

CLASSIFICATION:**UNCLASSIFIED****EXHIBIT R-2, RDT&E BUDGET ITEM JUSTIFICATION**DATE
May 2009

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

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

COST (In Millions)

FY 2008

FY 2009

FY 2010

Total PE Cost

8.812

7.716

17.328

0099 / Deep Submergence Bio Med Dev

3.295

3.277

3.313

0394 / Shallow Depth Diving EQ

5.517

4.439

14.015

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 2008	FY 2009	FY 2010
FY09 President's Budget	5.080	7.737	17.591
FY10 President's Budget	8.812	7.716	17.328
Total Adjustments	3.732	-0.021	-0.263
(U) Summary of Adjustments			
Congressional Adjustments	0.000	-0.021	0.000
Program Adjustments	3.732	0.000	0.000
Rate/Misc Adjustments		0.000	-0.263
Total	3.732	-0.021	-0.263

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
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 2008	FY 2009	FY 2010				
Project Cost	3.295	3.277	3.313				
RDT&E Articles Qty	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 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	2.000	1.959	1.967
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 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.295	1.318	1.346
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					
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 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date		Total Cost (\$000)	Target Value of Contract		
Primary Hardware Development			0.000			0.000		0.000						
Ancillary Hardware Development			0.000			0.000		0.000						
Component Development			0.000			0.000		0.000						
Ship Integration			0.000			0.000		0.000						
Ship Suitability			0.000			0.000		0.000						
Systems Engineering			0.000			0.000		0.000						
Training Development			0.000			0.000		0.000						
Licenses			0.000			0.000		0.000						
Tooling			0.000			0.000		0.000						
GFE			0.000			0.000		0.000						
Award Fees			0.000			0.000		0.000						
Subtotal Product Development			0.000			0.000		0.000						
Remarks:														
Development Support			0.000			0.000		0.000						
Software Development			0.000			0.000		0.000						
Training Development			0.000			0.000		0.000						
Integrated Logistics Support			0.000			0.000		0.000						
Configuration Management			0.000			0.000		0.000						
Technical Data			0.000			0.000		0.000						
GFE			0.000			0.000		0.000						
Award Fees			0.000			0.000		0.000						
Subtotal Support Costs			0.000			0.000		0.000						
Remarks:														
Developmental Test & Evaluation	WR	NEDU	8.053			2.064	OCT-08	2.090	OCT-09					
Developmental Test & Evaluation	WR	NRC	0.927			1.000	OCT-08	1.000	OCT-09					
Operational Test & Evaluation			0.000			0.000		0.000						
Live Fire Test & Evaluation			0.000			0.000		0.000						

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EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE May 2009		
APPROPRIATION/BUDGET ACTIVITY RDTEN/BA 4		PROGRAM ELEMENT NUMBER AND NAME 0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPMENT					PROJECT NUMBER AND NAME 0099/Deep Submergence Bio Med Dev					
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date		Total Cost (\$000)	Target Value of Contract
Test Assets			0.000			0.000		0.000				
Tooling			0.000			0.000		0.000				
GFE			0.000			0.000		0.000				
Award Fee			0.000			0.000		0.000				
Subtotal Test and Evaluation			8.980			3.064		3.090				
Remarks:												
Contractor Engineering Support			0.000			0.000		0.000				
Government Engineering Support			0.000			0.000		0.000				
Program Management Support	Various	Various	0.000			0.000		0.000				
Travel			0.058			0.035	TBD	0.045	TBD			
Labor (Research Personnel)			0.000			0.000		0.000				
*SBIR Assessment	Various	Various	0.182			0.178	TBD	0.178	TBD			
Subtotal Management Services			0.240			0.213		0.223				
Remarks:*SBIR Assessment includes other extramural program assessments.												
Total Cost			9.220			3.277		3.313				

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION					DATE May 2009		
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 2008	FY 2009	FY 2010				
Project Cost	5.517	4.439	14.015				
RDT&E Articles Qty	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.</p> <p>(SRDRS) to provide a new rapidly deployed emergency submarine rescue capability. SRDRS fills the gap created by the decommissioned 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 and Mother Submarines. 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 - 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, diver thermal protection, and diver sound protection.</p>							

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EXHIBIT R-2a, RDT&E PROJECT JUSTIFICATION			DATE May 2009
APPROPRIATION/BUDGET ACTIVITY RD TEN/BA 4	PROGRAM ELEMENT NUMBER AND NAME 0603713N/OCEAN ENGINEERING TECHNOLOGY DEVELOPM	PROJECT NUMBER AND NAME 0394/Shallow Depth Diving EQ	
B. ACCOMPLISHMENTS/PLANNED PROGRAM:			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	4.304	3.155	12.782
RDT&E Articles Quantity	0	0	0
Continue design, fabrication and acceptance testing of the prototype Submarine Decompression System and support equipment. Continue integration of all SRDRS components.			
	FY 2008	FY 2009	FY 2010
Accomplishments/Effort/Subtotal Cost	1.213	1.284	1.233
RDT&E Articles Quantity	0	0	0
Continue research on contaminated water diving and begin research on diver thermal protection and diver sound protection.			
C. OTHER PROGRAM FUNDING SUMMARY:			
Not Applicable			
D. ACQUISITION STRATEGY:			
<p>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).</p>			
E. MAJOR PERFORMERS:			
<p>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.</p>			

