

CLASSIFICATION:**UNCLASSIFIED****EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION**

DATE

February 2008

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

RD TEN/BA 4**0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT**

COST (In Millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	20.725	5.080	7.737	17.591	12.834	7.925	8.091
0099 / Deep Submergence Bio Med Dev	2.983	3.299	3.286	3.363	3.388	3.986	4.064
0394 / Shallow Depth Diving EQ	17.742	1.781	4.451	14.228	9.446	3.939	4.027

A. MISSION DESCRIPTION:

Developments in this program will enable the U.S. Navy to overcome deficiencies that constrain underwater operations in the areas of search, location, rescue, recovery, salvage, construction, and protection of offshore assets. This program develops medical technology, diver life support equipment, and the vehicles, systems, tools, and procedures to permit manned underwater operations.

B. PROGRAM CHANGE SUMMARY:

Funding:	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY08 Pres Budget Controls)	20.725	5.122	7.737
Current BES/President Budget (FY09 Pres Budget Controls)	20.725	5.080	7.737
Total Adjustment	0.000	-0.042	0.000
Summary of Adjustments:	FY2007	FY2008	FY2009
Execution Realignment SB Issue	0.000	-0.009	0.000
Contractor Efficiencies	0.000	-0.008	0.000
Revised Economic Assumption	0.000	-0.025	0.000
Subtotal	0.000	-0.042	0.000

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE February 2008		
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT			PROJECT NUMBER AND NAME 0099/Deep Submergence Bio Med Dev		
COST (In Millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost	2.983	3.299	3.286	3.363	3.388	3.986	4.064
RDT&E Articles Qty	0	0	0	0	0	0	0
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:							
<p>Develops advanced biomedical and bioengineering technology for enhancing medical and life support for submarine escape and rescue; and for diver safety and effectiveness; supports deeper, longer, and more flexible dives. Deliverables for DISSUB (disabled submarine) include: medical procedures for submarine escape and rescue (including new Submarine Rescue Diving and Recompression System (SRDRS)), life support parameters, medical procedures for life support, exposure guidance for atmospheric contaminants, non-chemical CO2 scrubbing, prevention and treatment of decompression illness, and senior survivor expert decision system. Deliverables for diver enhancement include: exposure guidance for diver underwater continuous noise, impulse noise, and underwater blast, exposure guidance for oxygen breathing, collection of operational diving depth/time profiles to predict decompression risk, and enhanced underwater swimming efficiency. Requirements: NAPDD #587-873, Deep Submergence Biomedical Development, 23 November 1999.</p>							

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B. ACCOMPLISHMENTS/PLANNED PROGRAM:				
		FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost		1.687	2.004	1.968
RDT&E Articles Quantity		0	0	0
Diver Health and Safety Research: Pulmonary oxygen toxicity exposure limits. Procedures for assessing and mitigating risk for diving in contaminated water. Procedure to determine remaining CO2 scrubber duration. Development of advanced insulation garments for diver thermal protection. Develop final guidance for warm water diving. Continue collection of operational dive profiles for advanced modeling. Submarine ballast tank air quality survey. Novel methods for diver thermal protection. Improve resistance to O2 toxicity. Diver anthropometry. Chemical hardening of diving equipment. Predictive index of visual and auditory O2 toxicity. Guidelines for flying after diving. Guidelines for infra- and ultra-sound diver exposure. Develop an advanced diver thermal model. Guidelines for ballast tank diving. Protective gear for diver noise exposure. Electronic collection of operational dive data.				
		FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost		1.296	1.295	1.318
RDT&E Articles Quantity		0	0	0
Submarine Rescue: Decompression procedures for pressurized SRDRS operators. Use of perfluorocarbons to accelerate decompression in submarine rescue. Adjunctive therapies for treating DISSUB survivors. Guidance for food, water, clothing, medical supplies to enhance survival of submarine crews awaiting rescue. Flexible computer generated decompression schedules for wide range of conditions in a DISSUB. Develop DISSUB triage procedures. DISSUB survival trial. Develop oxygen metabolizer for closed vehicles. Accelerate decompression by negative pressure breathing. Treatment guidance for decompression sickness and arterial gas embolism in submarine escape and rescue. Interventions for toxicological problems with rescued submariners. Minimizing decompression sickness and arterial gas embolism with Submarine Escape and Immersion Suit (SEIS) training. Use of pharmacologic agents to reduce decompression risk in submarine rescues.				
C. OTHER PROGRAM FUNDING SUMMARY: Not Applicable				
D. ACQUISITION STRATEGY: Integrated thrust area teams (e.g. decompression research) are established with university, commercial and in-house Navy lab to jointly execute biomedical R&D; peer review of research proposals accomplished by independent Technical Advisory Board; annual review of progress by Executive Review Board (CNO/NAVSEA/ONR/BUMED); program management by 0-6 Medical Dept Officer; contracting by competitive process using BAA and leveraging ONR capabilities.				
E. MAJOR PERFORMERS: Navy Experimental Diving Unit (NEDU) (Oct/each FY) is the center for manned diving biomedical research and development for the Navy. All Navy manned diving research facilities were consolidated at NEDU during the last BRAC.				

