CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification	DATE: February 2003
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-7**	PROJECT NUMBER AND NAME **Technology Applications J2228**

B. (U) Accomplishments/Planned Program

	FY 02	FY 03	FY 04	FY 05
Strategic Propulsion Applications Program (SPAP)	0.0	0.0	8.0	40.0
RDT&E Articles Quantity				

(U) FY 2002 PLAN N/A

(U) FY 2003 PLAN N/A

(U) FY 2004 PLAN
- (U) ($8.0) Initiate SPAP program. Full obligation is projected by the 3rd quarter of the first year.
  FY 2004 efforts include:
  - (U) Initiate and complete Industrial Base Assessment.
  - (U) Identify, evaluate and down select suitable technologies for Boost Rocket motor test.
  - (U) Identify and evaluate suitable technologies for Post Boost propulsion technologies test.
  - (U) Identify and evaluate suitable Ordnance technologies for missile flight function tests.
  - (U) Identify fabrication of Boost Rocket Motor test hardware.

(U) FY 2005 PLAN
- (U) ($40.0) Continue SPAP program. Full obligation is projected by the 3rd quarter of the first year.
  FY 2005 efforts include:
  - (U) Continue down select process of Boost Rocket Motor components by testing and prepare for a Boost Rocket motor test demonstration.
  - (U) Initiate component tests for identified Post Boost Control technologies.
  - (U) Initiate component tests for identified Missile Ordnance technologies.
  - (U) Complete fabrication of Boost Rocket Motor test hardware.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification	DATE: February 2003
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-7**	PROJECT NUMBER AND NAME **Technology Applications J2228**

B. (U) Accomplishments/Planned Program

	FY 02	FY 03	FY 04	FY 05
Radiation Hardened Applications Program (RHAP)	0.0	0.0	20.0	20.0
RDT&E Articles Quantity				

(U) FY 2002 PLAN N/A

(U) FY 2003 PLAN N/A

•

(U) FY 2004 PLAN

- (U) ($20.0) Initiate RHAP program. Full obligation is projected by the 3rd quarter of the first year.
  FY 2004 efforts include:
  - (U) Start productization and qualification of .35 micron digital Silicon-On-Insulator (SOI) technology
  - (U) Start productization and qualification of .7 micron mixed signal SOI technology.
  - (U) Start evaluation of an Electromagnetic Pulse/Electromagnetic Interference (EMP/EMI) cable coupling model.
  - (U) Start evaluation of system circuit models incorporating Built-in Self Test and effects of dose rate, total ionizing dose and single event effects.
  - (U) Start evaluation of post radiation SPICE models for dose rate, total ionizing dose, and single event effects.

U) FY 2005 PLAN

- (U) ($20.0) Continue RHAP program. Full obligation is projected by the 3rd quarter of the first year.
  FY 2005 efforts include:
  - (U) Continue productization and qualification of .35 micron digital SOI technology.
  - (U) Continue productization and qualification of .7 micron mixed signal SOI technology.
  - (U) Continue evaluation of an EMP/EMI cable coupling model.
  - (U) Continue evaluation of system circuit models incorporating Built-in Self Test and effects of dose rate, total ionizing dose and single event effect.
  - (U) Continue evaluation and validation of post radiation SPICE models for dose rate, total ionizing dose, and single event effects.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification	DATE: February 2003
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-7**	PROJECT NUMBER AND NAME **Technology Applications J2228**

C. (U) Other Program Funding Summary: (Dollars in Thousands)

FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Total Complete	Total Cost
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

D. (U) Acquisition Strategy:

Contracts will continue to be awarded to those sources who were engaged in the TRIDENT II (D5) development program and are currently engaged in the production and/or operational support of the deployed D5/C4 Strategic Weapons Systems on the basis of Other Than Full and Open Competition pursuant to the authority of 10 U.S.C. 2304 (c) (1) and (3) implemented by FAR 6.302.-1, 3 4.