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EXHIBIT R-3, RDT&E PROJECT COST ANALYSIS										DATE		
										May 2009		
APPROPRIATION/BUDGET ACTIVITY		PROGRAM ELEMENT NUMBER AND NAME					PROJECT NUMBER AND NAME					
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 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date		Total Cost (\$000)	Target Value of Contract
Primary Hardware Development			0.000			0.000		0.000				
Ancillary Hardware Development			0.000			0.000		0.000				
Design, System Integration			0.000			0.000		0.000				
Decompression Chambers (SDC1 and 2)			0.000			0.000		0.000				
Various Mission Support Equipment (MSE)			0.000			0.000		0.000				
Pressurized Rescue Module System (PRMS)	CPIF	Oceanworks	23.824			0.000		0.000				
PRMS	FFP	Oceanworks	4.150			0.000		0.000				
Various PRMS MSE			0.000			0.000		0.000				
Systems Engineering - Design, Integration	Various	Oceaneering	3.428			2.504	OCT-08	10.951	OCT-09			
Systems Engineering - Technical	Various	Various	0.537			0.000		0.000				
Licenses			0.000			0.000		0.000				
GFE			0.000			0.000		0.000				
Award Fees			0.000			0.000		0.000				
			0.000			0.000		0.000				
Subtotal Product Development			31.939			2.504		10.951				
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 were originally under a FFP contract through NFESC with a Contract completion date (CCD) of 31 August 2003 which was missed. A settlement agreement was reached and the incomplete chambers were shipped to Oceaneering for completion.												
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	1.213			1.284	NOV-08	1.233	NOV-09			
Software Development			0.000			0.000		0.000				
Integrated Logistics Support			0.000			0.000		0.000				
Integrated Logistics Support	Various	Miscellaneous	0.841			0.000		0.000				

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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						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY Cost (\$000)			FY 2009 Cost (\$000)	FY 2009 Award Date	FY 2010 Cost (\$000)	FY 2010 Award Date		Total Cost (\$000)	Target Value of Contract
Configuration Management	CPAF	Oceaneering	0.489			0.000		0.000				
Technical Data			0.000			0.000		0.000				
GFE			0.000			0.000		0.000				
Award Fees			0.000			0.000		0.000				
Subtotal Support Costs			2.543			1.284		1.233				
Remarks:												
Developmental Test & Evaluation	Various	Miscellaneous	3.187			0.000		0.000				
Operational Test & Evaluation	WR	COMOPTVFOR	0.400			0.050	NOV-08	0.075	NOV-09			
Subtotal Test and Evaluation			3.587			0.050		0.075				
Remarks:												
Contractor Engineering Support	Various	QBS/Various	0.074			0.000		0.000				
Government Engineering Support	WR	NFESC	0.197			0.000		0.000				
Government Engineering Support	MIPR	DOI	0.000			0.000		0.000				
Government Engineering Support	WR	PSNSY, Various	1.940			0.180	NOV-08	0.036	NOV-09			
Government Engineering Support	Various	Miscellaneous	1.686			0.000		0.086	NOV-09			
Program Management Support	Various	Miscellaneous	0.706			0.381	NOV-08	1.559	NOV-09			
Travel	Various	Various	0.289			0.040	TBD	0.075	TBD			
SBIR Assessment			0.443			0.000		0.000				
Subtotal Management Services			5.335			0.601		1.756				
Remarks:												
Total Cost			43.404			4.439		14.015				

CLASSIFICATION:		UNCLASSIFIED						
EXHIBIT R-4a, SCHEDULE DETAIL							DATE May 2009	
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 2008	FY 2009	FY 2010				
SDC 1 & 2 Repairs & Mods		2Q-4Q	1Q-4Q	1Q				
PFMs 1,2,&3 (SRR & PDR Presented)		1Q-4Q	1Q-4Q	1Q-4Q				
PFM PDR		2Q						
PFM CDR			4Q					
DTL (CDR Presented)			2Q-4Q	1Q-4Q				
SDS Gas Rack (CDR Presented)			2Q-4Q	1Q-3Q				
MBS 2000 Base Unit Upgrades		1Q-4Q	1Q-4Q					
SDS Deck Interconnects (54)			1Q-4Q	1Q-2Q				
SDS Templates (SDS SITS)				1Q-4Q				
MTL 1 & 2 Mods & Base SITS				2Q-4Q				
MTL 1 & 2 Mods & Base SITS CDR				4Q				
Rescue Ready		4Q						
SDS Elements				1Q-4Q				
MBS 2000				1Q				
SDC 1 & 2				2Q				
Gas Rack				4Q				