

UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification						DATE: February 2002																											
APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE																													
RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY/BA-4				Ocean Engineering Technology Development 0603713N																													
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	14.591	15.935	15.257	14.582	14.852	8.604	6.729	CONT.	CONT.																								
Deep Submergence Biomedical Development/S0099	3.552	3.690	3.851	3.937	4.009	4.089	4.172	CONT.	CONT.																								
Shallow Depth Diving Equipment/S0394	11.039	12.245	11.406	10.645	10.843	4.515	2.557	CONT.	CONT.																								
Quantity of RDT&E Articles								CONT.	CONT.																								
<p>A. Mission Description and Budget Item Justification: 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, and tools to permit manned underwater operations.</p> <p>B. Program Change Summary:</p> <table style="width: 100%; margin-left: 40px;"> <thead> <tr> <th></th> <th style="text-align: right;">FY 2001</th> <th style="text-align: right;">FY 2002</th> <th style="text-align: right;">FY 2003</th> </tr> </thead> <tbody> <tr> <td>FY 2002 President's Budget:</td> <td style="text-align: right;">15.371</td> <td style="text-align: right;">16.077</td> <td></td> </tr> <tr> <td>Appropriated Value:</td> <td style="text-align: right;">15.371</td> <td style="text-align: right;">16.077</td> <td></td> </tr> <tr> <td>Adjustments to FY 2001/2002 Appropriated Value/FY 2002</td> <td></td> <td></td> <td></td> </tr> <tr> <td>President's Budget Submit:</td> <td style="text-align: right;">-0.780</td> <td style="text-align: right;">-0.142</td> <td></td> </tr> <tr> <td>FY 2003 President's Budget Submit:</td> <td style="text-align: right;">14.591</td> <td style="text-align: right;">15.935</td> <td style="text-align: right;">15.257</td> </tr> </tbody> </table> <p>Funding: FY01 change due to (-0.108) 7% Pro-Rata, (-0.033) Gov't.-Wide Rescission, (-0.301) FY01 SBIR Apr-27-01, (-0.300) June 01 BTRs, and (-0.038) 01 Actuals (30 Sept.01). FY 02 change due to (-0.142) Management Reform Initiative.</p> <p>Schedule: Not applicable.</p> <p>Technical: Not applicable.</p>											FY 2001	FY 2002	FY 2003	FY 2002 President's Budget:	15.371	16.077		Appropriated Value:	15.371	16.077		Adjustments to FY 2001/2002 Appropriated Value/FY 2002				President's Budget Submit:	-0.780	-0.142		FY 2003 President's Budget Submit:	14.591	15.935	15.257
	FY 2001	FY 2002	FY 2003																														
FY 2002 President's Budget:	15.371	16.077																															
Appropriated Value:	15.371	16.077																															
Adjustments to FY 2001/2002 Appropriated Value/FY 2002																																	
President's Budget Submit:	-0.780	-0.142																															
FY 2003 President's Budget Submit:	14.591	15.935	15.257																														

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2002				
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-4		PROGRAM ELEMENT NAME AND NUMBER Ocean Engineering Development 0603713N			PROJECT NAME AND NUMBER Deep Submergence Biomedical Development/S0099					
COST (\$ in Millions)		FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost		3.552	3.690	3.851	3.937	4.009	4.089	4.172	CONT.	CONT.
RDT&E Articles Qty										
<p>A. Mission Description and Budget Item Justification: 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> <p>Program Accomplishments and Plans:</p> <p>FY 2001 Accomplishments:</p> <ul style="list-style-type: none"> - (\$ 1.742) Diver Health and Safety Research: Completed integration of USN decompression tables across pressures, gas mixes, and repetitions. Completed comparative study of swimfins and bouyancy compensators. Completed pilot study of melatonin for decreasing oxygen toxicity. Assessed efficacy of prototype underwater hearing protection strategies. Delivered guidance for acceptable UBA respiratory loads in combination. Continued development of new diver thermal protective garments with industry, and began prototype evaluations. Began study of respiratory muscle training in EOD divers. Developed method of scaling animal decompression studies to humans. Delivered guidance for warm water diving. Initiated profile recording of operational dives. Completed development of a computerized neuropsychological test battery. Determined that the effects of carbon dioxide and oxygen on cerebral blood flow are independent, using cerebral perfusion scanning. - (\$1.810) Submarine Rescue: Developed risk curves for escapers and rescuees from pressurized DISSUB. Developed accelerated oxygen decompression schedules for rescuing DISSUB survivors. Provided a Computerized Submarine Escape and Rescue Expert System (SEAREX) for SSBN 726 class. Developed SRDRS biomedical acceptance criteria. Developed Submarine Escape Action Limits (SEALs) for gas contaminants (under review now by National Academy of Sciences.) 										