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EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS									DATE			
									February 2008			
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NUMBER AND NAME					PROJECT NUMBER AND NAME					
RD TEN/BA 4		0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT					0099/Deep Submergence Bio Med Dev					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)	FY 2007 Cost (\$000)	FY 2007 Award Date	FY 2008 Cost (\$000)	FY 2008 Award Date	FY 2009 Cost (\$000)	FY 2009 Award Date	Cost to Complete (\$000)	Total Cost (\$000)	Target Value of Contract
Primary Hardware Development			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Ancillary Hardware Development			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Component Development			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Ship Integration			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Ship Suitability			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Systems Engineering			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Training Development			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Licenses			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Tooling			0.000	0.000		0.000		0.000		0.000	0.000	0.000
GFE			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Award Fees			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Subtotal Product Development			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
Development Support			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Software Development			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Training Development			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Integrated Logistics Support			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Configuration Management			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Technical Data			0.000	0.000		0.000		0.000		0.000	0.000	0.000
GFE			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Award Fees			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Subtotal Support Costs			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Remarks:												
Developmental Test & Evaluation	WX	NEDU, Panama City, Fl.	2.942	2.772	OCT-06	3.101	OCT-07	3.059	OCT-08	0.000	11.874	0.000
Operational Test & Evaluation			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Live Fire Test & Evaluation			0.000	0.000		0.000		0.000		0.000	0.000	0.000

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Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)	FY 2007 Cost (\$000)	FY 2007 Award Date	FY 2008 Cost (\$000)	FY 2008 Award Date	FY 2009 Cost (\$000)	FY 2009 Award Date	Cost to Complete (\$000)	Total Cost (\$000)	Target Value of Contract
Test Assets			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Tooling			0.000	0.000		0.000		0.000		0.000	0.000	0.000
GFE			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Award Fee			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Subtotal Test and Evaluation			2.942	2.772		3.101		3.059		0.000	11.874	0.000
Remarks:												
Contractor Engineering Support			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Government Engineering Support			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Program Management Support			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Travel	Various	Various	0.000	0.033	TBD	0.020	TBD	0.049	TBD	0.000	0.102	0.000
Labor (Research Personnel)			0.000	0.000		0.000		0.000		0.000	0.000	0.000
*SBIR Assessment	Various	Various	0.000	0.178	TBD	0.178	TBD	0.178	TBD	0.000	0.534	0.000
Subtotal Management Services			0.000	0.211		0.198		0.227		0.000	0.636	0.000
Remarks: *SBIR Assessment includes other extramural program assessments.												
Total Cost			2.942	2.983		3.299		3.286		0.000	12.510	0.000

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APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT			PROJECT NUMBER AND NAME 0394/Shallow Depth Diving EQ		
COST (In Millions)	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Project Cost	17.742	1.781	4.451	14.228	9.446	3.939	4.027
RDT&E Articles Qty	0	0	0	0	0	0	0
A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:							
<p>This project is to develop systems to support submarine escape and rescue missions, and conventional diver operations. Diver operations include ship husbandry, salvage/recovery, and submarine rescue operations to support national, as well as, Navy needs around the world. Modern certifiable diving systems that ensure diver safety and allow maximum work efficiency will replace currently antiquated systems. Efforts are currently (through FY11) focused on the Submarine Rescue Diving and Recompression System (SRDRS) to provide a new rapidly deployed emergency submarine rescue capability. SRDRS will fill the gap created by the decommissioning of USS PIGEON (ASR 21) and USS ORTOLAN (ASR 22) and provide a new capability of pressurized transportation of rescuees from a stricken submarine directly to the decompression system eliminating the requirement for Deep Submergence Rescue Vehicles, Mother Submarines and Submarine Rescue Chambers. SRDRS is to include an air transportable rapid assessment/underwater work system, a decompression chamber system and a pressurized rescue module. The SRDRS will provide a global rapid response capability to support submarine rescue missions with an increase in capability at a fraction of the cost of the currently available systems.</p> <p>Shallow Depth Diving Equipment managed under SEA00C (FY08-FY11) - This project develops systems to support submarine escape and rescue missions, and conventional diver operations. Diver operations include ship husbandry, salvage/recovery, and submarine rescue operations to support national, as well as, Navy needs around the world. Modern certifiable diving systems that ensure diver safety and allow maximum work efficiency will replace currently antiquated systems. Current plans are to perform R&D in the areas of contaminated water diving in FY08-FY13.</p>							

