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| Exhibit R-2, RDT&E Budget Item Justification | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | R-1 Item Nomenclature SUBMARINE SYSTEM EQUIPMENT DEVELOPMENT/0604503N |

| COST (\$ in Millions) | FY 1998 | FY 1999 | FY 2000 | FY 2001 | FY 2002 | FY 2003 | FY 2004 | FY 2005 | Cost to Complete | Total Cost |
|--|---------|---------|---------|---------|---------|---------|---------|---------|------------------|------------|
| Total P.E. Cost | 56.0 | 61.9 | 48.9 | 34.9 | 38.7 | 41.5 | 62.7 | 65.8 | CONT. | CONT. |
| F0775/ Submarine Support Equipment | 0 | 2.6 | 1.0 | 1.0 | .7 | .7 | .7 | .7 | CONT. | CONT. |
| F0219/ Submarine Sonar Improvement | 45.3 | 48.9 | 40.0 | 28.0 | 22.5 | 20.4 | 42.1 | 38.1 | CONT. | CONT. |
| X0742/ Submarine Integrated Antenna Systems | 6.0 | 2.9 | 2.0 | 1.0 | 5.9 | 14.9 | 14.6 | 21.6 | CONT. | CONT. |
| X1411/ Submarine Tactical Communications Systems | 4.7 | 7.5 | 5.9 | 5.0 | 9.7 | 5.6 | 5.4 | 5.5 | CONT. | CONT. |
| Quantity of RDT&E Articles | 0 | 0 | 2.5/6.2 | 0 | 0 | 0 | 0 | 0 | | |

A. (U) Mission Description and Budget Item Justification: The Submarine Support Equipment Program develops and improves submarine Electronic Support Measures (ESM) techniques and components, equipment, and systems that will increase submarine operational effectiveness in the increasingly dense and sophisticated electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements are necessary for submarine ESM to be effective in conducting the following mission areas: Joint Littoral Warfare, Joint Surveillance, Space and Electronic Warfare and Intelligence Collection, Maritime Protection, and Joint Strike. The major efforts in this area are the Engineering and Manufacturing Development of the New SSN ESM System (formerly ASTECS), Integrated ESM Mast, ESM On Board Team Trainer, ESM software Program Trouble Report (PTR) evaluation and resolution, and de-installation of the ESM Engineering Developmental Model (EDM) from the DT/OT test platform. The ESM system is also planned for backfit on SSN 688 and SEAWOLF class submarines.

(U) The Submarine Sonar Improvement Program delivers block updates to Sonar Systems installed on SSN 688, 688I, 21 and TRIDENT Class Submarines to maintain clear acoustic, tactical and operational superiority over submarine and surface combatants in all scenarios through detection, classification, localization and contact following. Current developments are focused on supporting Littoral Warfare, Regional Sea Denial, Battle Group Support, Diesel Submarine Detection, Surveillance, and Peacetime Engagement.

(U) The Submarine Integrated Antenna Systems project develops the antennas needed to communicate in networks such as Ultra High Frequency Satellite Communications, Extremely Low Frequency (ELF), Extremely High Frequency (EHF), Super High Frequency and Global Positioning System. Hardware developments include: (a) mast-mounted systems; (b) buoyant cable systems; (c) expendable buoy systems and (d) submarine antenna distribution systems.

(U) The Submarine Tactical Communications Systems project provides attack submarines with an exterior communications system which: (a) minimizes the time required at communications depth; (b) enhances operability, reducing errors and manpower requirements; and (c) provides flexibility for low impact growth and change throughout the life of the submarine. Design efforts will provide increased antenna signal distribution and interconnection subsystems to accommodate ELF, EHF, and Mini-Demand Assigned Multiple Access and a message storage and processing subsystem.

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| Exhibit R-2, RDT&E Budget Item Justification | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | R-1 Item Nomenclature SUBMARINE SYSTEM EQUIPMENT DEVELOPMENT/0604503N |

| | | | |
|--|----------------|----------------|----------------|
| B. (U) Program Change Summary: | | | |
| | <u>FY 1998</u> | <u>FY 1999</u> | <u>FY 2000</u> |
| FY 1999 President's Budget: | 56.0 | 50.3 | 43.3 |
| Appropriated Value: | 57.5 | 62.3 | 0 |
| Adjustment to FY 1998 Appropriated Value/FY 1999 President's Budget: | | | |
| a. Congressional Undistributed Reductions | -1.5 | | |
| b. SBIR Reduction | -1.0 | | |
| c. Towed Arrays and Handlers | | | 4.2 |
| d. Fund BSY-2 OER from R&D vice OPN | | | 3.2 |
| e. minor pricing adjustments | 1.0 | -4 | -4.0 |
| f. precision bottom mapping | | | 2.1 |
| FY 2000/01 PRES Budget Submit: | 56.0 | 61.9 | 48.8 |
| (U) Change Summary Explanation: | | | |
| Funding: See individual program element summaries | | | |
| Schedule: See individual program element summaries | | | |
| Technical: See individual program element summaries | | | |