E. (U) Major Performers:

- LMMS / CA - Reentry Body Systems integration (RSAP)
- NSWC / VA - Heatshield Nosetip materials development (RSAP)
- ITT / CO - Vulnerability and hardness technologies (RSAP)
- CNSW / IN - Electronics and hardness testing (RSAP)
- CSDL / MA - Reentry Systems flight test instrumentation (RSAP)
- CSDL / MA - Guidance Application program support (GAP)
- DOE / NM - Advanced fuzing technology (RSAP)
- LMMS/CA- Missile radiation hardened electronics integration (RHAP)
- CSDL/MA- Guidance radiation hardened electronics integration(RHAP)
- LMMS/CA - Missile systems integration (SPAP)
- NAWC - Rocket motor testing & integration(SPAP)

CLASSIFICATION:

Exhibit R-3 Cost Analysis		DATE: February 2003
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT **PE 0101221N Strategic Sub & Wpns Sys Spt**	PROJECT NUMBER AND NAME **Technology Applications J2228**

Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
Support & Management												
Technology Applications	SS - CPFF	LMMS / CA	49.0	8.9	10-02	13.9	10-03	13.5	10-04	Cont.	Cont.	TBD
Technology Applications	WR	NSWC / CA	35.8	4.7	10-02	10.0	10-03	9.2	10-04	Cont.	Cont.	TBD
Technology Applications	MIPR	DOE / NM	12.6	4.5	10-02	0.9	10-03	2.1	10-04	Cont.	Cont.	TBD
Technology Applications	SS - CPFF	CSDL / MA	5.5	0.1	10-02	1.2	10-03	1.2	10-04	Cont.	Cont.	TBD
Technology Applications	SS - CPFF	KAMAN / CO	4.5	0.0	10-02	0.0	10-03	0.0	10-04	Cont.	Cont.	TBD
Technology Applications	SS - CPFF	ITT / CO	N/A	1.0	10-02	1.4	10-03	1.1	10-04	Cont.	Cont.	TBD
Technology Applications	SS - CPFF	CSDL / MA	106.1	14.7	10-02	16.8	10-03	19.5	10-04	Cont.	Cont.	TBD
Technology Applications	SS - CPFF	CNSW / IN	0.1	0.1	10-02	0.1	10-03	0.1	10-04	Cont.	Cont.	TBD
Technology Applications	SS - CPFF	LMMS / CA	N/A			3.4	10-03	3.4	10-04	Cont.	Cont.	TBD
Technology Applications	SS - CPFF	CSDL / MA	N/A			16.4	10-03	16.6	10-04	Cont.	Cont.	TBD
Technology Applications	SS - CPFF	LMMS/CA	N/A			6.8	10-03	34.2	10-04	Cont.	Cont.	TBD
Technology Applications	WR	NAWC/CA	N/A			0.9	10-03	3.0	10-04	Cont.	Cont.	TBD
	VARIOUS	VARIOUS	N/A			0.4	10-03	2.8	10-04	Cont.	Cont.	TBD
Subtotal Product Development			213.6	34.0		72.2		106.7		Cont.	Cont.	TBD
Remarks:												
Total Cost			213.6	34.0		72.2		106.7		Cont.	Cont.	
Remarks:												

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification						DATE: **February 2003**		
APPROPRIATION/BUDGET ACTIVITY **RESEARCH DEVELOPMENT TEST & EVALUATION, NAVY / BA-7**					R-1 ITEM NOMENCLATURE **PE 0101221N Strategic Sub & Wpns Sys Spt**			
COST ($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Total PE Cost	**0.547**	**5.269**	**3.012**	**2.560**	**3.471**	**3.356**	**3.440**	**3.526**

Defense Emergency Response Funds (DERF) : Not Applicable.

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The TRIDENT operational systems development program results in improvements to the baseline TRIDENT Combat System. Current TRIDENT Combat Systems were first developed in the early 1970s and are becoming increasingly difficult to maintain and offer comparitively less performance than more recently designed systems. Previous efforts to upgrade portions of the TRIDENT Combat System include improvements via sonar and combat control hardware and software (e.g., QE2 programs), feasibility of increased countermeasure capability and a concept evaluation of an Submarine Fleet Mission Program Library (SFMPL) interface. Due to the sensitivity of TRIDENT programs it is assessed that international technology will not have a major impact or be a recipient of the benefits derived from this effort. Development strategies will significantly enhance the sustainability and operability of the sonar, communications and Combat Control Systems on TRIDENTs by evaluating both Obsolete Equipment Replacement (OER) possibilities and potential improvements.