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2002
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-4	PROGRAM ELEMENT NAME AND NUMBER Ocean Engineering Development 0603713N	PROJECT NAME AND NUMBER Deep Submergence Biomedical Development/S0099

FY 2002 Plan:

- (\$2.090) Diver Health and Safety Research: Pulmonary oxygen toxicity risk algorithm. 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. Investigate supercritical air for diver cooling. Submarine ballast tank air quality survey.
- (\$1.600) 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.

FY 2003 Plan:

- (\$2.451) Diver Health and Safety Research: 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.
- (\$1.400) Submarine Rescue: 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. Improved CO2 scrubber for DISSUB.

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification		DATE:
APPROPRIATION/BUDGET ACTIVITY RDT&E, N/BA-4	PROGRAM ELEMENT NAME AND NUMBER Ocean Engineering Development 0603713N	February 2002
PROJECT NAME AND NUMBER Deep Submergence Biomedical Development/S0099		
<p>B. Other Program Funding Summary: Not applicable.</p> <p>Related RDT&E: Not Applicable.</p> <p>C. 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.</p> <p>D. Schedule Profile: Not applicable</p>		

R-1 SHOPPING LIST - Item No. 72-4 of 72-11

Exhibit R-2a, RDT&E Project Justification
(Exhibit R-2a, page 4 of 11)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 1)										DATE: February 2002		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT				PROJECT NAME AND NUMBER					
RDT&E, NBA-4			Ocean Engineering Development 0603713N				Deep Submergence Biomedical Developmental/S0099					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 00 Cost	FY 00 Award Date	FY 01 Cost	FY 01 Award Date	FY 02 Cost	FY 02 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Primary Hardware Development											0.000	
Ancillary Hardware Development											0.000	
Systems Engineering											0.000	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees											0.000	
Subtotal Product Development			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks: Not Applicable.												
Development Support Equipment											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	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	
Remarks: Not Applicable.												

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 2)										DATE: February 2002		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT				PROJECT NAME AND NUMBER					
RDT&E, N/BA - 4			Ocean Engineering Development 0603713N				Deep Submergence Biomedical Development/S0099					
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 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
Developmental Test & Evaluation	WR	NEDU	11.264	3.552		3.568		3.724		CONT.	CONT.	
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			11.264	3.552		3.568		3.724		CONT.	CONT.	
Remarks:												
Contractor Engineering Support												
Government Engineering Support												
Program Management Support	IPA					0.102		0.105				
Travel						0.020		0.022				
Labor (Research Personnel)												
Overhead												
Subtotal Management			0.000	0.000		0.122		0.127		CONT.	CONT.	
Remarks:												
Total Cost			11.264*	3.552		3.690		3.851		CONT.	CONT.	
Remarks: * Prior to FY98, funds were in Project M0099.												

R-1 SHOPPING LIST - Item No. 72-6 of 72-11

Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 6 of 11)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification						DATE: February 2002				
APPROPRIATION/BUDGET ACTIVITY RDT&E,N/BA-4		PROGRAM ELEMENT NAME AND NUMBER Ocean Engineering Development 0603713N			PROJECT NAME AND NUMBER Shallow Depth Diving Equipment/S0394					
COST (\$ in Millions)		FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	Cost to Complete	Total Cost
Project Cost		11.039	12.245	11.406	10.645	10.843	4.515	2.557	CONT.	CONT.
RDT&E Articles Qty										

A. Mission Description and Budget Item Justification: 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 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.

Program Accomplishments and Plans:

FY 2001 Accomplishments:

- (\$11.039) Submarine Rescue Diving and Recompression System: Continued fabrication and acceptance testing of the prototype Submarine Decompression System and support equipment. Continued design and fabrication of prototype Pressurized Rescue Module and support equipment.