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N | PROJECT NAME AND NUMBER Submarine Support Equipment Development / F0775 |

| Cost (\$ in Millions) | FY 1998 | FY 1999 | FY 2000 | FY 2001 | FY 2002 | FY 2003 | FY 2004 | FY 2005 | Cost to Complete | Total Cost |
|---------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|------------------|------------|
| Submarine Support Equipment/ F0775 | 0 | 2.6 | 1.0 | 1.0 | .7 | .7 | .7 | .7 | CONT. | CONT. |
| RDT&E Articles Qty | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

A. (U) Mission Description and Budget Item Justification: This program develops and improves techniques and components, equipment, and systems that will increase submarine operational effectiveness in the increasingly dense and sophisticated electromagnetic environment caused by the proliferation of complex radar, communications, and navigation equipment of potential adversaries. Improvements are necessary for Submarine Electronic Support Measures to be effective in conducting the following mission areas: Joint Littoral Warfare; Joint Surveillance, Space and Electronic Warfare and Intelligence Collection; Maritime Protection; and Joint Strike. Specific efforts include development of the: (1) New SSN ESM system, (2) Integrated ESM Mast, (3) ESM On Board Team Trainer, (4) ESM software Problem Trouble Report evaluation and resolution and de-installation of the ESM Engineering Developmental Model from the DT/OT test platform. The ESM system is also planned for backfit on SSN 688 and SEAWOLF class submarines. Two ESM system EDM's were procured in FY95 (included F1950 funding). One EDM will be used for system integration testing and at-sea testing on board an SSN 688 class submarine. The other ESM EDM will be used for shock qualification testing. Two IEM EDMs were procured in FY93 (included F1950 funding) and are provided as GFE to the ESM EDM contract. There are no new test articles being procured during this timeframe. OBTT will be an upgrade to the two ESM EDM's presently under development. An OBTT is being developed for the ESM system presently under development. OBTT is required by the NSSN ORD.

(U) Program Accomplishments and Plan:

1. (U) FY 1998 Accomplishments:

- (U) Project Funded under Program Element 0604558N Project F1950.

2. (U) FY 1999 Plan:

- (U) Install ESM EDM on a SSN 688 test platform. (Effort funded by P.E. 0604558N, Project F1950)
- (U) (\$1.9) Begin engineering development of ESM OBTT.
- (U) (\$.6) Perform ESM software PTR evaluation and resolution.
- (U) (\$.1) Portion of extramural program is reserved for Small Business Innovation Research assessment in accordance with 15 USC 638.

3. (U) FY 2000 Plan:

- (U) (\$.3) Complete ESM OBTT engineering development.
- (U) (\$.7) Continue to perform ESM software PTR evaluation and resolution.

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| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N | PROJECT NAME AND NUMBER Submarine Support Equipment Development / F0775 |

(U) Program Change Summary:

| | <u>FY 1998</u> | <u>FY 1999</u> | <u>FY 2000</u> |
|--|----------------|----------------|----------------|
| FY 1999 President's Budget: | 0 | 2.6 | 1.0 |
| Appropriated Value: | 0 | 2.6 | 0 |
| Adjustment to FY 1998 Appropriated Value/FY 1999 President's Budget: | 0 | 0 | 0 |
| FY 2000/01 PRES Budget Submit: | 0 | 2.6 | 1.0 |

(U) Change Summary Explanation:

Funding: Not Applicable

Schedule: Not Applicable

Technical: Not Applicable

B. (U) Other Program Funding Summary:

| | <u>FY 1998</u> | <u>FY 1999</u> | <u>FY 2000</u> | <u>FY 2001</u> | <u>FY 2002</u> | <u>FY 2003</u> | <u>FY 2004</u> | <u>FY 2005</u> | <u>To Complete</u> | <u>Total Cost</u> |
|--------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------|-------------------|
| OPN Line 256000 | 0 | 0 | 14.1 | 14.8 | 12.8 | 26.4 | 20.6 | 21.0 | 0 | 109.7 |
| PE 0204281N | | | | | | | | | | |
| SSEP ML015 | | | | | | | | | | |
| MLXX1 | 0 | 0 | 0 | 0 | 0 | 6.0 | 0 | 7.0 | 0 | 13.0 |
| MLXX2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10.0 | 0 | 10.0 |
| OPN LI 256005 | 0 | 0 | .03 | .9 | 2.6 | 2.6 | 1.0 | 4.4 | 0 | 11.5 |
| PE 0204281N | | | | | | | | | | |
| SSEP ML51N | | | | | | | | | | |
| O&MN | 0 | 0 | .7 | 2.8 | 2.8 | 2.9 | 2.9 | 3.0 | Cont. | 15.1 |
| PE 0702827N/Subhead 8B2B | | | | | | | | | | |
| SSEP | | | | | | | | | | |
| SCN LI 201300 | 26.5 | 19.2 | 0 | 20.0 | 20.5 | 0 | 22.3 | 22.8 | 668.8 | 800.7 |

