CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification						DATE: **February 2002**			
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-4**				R-1 ITEM NOMENCLATURE 0603573N/ADVANCED SURFACE MACHINERY					
COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Total PE Cost	**9.226**	**3.886**	**2.931**	**1.533**	**0.000**	**0.000**	**0.000**	**0.000**	**382.510**
Advanced Surface Machinery/S1314	**5.342**	**3.886**	**2.931**	**1.533**	**0.000**	**0.000**	**0.000**	**0.000**	**378.626**
Naval Ship Survivability/32761	**3.884**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**3.884**
Quantity of RDT&E Articles									

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: Advanced Surface Machinery Programs develop affordable advanced machinery and subsystems for surface ship propulsion, electric and auxiliary requirements.

(U) Project S1314- The ICR Gas Turbine Engine program, 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 (now Northrop Grumman Marine Systems) 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) Project 32761 - The funding will be used to demonstrate advanced open system architectures and controls to further improve electrical power reliability to mission critical loads and further reduce platform costs.

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APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA4**	R-1 ITEM NOMENCLATURE 0603573N/ADVANCED SURFACE MACHINERY

B. (U) PROGRAM CHANGE SUMMARY:

	FY 2001	FY 2002	FY 2003
(U) FY 2002 President's Budget:	9.547	3.921	
(U) Appropriated Value:	9.635	3.921	
(U) Adjustment to FY 2001/2002 Appropriated value/ FY 2002 President's Budget:	-0.321	-0.035	
(U) FY 2003 Pres Budget Submit:	9.226	3.886	2.931

(U) Funding: FY2001: Adjustments: FY 01 SBIR (-$.197M), ASN RDA BTR (-$.110M) and Minor adjustments (-$.014M).

FY 2002: Adjustments: Minor adjustment (-$.035M).

(U)Schedule: ICR - No change. IPS program transitioned to P.E. 0603513N/Project 32471 in FY 2000.

(U) Technical: IPS program transitioned to P.E. 0603513N/Project 32471 in FY 2000. In FY 2000, the ICR program transitioned the qualification portion of program to Allied countries for completion.

C. (U) OTHER PROGRAM FUNDING SUMMARY: N/A

EXHIBIT R-2a, RDT&E Project Justification						DATE: **February 2002**			
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N/BA-4**	PROGRAM ELEMENT NAME AND NUMBER ADVANCED SURFACE MACHINERY/PE 0603573N			PROJECT NAME AND NUMBER ICR-Gas Turbine Engine/S1314					
COST ($ in Millions)	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost	**5.342**	**3.886**	**2.931**	**1.533**	**0.000**	**0.000**	**0.000**	**0.000**	**378.626**
RDT&E Articles Qty									

A. (U) MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: 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. Tests to date have met objectives.

(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.

(U) The FY 1999 funds for Integrated Power Systems (IPS) were budgeted and executed under P.E. 0603573N/Project S1314. IPS funding has transitioned to P.E. 0603513N/Project 32471 for both budget and execution in FY 2000 and out.

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2002**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E,N/BA-4	**ADVANCED SURFACE MACHINERY/PE 0603573N**	**ICR-GAS TURBINE ENGINE/S1314**

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. (U) FY 2001 ACCOMPLISHMENTS:

(U) ($5.342) ICR: The Royal and French navies initiated the 3000 hour endurance qualification test, which will require approximately eighteen months. U.S. Navy responsibilities include participation in the Steering Committee, technical review, monitoring tests and accepting test results for compliance to U.S. Navy requirements. The U.S. Navy initiated closing the development testing portion of the contract with Northrop Grumman Marine Systems. Initiated power production studies assessing the application of ICR technology.

2. (U) FY 2002 PLAN:

(U) ($3.886) ICR: The Royal and French navies will continue execution of the 3000 hour endurance qualification test and initiated a shock test. U.S. Navy responsibilities will include participation in the Steering Committee, technical review, monitoring tests and accepting test results for compliance to U.S. Navy requirements. Continue ICR technology application studies.

3. (U) FY 2003 PLAN:

(U) ($2.931) ICR: The Royal and French navies will complete the shock test and post qualification test inspections.

B. (U) OTHER PROGRAM FUNDING SUMMARY: N/A

C. (U) ACQUISTION STRATEGY: ICR is a candidate system for DD-21.

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2002**
APPROPRIATION/BUDGET ACTIVITY **RDT&E,N/BA-4**	PROGRAM ELEMENT NAME AND NUMBER **ADVANCED SURFACE MACHINERY/0603573N**	PROJECT NAME AND NUMBER **ICR-Gas Turbine Engine/S1314**