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification		DATE:
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NAME AND NUMBER	PROJECT NAME AND NUMBER
RDT&E, N/BA-4	Ocean Engineering Development 0603713N	Shallow Depth Diving Equipment/S0394
<p>FY 2002 Plan:</p> <p>- (\$12.245) Submarine Rescue Diving and Recompression System: Complete fabrication and acceptance testing of the prototype Submarine Decompression System and support equipment. Continue design and fabrication of prototype Pressurized Rescue Module and support equipment.</p> <p>FY 2003 Plan:</p> <p>- (\$11.406) Submarine Rescue Diving and Recompression System: Complete design and fabrication of prototype Pressurized Rescue Module and support equipment. Begin acceptance testing of prototype Pressurized Rescue Module and support equipment fabrication of 2nd Pressurized Rescue Module vehicle.</p> <p>B. Other Program Funding Summary: Not applicable.</p> <p>Related RDT&E: Not Applicable.</p> <p>C. Acquisition Strategy: The Atmospheric Diving Suit (ADS) Segment of the SRDRS is a Non-Developmental Item (NDI) which is procured via a sole source contract. 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. The SRS contracts will be awarded competitively and will be based on technical capability and cost considerations (best value). Program Management of SRDRS is accomplished through the use of SEA 00C leadership of an Integrated Product Team (IPT). 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>		

R-1 SHOPPING LIST - Item No. 72-8 of 72-11

Exhibit R-2a, RDT&E Project Justification
(Exhibit R-2, page 8 of 11)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

EXHIBIT R-2a, RDT&E Project Justification

DATE:

February 2002

APPROPRIATION/BUDGET ACTIVITY

RDT&E, N/BA-4

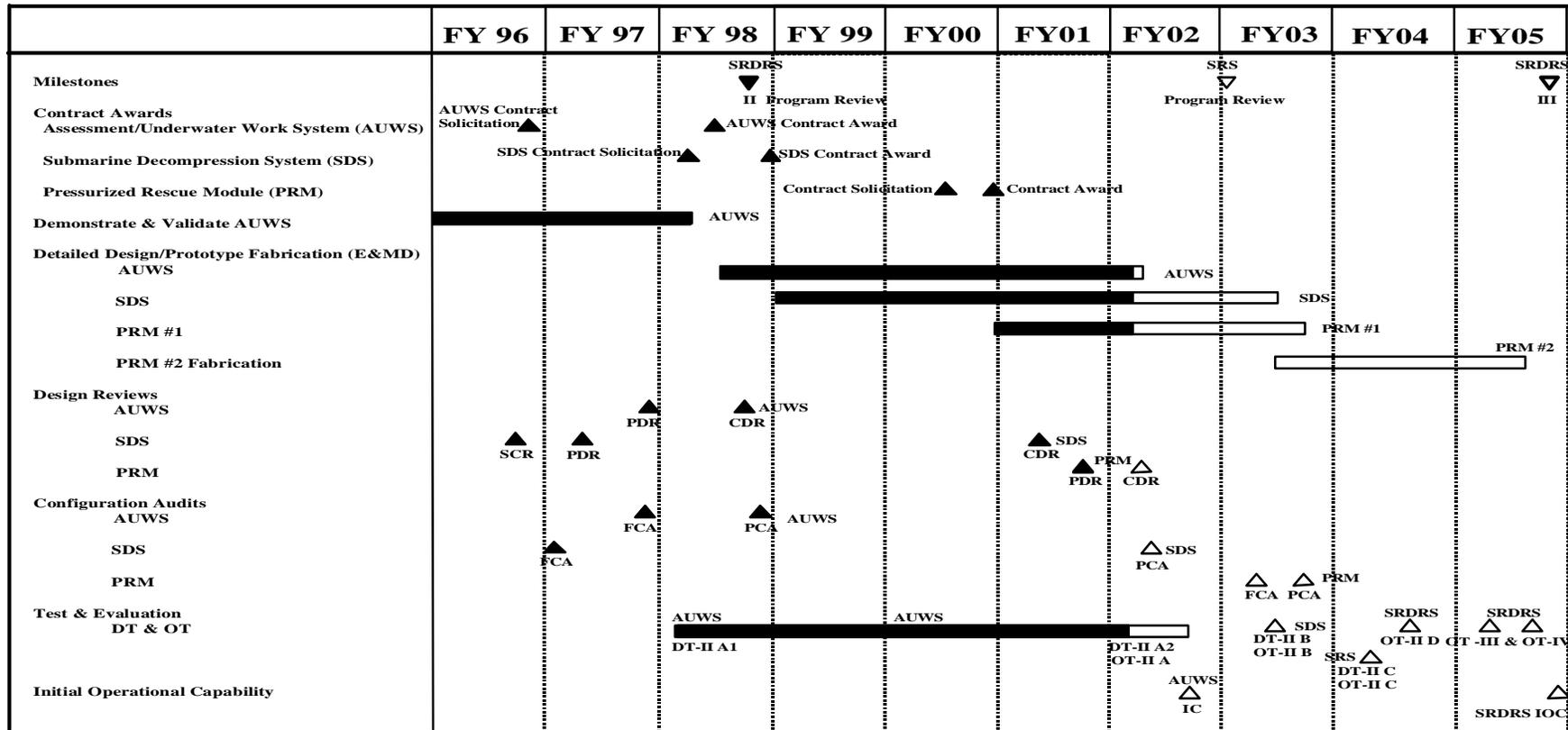
PROGRAM ELEMENT NAME AND NUMBER

Ocean Engineering Development 0603713N

PROJECT NAME AND NUMBER

Shallow Depth Diving Equipment/S0394

D. Schedule Profile:



R-1 SHOPPING LIST - Item No.