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Exhibit R-2a RDT&E Project Justification
(Exhibit R-2a, Page 4 of 26)

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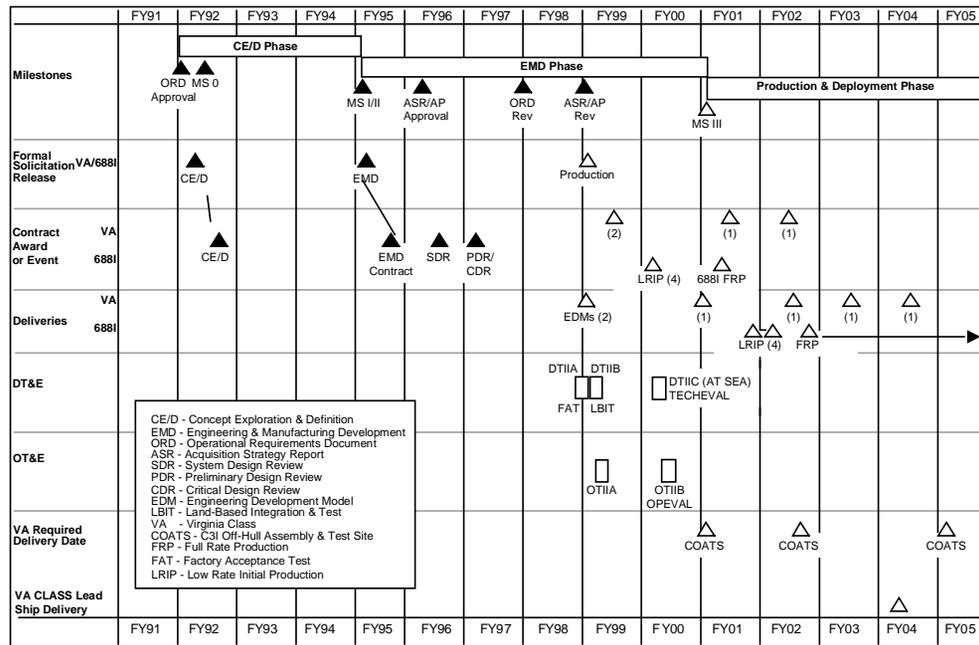
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| Exhibit R-2a, RDT&E Project Justification | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N | PROJECT NAME AND NUMBER Submarine Support Equipment Development / F0775 |

| | | | | | | | | | | |
|--|-----|-----|-----|---|---|---|---|---|---|-----|
| PE 0204287N Partial (ESM Only) | | | | | | | | | | |
| Related RDT&E: | | | | | | | | | | |
| (U) PE 0603562N/Submarine Tactical Warfare System | | | | | | | | | | |
| (U) PE 0604558N/New SSN Combat Systems Development/Project /F1950 | | | | | | | | | | |
| | 2.1 | 2.3 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.9 |
| (U) PE 0604558N/New SSN Combat Systems Development/ Project F2430 | | | | | | | | | | |
| | 7.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7.5 |
| C. (U) Acquisition Strategy: Current efforts in this project consist of P3 improvements to the ESM system which is already under contract. | | | | | | | | | | |
| D. (U) Schedule Profile: ESM Program Schedule attached. | | | | | | | | | | |

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N | PROJECT NAME AND NUMBER Submarine Support Equipment Development / F0775 |

Program Schedule



Version 1.0

Team Submarine

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| Exhibit R-3 Cost Analysis | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N | PROJECT NAME AND NUMBER Submarine Support Equipment Program / F0775 |

