMS											
Fiscal Year	2002				2003				2004				2005				2006				2007				2008				2009						
	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							
Acquisition Milestones		Not Applicable																																	
Test & Evaluation		Endurance testing Ends ▲									Shock Test ▲																								

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\* Not required for Budget Activities 1, 2, 3, and 6

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**Exhibit R-4a, Schedule Detail**  
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