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B. ACCOMPLISHMENTS/PLANNED PROGRAM:			
	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	17.742	0.598	3.163
RDT&E Articles Quantity	0	0	0
Continue fabrication and acceptance testing of the prototype Submarine Decompression System and support equipment. Complete design, complete fabrication and acceptance testing of prototype Pressurized Rescue Module and support equipment. Begin integration of all SRDRS components.			
	FY 2007	FY 2008	FY 2009
Accomplishments/Effort/Subtotal Cost	0.000	1.183	1.288
RDT&E Articles Quantity	0	0	0
R&D for contaminated water diving.			
C. OTHER PROGRAM FUNDING SUMMARY: Not Applicable			
D. ACQUISITION STRATEGY: The Submarine Rescue system (SRS) segment of the SRDRS is largely based on the use of Commercial-Off-the-Shelf (COTS) technology and maximum use of Non-Developmental Items (NDI). The SRS segment is being procured using performance based specifications. Many of the SRS contracts were awarded competitively and were based on technical capability and cost considerations (best value). Program management of SRDRS is accomplished through the use of Program Executive Officer, Submarines (PEO SUB) leadership. This change was enacted in February 2003 realigning the responsibility from SEA00C to PEOSUB. The Prototype system will provide full operational capability and no additional procurement is planned. The system is designed to be Government Owned/Commercially Operated (GO/CO).			
E. MAJOR PERFORMERS: Oceaneering International is providing systems engineering and integration support for the SRS. Oceanworks, Inc. is the detailed designer and fabricator of the Pressurized Rescue Module.			

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RD TEN/BA 4		0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT					0394/Shallow Depth Diving EQ					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)	FY 2007 Cost (\$000)	FY 2007 Award Date	FY 2008 Cost (\$000)	FY 2008 Award Date	FY 2009 Cost (\$000)	FY 2009 Award Date	Cost to Complete (\$000)	Total Cost (\$000)	Target Value of Contract
Primary Hardware Development			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Ancillary Hardware Development			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Design, System Integration	CPAF	Oceaneering, Hanover, MD	0.000	0.000		0.000		0.000		0.000	0.000	0.000
Decompression Chambers (SDC1 and 2)			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Various Mission Support Equipment (MSE)			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Pressurized Rescue Module System (PRMS)	CPIF	Oceanworks, Ottawa, Ontario, CAN	12.824	11.000	FEB-07	0.000		0.000		0.000	23.824	0.000
PRMS	FFP	Oceanworks, Ottawa, Ontario, CAN	0.000	4.000	APR-07	0.000		0.000		0.000	4.000	0.000
Various PRMS MSE			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Systems Engineering - Design, Integration	Various	Oceaneering, Hanover, MD	0.829	0.396	MAY-07	0.593	OCT-07	2.596	OCT-08	29.339	33.753	0.000
Systems Engineering - Technical	Various	Various	0.537	0.000		0.000		0.000		0.300	0.837	0.000
Licenses			0.000	0.000		0.000		0.000		0.000	0.000	0.000
GFE			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Award Fees			0.000	0.000		0.000		0.000		0.000	0.000	0.000
			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Subtotal Product Development			14.190	15.396		0.593		2.596		29.639	62.414	0.000
Remarks:												
1. Restructuring or rephrasing of non-rescue related subsystems and components done with N773 and CNSF staff concurrence.												
2. SDC-1 and SDC-2 chambers under a FFP contract through NFESC. Contract completion date (CCD) remains 31 August 2003 and was missed. Liquidated damages are being assessed per the FAR. A significant Request for Equitable Adjustment (REA) has been submitted and denied within NAVFESC. Further adjudication or financial liability to program is not included in controls.												
3. Adjustments for Oceanworks PRMS cost growth negotiated between NAVSEA 02 and Canadian Commercial Corporation; contract converted to Firm Fixed Price (FFP).												
Development Support	Various	Various	0.000	0.000		1.183	OCT-07	1.288	OCT-08	5.195	7.666	0.000
Software Development			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Integrated Logistics Support			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Integrated Logistics Support	Various	Various	0.841	0.000		0.000		0.000		0.000	0.841	0.000