| Cost Categories (Tailor to WBS, or System/Item Requirements) | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY99 Cost | FY99 Award Date | FY00 Cost | FY00 Award Date | FY01 Cost | FY01 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|------------------------------|--------------------------------------|----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---------------------|---------------|--------------------------------|
| Primary Hardware Development | | | | | | | | | | | | |
| IEM/HPI Interface | SS/CPIF | SENSYS Tech. Newington, VA | 2.7 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | 2.7 | 2.7 |
| ESM/IEM BDE System EMD | C/FFP | Lockheed Martin Syracuse, NY | 7.5 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | 7.5 | 7.5 |
| ESM OBTT/Software PTR fixes | SS/FFP | Lockheed Martin Syracuse, NY | 0 | 2.6 | 12/98 | 1.0 | 12/99 | 0 | 0 | CONT. | CONT. | TBD |
| Systems Engineering | WR | NUWC Newport, RI | 3.8 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | 3.8 | N/A |
| Miscellaneous | WR/RCP | VARIOUS | 12.4 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | 12.4 | N/A |
| GFE (AN/UYQ-70 Displays) Lockheed Martin Eagan, MN Delivered in FY96 to LMC Syracuse | C/FFP | Lockheed Martin Eagan, MN | .7 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | .7 | N/A |
| IEM ADSU EMD (EDMs) E-Systems Goleta, Ca. EDM#1 delivered to LMC, Syracuse 9/97 EDM#2 to be delivered to LMC Syracuse 4/99 | C/CPIF/ CPAF | E-Systems Goleta, CA | 38.1 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | 38.1 | 38.1 |
| Award Fees | C/CPAF | E-Systems Goleta, CA | .2 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | .2 | .2 |
| Subtotal Product Development | | | 65.4 | 2.6 | | 1.0 | | 0 | | CONT. | CONT. | N/A |

Remarks: Both IEM and GFE EDMs will be used by the ESM EDM prime contractor for systems integration and shock qualification testing. Payment of award fees on the IEM ADSU EMD contract were discontinued due to cost and schedule problems. The contract was subsequently re-structured.

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| Exhibit R-3 Cost Analysis | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N | PROJECT NAME AND NUMBER Submarine Support Equipment Program / F0775 |

| | | | | | | | | | | | | |
|--|------------------------------|--------------------------------------|----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---------------------|---------------|--------------------------------|
| Engineering Technical Services | C/CPIF | GRCI McLean, Va. | 2.7 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | 2.7 | N/A |
| Studies Analysis & Evaluations | C | MITRE, McLean, Va | 1.0 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | 1.0 | N/A |
| GFE | | | | | | | | | | | | |
| Subtotal Support | | | 3.7 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | 3.7 | N/A |
| | | | | | | | | | | | | |
| Cost Categories (Tailor to WBS, or System/Item Requirements) | Contract Method & Type | Performing Activity & Location | Total PYS Cost | FY99 Cost | FY99 Award Date | FY00 Cost | FY00 Award Date | FY01 Cost | FY01 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
| Management Support Services | C/CPIF | GRCI McLean, Va/VITRO | 3.1 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | 3.1 | N/A |
| Subtotal Management | | | 3.1 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | 3.1 | N/A |
| Developmental/Operational Test & Evaluation | N/A | N/A | | 0 | | 0 | | 0 | | 0 | | |
| Subtotal T&E | N/A | N/A | | 0 | | 0 | | 0 | | 0 | | |
| Total Cost | | | 72.2 | 2.6 | | 1.0 | | 0 | | CONT. | CONT. | CONT. |
| | | | | | | | | | | | | |

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Exhibit R-3 Project Cost Analysis
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| Exhibit R-2a, RDT&E Project Justification | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N | PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219 |

| Cost (\$ in Millions) | FY 1998 | FY 1999 | FY 2000 | FY 2001 | FY 2002 | FY 2003 | FY 2004 | FY 2005 | Cost to Complete | Total Cost |
|---------------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|------------------|------------|
| Submarine Sonar Improvement/ F0219 | 45.3 | 48.9 | 40.0 | 28.0 | 22.5 | 20.4 | 42.1 | 38.1 | CONT. | CONT. |
| RDT&E Articles Qty | 0 | 0 | 2.5/6.2 | 0 | 0 | 0 | 0 | 0 | 0 | |

A. (U) Mission Description and Budget Item Justification: This program delivers block updates to Sonar Systems installed on SSN 688, 688I, 21 and TRIDENT Class Submarines to maintain clear acoustical, tactical and operational superiority over submarine and surface combatants in all scenarios through detection, classification, localization and contact following. Current developments, detailed below, are focused on supporting Littoral Warfare, Regional Sea Denial, Battle Group Support, Diesel Submarine Detection, Surveillance, and Peacetime Engagement. The AN/BSY-1 ECP 1000, the AN/BQQ-5 Medium Frequency Active Improvement program and Improved Control Display Console Obsolete Equipment Replacement have been modified to become the basis of the Acoustics Rapid Commercial Off The Shelf Insertion program (A-RCI). A-RCI is a multi-phased, evolutionary development effort geared toward addressing Acoustic Superiority issues through the rapid introduction of interim development products applicable to SSN 688, 688I Flight, SSN21, and SSBN 726 Class Submarines. A-RCI Phases I and II introduce towed array processing improvements; A-RCI Phase III introduces spherical array processing improvements. The AN/BSY-1 High Frequency Upgrade is a stand-alone program which will be introduced as A-RCI Phase IV for SSN 688I only. Precision Bottom Mapping transition, integration and testing begin in FY01. Towed systems development efforts will focus on: (a) tow cable improvements for shallow water towing in littoral environments; (b) hydrophone and telemetry cost and risk reduction initiatives; (c) mechanical endurance improvements; and (d) TB-29 () towed array Engineering Developmental Model (EDM) development. Two full and one partial TB-29() EDMs are being procured in FY00 to support developmental and operational testing. AN/BSY-2 efforts will focus on Block 4 Upgrade, which resolves reliability and obsolescence issues and maximizes commonality with existing submarine combat systems under the Integrated Development Plan (IDP) to minimize life cycle costs.