R-1 SHOPPING LIST - Item No. 165

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification							DATE: February 2003	
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA7**	PROGRAM ELEMENT NUMBER AND NAME **PE 0101221N Strategic Sub & Wpns Sys Spt**				PROJECT NUMBER AND NAME **S0004**			
COST ($ in Millions)	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
Project Cost	**0.547**	**5.269**	**3.012**	**2.560**	**3.471**	**3.356**	**3.440**	**3.526**
RDT&E Articles Qty								

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The TRIDENT operational systems development program results in improvements to the baseline TRIDENT Combat System. Current TRIDENT Combat Systems were first developed in the early 1970s and are becoming increasingly difficult to maintain and offer comparitively less performance than more recently designed systems. Previous efforts to upgrade portions of the TRIDENT Combat System include improvements via sonar and combat control hardware and software (e.g., QE2 programs), feasibility of increased countermeasure capability and a concept evaluation of an Submarine Fleet Mission Program Library (SFMPL) interface. Due to the sensitivity of TRIDENT programs it is assessed that international technology will not have a major impact or be a recipient of the benefits derived from this effort. Development strategies will significantly enhance the sustainability and operability of the sonar, communications and Combat Control Systems on TRIDENTs by evaluating both Obsolete Equipment Replacement (OER) possibilities and potential improvements.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2003
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	**PE 0101221N Strategic Sub & Wpns Sys Spt**	**S0004**

B. Accomplishments/Planned Program

	FY 02	FY 03	FY 04	FY 05
Valve Regulated Lead Acid (VRLA) Batteries		4.000	2.500	
RDT&E Articles Quantity				

Valve Regulated Lead Acid (VRLA) Batteries are sealed state-of-the-art technology that significantly reduces the maintenance involved with traditional flooded lead acid submarine batteries. VRLA eliminates the need for air agitation systems, battery make-up water additions, flash arrestors and charcoal filters. VRLA enables convenience charging, requires no special ventilation lineups, requires fewer environmental concerns and offers increased life up to 8 years. Most importantly, VRLA batteries also have many workload (quality of life) and cost reduction benefits. FY03-FY04 funds will be used to perform the initial VRLA cell design, battery well assessment studies, install and operate prototype battery cells, and develop ship alteration packages for all classes.

	FY 02	FY 03	FY 04	FY 05
Ship Control Station Obsolete Equipment Upgrade			0.325	2.020
RDT&E Articles Quantity				

In order to support the expected 42-year operational cycle for a TRIDENT submarine a Ship Control Station (SCS) and Obsolete Equipment Replacement programs needs to be instituted. The OER program will attempt to utilize the design changes that are being developed for the VIRGINIA Class SCS Hull, Mechanical and Electrical (HM&E) interfaces. The replacement SCS will utilize commercial off the shelf components and will replace existing hardware wired displays and indications with flat panel displays and indications.

	FY 02	FY 03	FY 04	FY 05
Architecture Model Maintenance & COTS	0.547	0.480	0.187	0.540
RDT&E Articles Quantity				

Conduct COTS/emergent technology and CCS performance requirements evaluations supporting Trident modernization program/plans. Research and evaluate effectiveness of proposed new technology over the ships' life cycle. Analyze impacts on platform performance with proposed new technology changes using architecture models and tests. Study and identify options in selecting and installing new technology improvements. Evaluate Navigation data interface requirements to meet ECDIS-N compliance on Trident hulls. Complete CCC CONOPS study to accommodate Revision 7.3 (MK2 ECP4) installation. Provide arrangement layouts GFI to Electric Boat (EB) Ship Design Agent (SDA).