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Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)	FY 2007 Cost (\$000)	FY 2007 Award Date	FY 2008 Cost (\$000)	FY 2008 Award Date	FY 2009 Cost (\$000)	FY 2009 Award Date	Cost to Complete (\$000)	Total Cost (\$000)	Target Value of Contract
Configuration Management	CPAF	Oceaneering, Hanover, MD	0.489	0.000	N/A	0.000		0.000		0.500	0.989	0.000
Technical Data			0.000	0.000		0.000		0.000		0.000	0.000	0.000
GFE			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Award Fees			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Subtotal Support Costs			1.330	0.000		1.183		1.288		5.695	9.496	0.000
Remarks:												
Developmental Test & Evaluation	Various	Various	2.762	0.393	MAY-07	0.000		0.000		0.000	3.155	0.000
Operational Test & Evaluation	WX	COMOPTEVFOR, Norfolk, VA	0.050	0.225	MAY-07	0.000		0.050	OCT-08	0.320	0.645	0.000
Subtotal Test and Evaluation			2.812	0.618		0.000		0.050		0.320	3.800	0.000
Remarks:												
Contractor Engineering Support	Various	QBS/Various	0.074	0.000		0.000		0.000		0.000	0.074	0.000
Government Engineering Support	WX	NFESC, Port Hueneme, CA	0.106	0.091	JAN-07	0.000		0.000		0.000	0.197	0.000
Government Engineering Support	WX	PSNSY, Bremerton, WA	0.339	0.747	JAN-07	0.000		0.096	OCT-08	0.000	1.182	0.000
Government Engineering Support	Various	Various	1.360	0.326	FEB-07	0.000		0.000		0.000	1.686	0.000
Program Management Support	Various	Various	0.267	0.439	JAN-07	0.000		0.381	OCT-08	1.121	2.208	0.000
Travel	Various	Various	0.075	0.125	TBD	0.005	TBD	0.040	TBD	0.150	0.395	0.000
SBIR Assessment	Various	Various	0.443	0.000	N/A	0.000		0.000		0.000	0.443	0.000
Government Engineering Support			0.000	0.000		0.000		0.000		0.000	0.000	0.000
Subtotal Management Services			2.664	1.728		0.005		0.517		1.271	6.185	0.000
Remarks: *SBIR Assessment includes other extramural program assessments												
Total Cost			20.996	17.742		1.781		4.451		36.925	81.895	0.000

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UNCLASSIFIED

EXHIBIT R-4, SCHEDULE PROFILE

DATE

February 2008

APPROPRIATION/BUDGET ACTIVITY
RDTEN/BA 4

PROGRAM ELEMENT NUMBER AND NAME
0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT

PROJECT NUMBER AND NAME
0394/Shallow Depth Diving EQ

Fiscal Year	2007				2008				2009				2010				2011				2012				2013							
	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																																
Design/Development Submarine Decompression System (SDS)																																
Delivery: (1) Rescue (2) Transfer Under Pressure (TUP)																																
Configuration Audits Physical Configuration Audits Functional Configuration Audits																																
Test & Evaluation Milestones Development Test: (1) SDS (2) TUP (3) PRMS Operational Test: (1) SDS (2) TUP (3) PRMS																																
Production Milestones Deliveries TUP Issue Resolution and Optimization																																

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EXHIBIT R-4a, SCHEDULE DETAIL						DATE February 2008		
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT			PROJECT NUMBER AND NAME 0394/Shallow Depth Diving EQ			
Schedule Profile		FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Milestone II (MSII)								
Detail Design/Development and Fab (SDS - SDC, PFMS, DTL)		1Q-4Q	1Q-4Q	1Q-4Q	1Q-4Q			
Detail Design/Devel. and Fab (PRMS)		1Q-2Q						
Critical Design Review (CDR) - PRMS								
Physical Configuration Audit - SDC		2Q						
Hardware Delivery - SDC-1 and SDC-2		3Q						
Functional Configuration Audit (FCA) - PRM		2Q						
Developmental Testing (DT-SDS)			1Q-2Q					
Physical Configuration Audit - PRM		3Q						
Hardware Delivery - PRMS		2Q						
Developmental Testing (DT-PRMS)		2Q-3Q						
Operational Testing (OPEVAL-PRMS)		4Q	1Q					
Acquisition Capability Delivery - Rescue Ready			2Q					
Hardware Delivery - DTL					2Q-3Q			
Developmental Testing (DT-TUP)					4Q	1Q		
Operational Testing (OT-TUP)						1Q-2Q		
Acquisition Capability Delivery - TUP						2Q-3Q		
First Deployment (Rescue Ready (DSRV equiv.))			2Q					
First Deployment (Fly Away Recompression w/TUP)						3Q		
First Deployment Full-Up SRDRS						3Q		
Initial Operational Capability (IOC) of Full-Up SRDRS						3Q		
TUP Issue Resolution and Optimization							1Q-4Q	1Q-4Q