D. Schedule Profile:

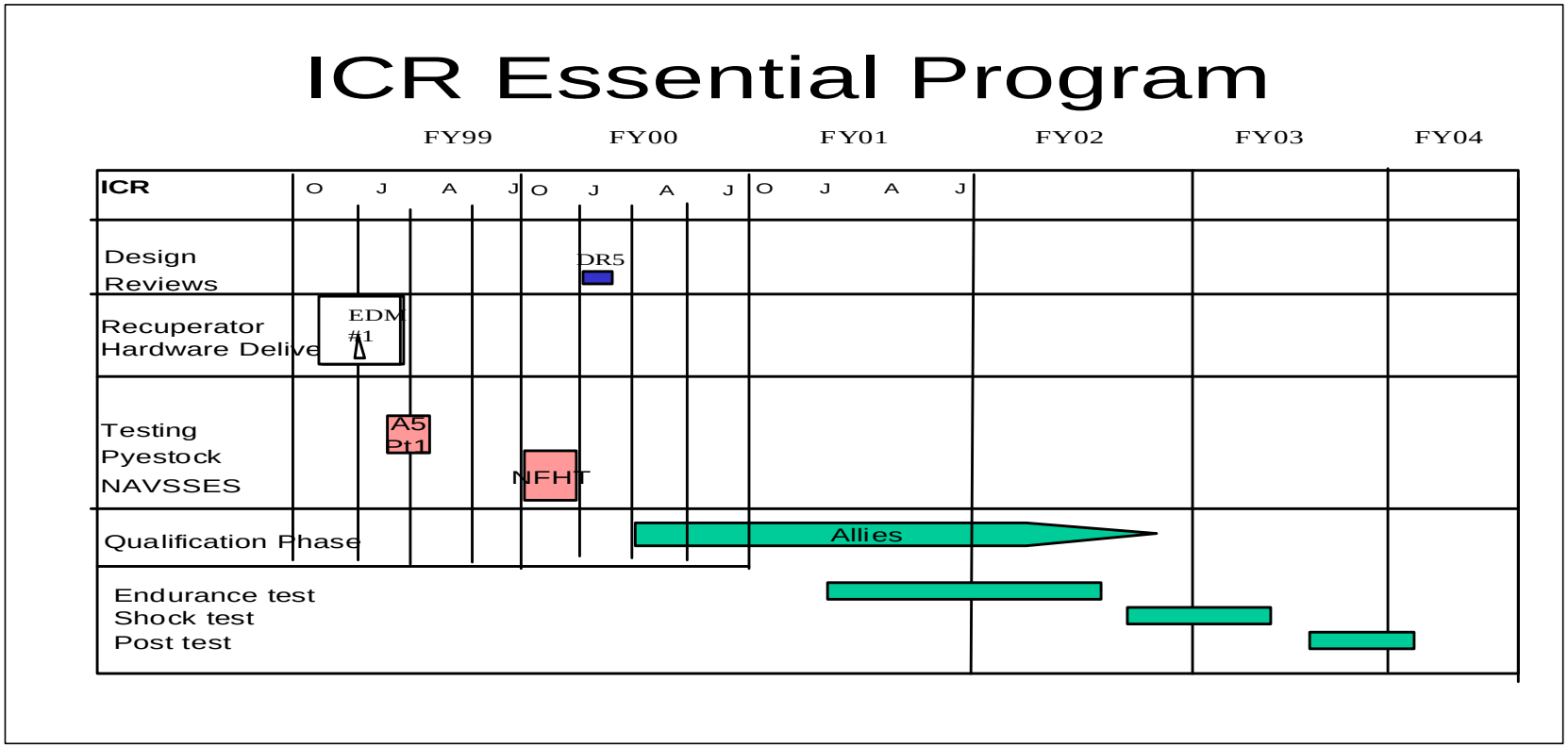

Exhibit R-3 Cost Analysis (page 1) | DATE: **February 2002**

APPROPRIATION/BUDGET ACTIVITY: **RDT&E, N/BA4** | PROGRAM ELEMENT: **0603573N** | PROJECT NAME AND NUMBER: **ADVANCED SURFACE MACHINERY/S1314**

Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development	C/CPAF	NG, Sunnyvale, CA	335.014	3.842	Oct 00	1.500	Oct 01	0.600	Oct 02		340.956	
Ancillary Hardware Development											0.000	
Systems Engineering	C/CPAF	NG, Sunnyvale, CA								0.283	0.283	
	C/CPAF	Other Contractor	0.358	0.054	N/A	1.136	various	0.981	various	0.200	2.729	
Licenses											0.000	
Tooling											0.000	
Cost Improvement			7.000								7.000	
Award Fees	CC[AF	NG, Sunnyvale, CA	8.823							0.000	8.823	
Subtotal Product Development			351.195	3.896		2.636		1.581		0.483	359.791	

Remarks:

Development Support Equipment												
Software Development												
Training Development												
Integrated Logistics Support												
Configuration Management												
Technical Data												
GFE												
Subtotal Support												

Remarks:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2002**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N**		PROGRAM ELEMENT **0603573N**				PROJECT NAME AND NUMBER ADVANCED SURFACE MACHINERY/S1314						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 Cost	FY01 Award Date	FY 02 Cost	FY 02 Award Date	FY 03 Cost	FY 03 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Developmental Test & Evaluation	WR	NSWC Philadelphia, MD	13.739	1.400	Oct 00	1.200	Oct 01	1.300	Oct 02	1.000	18.639	
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			13.739	1.400		1.200		1.300		1.000	18.639	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support												
Travel				0.046	Various	0.050	Various	0.050	Various	0.050	0.196	
Labor (Research Personnel)												
Overhead												
Subtotal Management				0.046		0.050		0.050		0.050	0.196	
Remarks:												
Total Cost			364.934	5.342		3.886		2.931		1.533	378.626	
Remarks:												