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: **February 2003**
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	**PE 0101221N Strategic Sub & Wpns Sys Spt**	**S0004**

B. Accomplishments/Planned Program (Cont.)

	FY 02	FY 03	FY 04	FY 05
Data Processing System Development		0.789		
RDT&E Articles Quantity				

To evaulate potential areas of renovation and to identify a phased approach that facilitiates the replacement of the TRIDENT CCS/DPS legacy subsystems:

Continue analysis of the physical requirements and characteristics of OER items, including the satisfaction of redundancy, survivability and maintainability requirements. Analyze and recommend applicable COTS hardware and software items, and the identification of any developmental items required for the development of the final product. Identify design options for centralized CCS anomaly, fault and failure data gathering and analysis. Identify DPS Workstation to meet high availability requirements levied by the processing of mission critical data as well as total CCS statusing and alarming in a networked environment, including the provision for a remote workstation display capability in critical spaces to provide complete CCS status monitoring and fault isolation capabilities. Prototype development is also included. Analyze networked architectures embraced by non-TRIDENT platforms for applicability. Analyze design component capture potential from the Submarine Warfare System Design and maximize commonality with proposed SSGN architecture.

Conduct system engineering working group meetings to facilitate a plan to migrate away from the DPS AN/UYK-43 computer. Analyze existing legacy AN/UYK-43 subsystem requirements and determine applicability to future CCS design with Revision 9.0 as the target revision. Identify CCS legacy functionality that may be accommodated by the DPS Workstatioin design. Analyze signals processing currently performed by the DPS (TSDC) for the Ship Control Subsystem (SCS) and for reassignment to the SCS.

DPS Rev 7.3 Modifications In Support of MK2 ECP-004 NAV Interface:

In lieu of TIDS availability, modifications are necessary to the DPS to provide RLGN-like services for SSBN platforms by implementing a Network Data Processor/Server/Client capability at the DPS Mission Critical Workstation (MCW) to satisfy MK2 and ARCI needs for CCS Revision 7.3. DPS modifications in support of this capability include the serving of Nav Data to TIDS or directly to MK2/ARCI via VA Class IDL using CORBA interfaces and NTP data received from the UYK-43 to MK2/ARCI, also via VA Class IDL. Processing will also be implemented for the DPS MCW to receive health status information from MK2/ARCI for both internal DPS MCW interface statusing as well as to satisfy UYK-43 legacy subsystem user requirements. DPS AOBT processing will also be modified to accept data from ARCI via a TBD CORBA structure.

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2003
APPROPRIATION/BUDGET ACTIVITY	PROGRAM ELEMENT NUMBER AND NAME	PROJECT NUMBER AND NAME
RDT&E, N / BA-7	**PE 0101221N Strategic Sub & Wpns Sys Spt**	**S0004**

C. PROGRAM CHANGE SUMMARY:

Funding:	FY 2002	FY 2003	FY 2004	FY 2005
Previous President's Budget: (FY 03 Pres Controls)	0.561	5.399	4.412	4.312
Current BES/President's Budget (FY04 Presidents Controls)	0.547	5.269	3.012	2.560
Total Adjustments	-0.014	-0.130	-1.400	-1.752
Summary of Adjustments				
Congressional undistributed reductions	-0.003	-0.062	-0.781	-0.450
Reprogrammings			-0.500	-1.200
FY02 Actuals	-0.011			
PBD203			-0.052	-0.052
PBD604			-0.068	-0.055
Inflation Savings		-0.068		
NWCF Rates Adjustments			0.001	0.005
Subtotal	-0.014	-0.130	-1.400	-1.752

Schedule:

VRLA BATTERY - FY03 (1st Qtr) – Program Inception; Cell Design and Development
FY04 (4th Qtr) - Cell Qualification Testing
FY05 (2nd QTR) - Certification / IOC

Technical:

Not Applicable

R-1 SHOPPING LIST - Item No. 165

CLASSIFICATION:

EXHIBIT R-2a, RDT&E Project Justification		DATE: February 2003
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**	PROGRAM ELEMENT NUMBER AND NAME **PE 0101221N Strategic Sub & Wpns Sys Spt**	PROJECT NUMBER AND NAME **S0004**