(U) Program Accomplishments and Plans:

1. (U) FY 1998 Accomplishments:

- (U) (\$20.8) Conducted at-sea testing of A-RCI Phase I and Critical Design Review (CDR) of Phase III.
- (U) (\$14.1) Continued research, development, training and deployment of the Multipurpose processor.
- (U) (\$2.1) Continued transition of High Frequency (HF) Upgrade Arrays Designs to production and began First Article Test of HF Sensor and Transmit Equipment. Began transition of New SSN C3I developed High Frequency Processing Software to A-RCI for system integration and test.
- (U) (\$7.4) Completed TB-29 OPEVAL and performed TB-29() concept development and commenced Engineering Manufacturing Development.
- (U) (\$.9) Continued development for Desk Top Computer Improvements (DTC).

2. (U) FY 1999 Plan:

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Exhibit R-2a RDT&E Project Justification
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| Exhibit R-2a, RDT&E Project Justification | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N | PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219 |

| | | | | |
|----------------------------------|------|------|------|--|
| d. minor pricing adjustments | -7 | -3 | -5 | |
| e. fund precision bottom mapping | | | 2.1 | |
| FY 2000/01 PRES Budget Submit: | 45.3 | 48.9 | 40.0 | |

(U) Change Summary Explanation:

Funding: FY 1998 decreases of \$1.5M for Congressional Undistributed Reductions adjustment, \$1.0 SBIR reduction and \$.7M for minor pricing adjustment. FY 1999 decrease of \$.3M for minor pricing adjustments. FY2000 increases of \$4.2M for Towed Arrays and Handlers, \$3.2M to fund BSY-2 OER from R&D vice OPN, and \$2.1M to fund precision bottom mapping. \$.5M decrease for minor pricing adjustments.

Schedule: This submit establishes Acoustic Rapid Commercial Off-the-Shelf Insertion Phase I-IV program schedule.

Technical: A-RCI increases technical capabilities over programs through the use of commercial off –the- shelf components, open system architecture, and leveraging advanced development efforts.

B. (U) Other Program Funding Summary:

| | | | | | | | | | |
|----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------|--------------|
| OPN Line 21470 | | | | | | | | | |
| <u>FY1998</u> | <u>FY1999</u> | <u>FY2000</u> | <u>FY2001</u> | <u>FY2002</u> | <u>FY2003</u> | <u>FY2004</u> | <u>FY2005</u> | <u>To</u> | <u>Total</u> |
| 79.7 | 144.1 | 227.0 | 123.3 | 129.4 | 227.5 | 165.9 | 168.2 | Complete | Cost |
| | | | | | | | | CONT. | CONT. |

RELATED RDT&E:

- PE 0604524N (Submarine Combat Systems)
- PE 0604558N (New SSN Combat Systems Development)
- PE 0604561N (SSN-21 Development)
- PE 0604562N (Submarine Tactical Warfare System (ENG))

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| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT/NUMBER Submarine System Equipment Development/0604503N | PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219 |

C. (U) Acquisition Strategy: The TB-29() will be developed and manufactured under the US Navy Towed Systems Omnibus contract, awarded in FY99 to Lockheed Martin, Syracuse using full and open competition. This flexible contract vehicle will be used by submarine, surface ship, and surveillance towed system program offices. The contract is planned to take advantage of economies of scale in development and manufacturing and to encourage the use of commonality among all Navy towed systems. A Low-Rate Initial Production (LRIP) decision for TB-29 () is planned in FY00 based on developmental tests (DT-IIA). An Operational Evaluation (OPEVAL) on a SSN688 or SSN688I platform is planned in FY01 to support a Milestone III Release to Fleet (RTF) decision for TB-29().

A-RCI utilizes an open architecture and Commercial Off-the-Shelf products in support of new and upgraded sonar systems. A sole source cost plus award fee contract was awarded to Lockheed Martin Federal Systems. Program Review with Milestone Decision Authority was conducted in April 1998 granting approval for the FY98/99 production option.