72-9 of 72-11

Exhibit R-2a, RDT&E Project Justification

(Exhibit R-2a, page 9 of 11)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 1)								DATE: February 2002				
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N/BA-4			Ocean Engineering Development 0603713N			Shallow Depth Diving Equipment/S0394						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 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	WR	NSWC - CSS	20.089								20.089	20.089
	CPAF	Oceaneering	9.078								9.078	9.078
	RC	NAVFACCO	3.240								3.240	3.240
	CPAF	GPC	4.480	1.700	12/00	0.534	01/02				6.714	6.714
	CPIF	Hard Suits Inc.	0.688	3.772	01/01	4.008	11/01				8.468	20.244
	Various	Miscellaneous	2.138			2.462		7.106		CONT.	CONT.	
Ancillary Hardware Development											0.000	
Systems Engineering	CPAF	Oceaneering	5.985	2.268	12/00						8.253	8.253
	MIPR	VA		0.913		1.500	01/02					
	Various	Miscellaneous				1.375		2.000		CONT.	CONT.	
Licenses											0.000	
Tooling											0.000	
GFE											0.000	
Award Fees	CPAF	Oceaneering	1.076	0.158	12/00						1.234	
	CPAF	GPC	0.187	0.051	12/00	0.016	01/02				0.254	
											0.000	
Subtotal Product Development			46.961	8.862		9.895		9.106		CONT.	CONT.	
Remarks: Award Fees are 6%.												
Development Support Equipment											0.000	
Software Development	WR	NSWC CD	0.221								0.221	0.221
Training Development											0.000	
Integrated Logistics Support	MIPR	DOI	0.809	0.905	01/01						1.714	1.714
	Various	Miscellaneous				0.850		0.800			1.650	1.650
Configuration Management											0.000	
Technical Data											0.000	
GFE											0.000	
Subtotal Support			1.030	0.905		0.850		0.800		CONT.	CONT.	
Remarks:												

R-1 SHOPPING LIST - Item No. 72-10 of 72-11

Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 10 of 11)

UNCLASSIFIED

CLASSIFICATION:

UNCLASSIFIED

Exhibit R-3 Cost Analysis (page 2)										DATE: February 2002		
APPROPRIATION/BUDGET ACTIVITY			PROGRAM ELEMENT			PROJECT NAME AND NUMBER						
RDT&E, N/BA - 4			Ocean Engineering Development 0603713N			Shallow Depth Diving Equipment/S0394						
Cost Categories (Tailor to WBS, or System/Item Requirements)	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 01 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
Developmental Test & Evaluation	Various	Miscellaneous	0.915	0.168		0.300		0.300		CONT.	CONT.	
Operational Test & Evaluation												
Tooling												
GFE												
Subtotal T&E			0.915	0.168		0.300		0.300		CONT.	CONT.	
Remarks:												
Contractor Engineering Support	Various	Miscellaneous	0.993	0.232		0.250		0.250		CONT.	CONT.	
Government Engineering Support	WR	NFESC	0.316	0.050	02/01						0.366	0.366
	MIPR	DOI	0.638	0.523	01/01						1.161	1.161
	Various	Miscellaneous	0.210	0.137		0.750		0.750		CONT.	CONT.	
Program Management Support	Various	Miscellaneous	0.115	0.092		0.100		0.100		CONT.	CONT.	
Travel			0.235	0.070		0.100		0.100		CONT.	CONT.	
Labor (Research Personnel)			0.453							CONT.	CONT.	
Overhead	Various	Miscellaneous										
Subtotal Management			2.960	1.104		1.200		1.200		CONT.	CONT.	
Remarks:												
Total Cost			51.866	11.039		12.245		11.406		CONT.	CONT.	
Remarks:												

R-1 SHOPPING LIST - Item No. 72-11 of 72-11

Exhibit R-3, Project Cost Analysis
(Exhibit R-3, page 11 of 11)

UNCLASSIFIED