D. OTHER PROGRAM FUNDING SUMMARY:

Line Item No. & Name	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	To Complete	Total Cost
267600 / 267606 BA2 OPN (Electronics)	11117	20905	8560	5297	3428	4034	4099	4170	0	61610
095000 BA1 (HM&E)	21018	38662	26660	63469	119774	126096	135260	139977	0	670916
094500 / 094505 BA1 (Batteries)	10657	13703	11471	26449	24080	30645	13721	114375	0	245101

E. ACQUISITION STRATEGY: *

VRLA Battery - The Type Commanders (TYCOMs) establish battery replacement schedules based on battery performance and maintenance availability. Beginning in FY04, NAVSEA intends to shift procurement from flooded batteries to VRLA. In FY05, the only replacement batteries available will be VRLA; thus the SHIPALT must be accomplished to support installations beginning in FY05.

Ship Control Station - The proposed architecture will consist of the following hardware components. Ship Control Panel (SCP), Ballast Control Panel (BCP), Remote Interface Controller (RIC), Remote Interface Box (RIB). The SCP will be modified be removing the existing panels and replacing them with the flat panel display that provide the operator controls and indications needed to control all plane surfaces. The existing emergency hydraulic control will be maintained.

F. MAJOR PERFORMERS: **

VRLA Batteries
NSWC Crane, Indiana: Development engineering and test support.
GNB, Fort Smith, Arkansas: Battery cell design/development.
General Dynamics Electric Boat, Groton, Connecticut: Ship alteration package design/development.
Northrop Grumman Newport News, Newport News, VA: Ship alteration package design/development.

Ship Control Station - NSWC CARDEROCK

*** Not required for Budget Activities 1,2,3, and 6**
**** Required for DON and OSD submit only.**

R-1 SHOPPING LIST - Item No. 165

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 1)										DATE: February 2003		
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT **PE 0101221N Strategic Sub & Wpns Sys Spt**			PROJECT NUMBER AND NAME **S0004**						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
											0.000	
Project Unit A											0.000	
Design/Development Engineering	SS/CPFF	Electric Boat, Groton, CT		1.300	01/03	0.569	01/04	0.000	N/A	0.000	1.869	1.957
Design/Development Engineering	SS/CPFF	NG NNEWS, VA		1.270	01/03	0.500	01/04	0.000	N/A	0.000	1.770	1.242
Developmental Test & Evaluation	SS/WR	NSWC CRANE, IN		1.430	01/03	1.431	01/04			0.000	2.861	3.301
											0.000	
Project Unit B											0.000	
Design/Development Engineering	SS/WR	NSWC Carderock, MD				0.325	01/04	2.020	01/05	2.875	5.220	5.220
											0.000	
											0.000	
											0.000	
Subtotal Product Development				4.000		2.825		2.020		2.875	11.720	

Remarks: NSWC Crane - Funds will be used to perform the initial VRLA cell design, battery well assessment studies and develop the prototype battery.

											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal Support			0.000	0.000		0.000		0.000		0.000	0.000	

Remarks:

CLASSIFICATION:

Exhibit R-3 Cost Analysis (page 2)								DATE: **February 2003**				
APPROPRIATION/BUDGET ACTIVITY **RDT&E, N / BA-7**			PROGRAM ELEMENT **PE 0101221N Strategic Sub & Wpns Sys Spt**			PROJECT NUMBER AND NAME **S0004**						
Cost Categories	Contract Method & Type	Performing Activity & Location	Total PY s Cost	FY 03 Cost	FY 03 Award Date	FY 04 Cost	FY 04 Award Date	FY 05 Cost	FY 05 Award Date	Cost to Complete	Total Cost	Target Value of Contract
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
											0.000	
Subtotal T&E			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 Management			0.000	0.000		0.000		0.000		0.000	0.000	
Total Cost			0.000	4.000		2.825		2.020		2.875	11.720	

Remarks:

R-1 SHOPPING LIST - Item No. 165