D. (U) Schedule Profile: See attached schedules.

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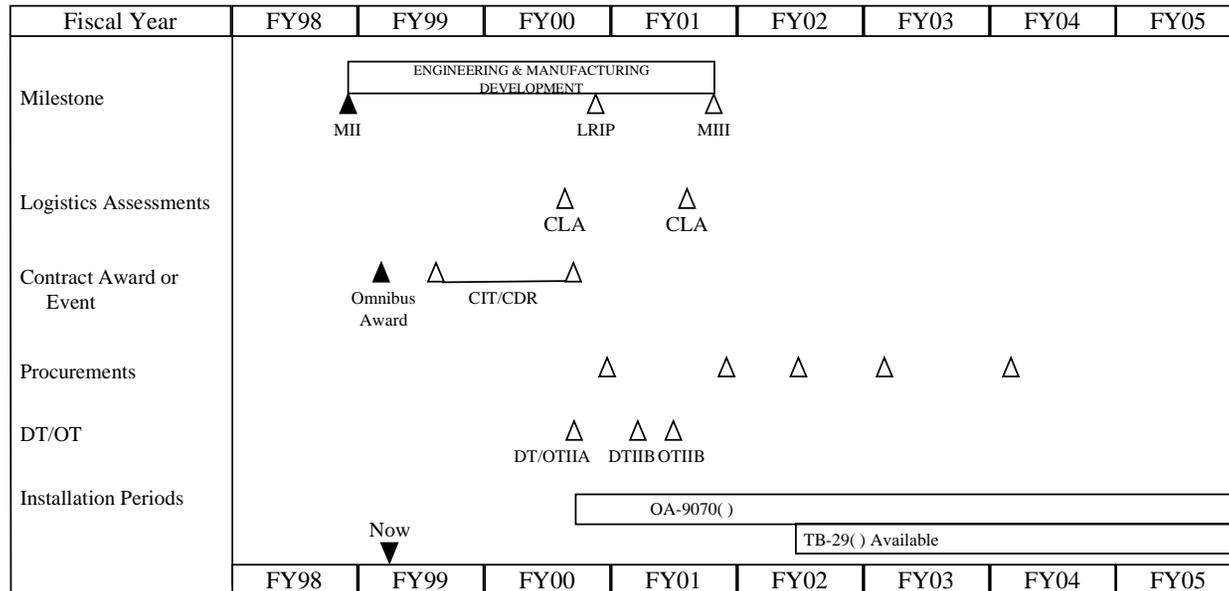
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Master Program Schedule TB-29() Development/Production

PROGRAM ELEMENT: 0604503N

PROJECT NUMBER: F0219



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| Exhibit R-3 Cost Analysis | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N | PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219 |

| Cost Categories (Tailor to WBS, or System/Item Requirements) | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY99 Cost | FY99 Award Date | FY00 Cost | FY00 Award Date | FY01 Cost | FY01 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|---|------------------------------|--------------------------------------|----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---------------------|---------------|--------------------------------|
| Primary Hardware Development | C/various | Lockheed Martin, Syr (OMNIBUS) | .3 | 5.6 | 12/98 | 6.6 | N/A | 1.4 | N/A | CONT. | CONT. | 23.14 |
| Primary Hardware Development | SS/various | Chesapeake Science | 1.4 | 1.2 | N/A | .8 | N/A | 0 | N/A | CONT. | CONT. | 6.62 |
| Primary Hardware Development | SS/CPAF | Lockheed Martin – Manassas, VA | 57.5 | 9.0 | 11/98 | 6.9 | 11/99 | 0 | N/A | 0 | 73.4 | 73.4 |
| Primary Hardware Development | SS/CPAF | Lockheed Martin – Manassas, VA | .3 | 5.5 | 11/98 | 1.5 | 11/99 | 1.8 | 11/00 | 0 | 7.6 | 7.6 |
| System Engineering | WR | NUWC Newport | 55.8 | 8.3 | 10/98 | 8.7 | 10/99 | 9.5 | 10/00 | CONT. | CONT. | N/A |
| System Engineering | SS/CPAF | LMC, Syracuse | 0 | 0 | N/A | 5.1 | 11/99 | 5.8 | 11/00 | CONT. | CONT. | N/A |
| Miscellaneous | Various | Various | | 4.2 | | 6.3 | | 5.6 | | CONT | CONT. | |
| Subtotal Product Development | | | 115.3 | 33.8 | | 35.9 | | 24.1 | | CONT. | CONT. | |
| <p>Remarks: The maximum award fee budgeted for the LMC, Syracuse contract averages 10% of the value placed on contract: 10/1/96 – 3/31/97 received a rating of outstanding and 100% award 4/1/97 – 9/30/97 received a rating of outstanding and 100% award 10/1/97 – 3/31/98 received a rating of above average and 80% award.</p> <p>The maximum award fee budgeted for the Lockheed Martin Federal Systems contract averages 12% of the value placed on contract. 8/1/96 – 12/31/96 received a rating of Excellent and 88.4% award. 1/1/97 – 6/30/97 received a rating of Outstanding and 100% award. 7/1/97 – 12/31/97 received a rating of Outstanding and 100% award.</p> <p>OMNIBUS Contract was awarded in 1st quarter FY99.</p> | | | | | | | | | | | | |
| Primary Software Development | SS/CPFF | Digital Systems Resources - VA | 16.3 | 13.2 | 11/98 | 0 | N/A | 0 | N/A | 0 | 17.5 | 17.5 |
| Subtotal Support | | | 16.3 | 13.2 | | 0 | | 0 | | 0 | 17.5 | 17.5 |

