

# UNCLASSIFIED

**CLASSIFICATION:**

EXHIBIT R-2, RDT&E Budget Item Justification							DATE: <b>February 2005</b>	
APPROPRIATION/BUDGET ACTIVITY <b>RESEARCH DEVELOPMENT TEST &amp; EVALUATION, NAVY / BA-4</b>					R-1 ITEM NOMENCLATURE 0603573N/ADVANCED SURFACE MACHINERY			
COST (\$ in Millions)	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Total PE Cost	6.461	3.367	0.000	0.000	0.000	0.000	0.000	0.000
1314/Advanced Surface Machinery Programs	1.428	0.000	0.000	0.000	0.000	0.000	0.000	0.000
9043/Material Advanced Metalic Material Adv Dev	3.397	3.367	0.000	0.000	0.000	0.000	0.000	0.000
9355/Dockside Abrasive Waterjet Cutting	1.636	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>Defense Emergency Response Funds (DERF) Funds:</b> Not Applicable.								
<b>A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:</b> (U) Advanced Surface Machinery Programs develop affordable advanced machinery and subsystems for surface ship propulsion, electric and auxiliary requirements. The Intercooled Recuperated (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 terms of the MoU, the U.K. is planning to accomplish the shock testing in FY05.  (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, RDT&E Project Justification			DATE: <b>February 2005</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 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	1.428	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 FY05.</p>				
	FY 04	FY 05	FY 06	FY 07
Accomplishments/Effort/Subtotal Cost	5.033	3.367		
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 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 fumes, to controlling and collecting the working fluid and to completing this task without the threat of a fire.</p>				

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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	

  

**C. PROGRAM CHANGE SUMMARY:**

	FY 2004	FY 2005	FY 2006	FY 2007
Funding:				
FY2005 President's Budget	1.432	0.000	0.000	0.000
FY 2006/2007 President's Budget	1.428	3.367	0.000	0.000
Total Adjustments	-0.004	3.367	0.000	0.000
Summary of Adjustments				
Miscellaneous Cuts	-0.004	-0.001	0.000	0.000
Congressional Adjustments		-0.032	0.000	0.000
Subtotal	-0.004	-0.033	0.000	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			

**D. OTHER PROGRAM FUNDING SUMMARY:**

Line Item No. & Name	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	To Complete	Total Cost
None										

**E. ACQUISITION STRATEGY:**

Shock testing will occur in FY 2005. Program ends in FY 2005.

**F. MAJOR PERFORMERS:**

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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## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)										DATE: <b>February 2005</b>				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NUMBER AND NAME								
<b>RDT&amp;E, N / BA-4</b>			0603573N/ADVANCED SURFACE MACHINERY SYS			1314/ADVANCED SURFACE MACHINERY PROGRAMS								
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	FY 07 Cost	FY 07 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPAF	NG, Sunnyvale, Ca	340.148										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	2.508	0.150	11/03								2.658	
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			358.479	0.150		0.000		0.000				0.000	358.629	
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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## CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)										DATE: <b>February 2005</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 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	FY 06 Cost	FY 06 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC Philadelphia PA	17.375	1.256	10/03						18.631	
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			17.375	1.256		0.000		0.000		0.000	18.631	
Remarks:												
Contractor Engineering Support											0.000	
Government Engineering Support											0.000	
Program Management Support											0.000	
Travel			0.100	0.022	various						0.122	
Labor (Research Personnel)											0.000	
SBIR Assessment											0.000	
Subtotal Management			0.100	0.022		0.000		0.000		0.000	0.122	
Remarks:												
Total Cost			375.954	1.428		0.000		0.000		0.000	377.382	
Remarks:												

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EXHIBIT R4, Schedule Profile																								DATE:				February 2005							
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	2004				2005				2006				2007				2008				2009								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	1	2	3	4			
Acquisition Milestones																																			
Test & Evaluation							Shock Test ▲																												

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

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