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Exhibit R-3 Project Cost Analysis
(Exhibit R-3, Page 15 of 26)

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| Exhibit R-3 Cost Analysis | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N | PROJECT NAME AND NUMBER Submarine Sonar Improvement / F0219 |

Remarks:

| Cost Categories (Tailor to WBS, or System/Item Requirements) | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY99 Cost | FY99 Award Date | FY00 Cost | FY00 Award Date | FY01 Cost | FY01 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|--|------------------------------|--------------------------------------|----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---------------------|---------------|--------------------------------|
| Developmental/Operational Test & Evaluation | Various | Various | 3.7 | 1.0 | N/A | 3.2 | N/A | 3.0 | N/A | CONT. | CONT. | N/A |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Subtotal T&E | | | 3.7 | 1.0 | | 3.2 | | 3.0 | | CONT. | CONT. | |

Remarks:

| | | | | | | | | | | | | |
|-----------------------------|---------|---------|----|----|-----|----|-----|----|-----|-------|-------|-----|
| Management Support Services | Various | Various | .7 | .7 | N/A | .7 | N/A | .7 | N/A | CONT. | CONT. | N/A |
| Travel | PD | NAVSEA | .2 | .2 | N/A | .2 | N/A | .2 | N/A | CONT. | CONT. | N/A |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Subtotal Management | | | .9 | .9 | | .9 | | .9 | | CONT. | CONT. | |

Remarks:

| | | | | | | | | | | | | |
|------------|--|--|-------|------|--|------|--|------|--|-------|-------|--|
| Total Cost | | | 136.2 | 48.9 | | 40.0 | | 28.0 | | CONT. | CONT. | |
|------------|--|--|-------|------|--|------|--|------|--|-------|-------|--|

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | Program Element Name & No. 0604503N Submarine System Equipment Development | Project Name and Number. Submarine Integrated Antenna System/ X0742 |

| Cost (\$ in Millions) | FY 1998 | FY 1999 | FY 2000 | FY 2001 | FY 2002 | FY 2003 | FY 2004 | FY 2005 | Cost to Complete | Total Cost |
|--|---------|---------|---------|---------|---------|---------|---------|---------|------------------|------------|
| Submarine Integrated Antenna System/ X0742 | 6.0 | 2.9 | 2.0 | 1.0 | 5.9 | 14.9 | 14.6 | 21.6 | Continuing | Continuing |
| RDT&E Articles Qty | N/A | N/A |

A. (U) Mission Description and Budget Item Justification: The Submarine Integrated Antenna System (SIAS) project provides submarines with antenna systems designed to: (a) permit greater operational flexibility through improved speed/depth performance; (b) improve reliability and availability; and (c) be compatible with existing and emerging communications systems. This project funds research and development for the communications Master Plan (Program Summary). It specifically funds the following developments: OE-538/BRC (Improved AN/BRA-34), High Speed Buoyant Cable Antennas (HSBCAs), Submarine Antenna Distribution Systems (SADS), High Data Rate Antennas (HDA), Extremely High Frequency (EHF), Super High Frequency (SHF), Phased Array Antennas (PAAs) and Global Positioning Systems (GPS).

(U) Program Accomplishments and Plans:

1. (U) FY 1998 Accomplishments:
 - (U) (\$3.9) HDA - Completed development, started developmental testing.
 - (U) (\$2.0) SADS - Assembled, integrated and tested. Performed developmental testing in support of op-assessment and LRIP.
 - (U) (\$1) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors and Reconnaissance (C4ISR) implementation guidance.
2. (U) FY 1999 Plan:
 - (U) (\$5) HDA – Support development and operational testing
 - (U) (\$2) OE-538 – Conduct and support development and operational testing. Initiate P3I for an enhanced UHF antenna to provide higher gain.
 - (U) (\$2.2) Antenna Transition Engineering – Provide system engineering, evaluate technology for submarine antenna applications, provide system architecture, and establish exit criteria for MSII. Also conduct FOT&E, P3I on Iridium antenna modification.
3. (U) FY 2000 Plan:
 - (U) (\$4) OE-538 – Initiate development for design changes required for Trident platform applications.
 - (U) (\$1.2) Antenna Transition Engineering – Evaluation of Transitional Antenna Technology, catalog data, and provide testing of critical antenna parameters to meet submarine platform requirements. \$1.0M plus-up for direct development of UHF SATCOM 3dB antenna gain. Investigate UAV link requirements and antenna modifications required to support this effort.
 - (U) (\$4) SADS – Conduct and support development and operational testing.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | Program Element Name & No. 0604503N Submarine System Equipment Development | Project Name and Number. Submarine Integrated Antenna System/ X0742 |

(U) Program Change Summary:

| | <u>FY 1998</u> | <u>FY 1999</u> | <u>FY 2000</u> |
|--|----------------|----------------|----------------|
| FY 1999 President's Budget: | 3.6 | 2.9 | 5.4 |
| Appropriated Value: | 3.6 | 2.9 | 0 |
| Adjustment to FY 1998 Appropriated Value/FY 1999 President's Budget: | | | |
| a. Deferral of phased array development. | | 0 | -4.4 |
| b. Minor pricing adjustment | -.1 | | |
| c. Below Threshold Reprogramming | 2.5 | | 1.0 |
| FY 2000/01 PRES Budget Submit: | 6.0 | 2.9 | 2.0 |

(U) Change Summary Explanation:

Funding:

- 1) FY98 funding increase of \$2.0M for High Data Rate (HDR) antenna unfunded requirements and \$.5 for SADS from X1411.
- 2) FY99 SADS program delayed to fund emergent higher priority requirements. Funds reallocated to Transition Engineering as higher priority effort.
- 3) FY00/01 funding decrease of \$4.4M and \$4.6M deferred phased array development two years due to budget constraints.
- 4) FY00 funding increase of \$1.0M to Antenna Transition Engineering for development of enhanced sensitivity on antenna systems.

Schedule:

- 1) SADS: 4QFY98 MS II A (LRIP) DTIIA/OT IIA deleted as LRIP is not required. Completed design and technical documentation. MSIIB deleted due to clarification of MSII ADM. 1QFY99 MSIII delayed to 3QFY99 due to program delay. All SADS program milestones reflect program delay.
- 2) HDR: Contract delivery of the Rapid Prototype (RP) development system delayed the first Production System award and delivery. All milestones have been adjusted to reflect impact of these schedule delays.
- 3) OE-538/BRC: Awarding contract delayed from July 97 to Sept 97 causing a one quarter delay in applicable milestones. OE-538/BRC OT-IIB testing continued into FY 1997 requiring redesign/test prior to MS III Decision. Due to testing considerations, MS III was changed to MSIIA (2QFY97) authorizing LRIP and deferring MSIII until FY 1999. Due to LRIP delayed delivery, MSIII is changed to MSIIB (2QFY99) and is deferred until FY2000.

Technical: Not applicable.

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | Program Element Name & No. 0604503N Submarine System Equipment Development | Project Name and Number. Submarine Integrated Antenna System/ X0742 |

B. (U) Other Program Funding Summary:

| <u>FY 1998</u> | <u>FY 1999</u> | <u>FY 2000</u> | <u>FY 2001</u> | <u>FY 2002</u> | <u>FY 2003</u> | <u>FY 2004</u> | <u>FY 2005</u> | <u>To Complete</u> | <u>Total Cost</u> |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------|-------------------|
| 41.5 | 60.3 | 85.4 | 68.0 | 68.3 | 77.4 | 85.7 | 104.1 | CONT. | CONT. |
| OPN Line 313000 Hardware and 313005 Installation (Full) | | | | | | | | | |

RELATED RDT&E:

PE 0602232N (Space and Electronic Warfare (SEW) Technology)

PE 0303109N (Satellite Communications) – Provides for the EHF transmitter and receiver that utilizes the antenna developed under this program.

C. (U) Acquisition Strategy:

| | <u>FY1998</u> | <u>FY1999</u> | <u>FY2000</u> | <u>FY2001</u> |
|------------------------|------------------------------------|---------------------------|--|---------------|
| Program Milestones | 3Q HDR MSIIA (LRIP) | 2Q OE-538/BRC MSIIB | 4Q HDR MSIII 1Q OE-538/BRC MSIII 3Q SADS MSIII | |
| Engineering Milestones | | | | |
| T&E Milestones | 3Q HDR DTII 4Q OE-538/BRC DTIIE | 2Q OE-538/BRC DTIIF/OTIIC | 3Q HDR DT/OT II 2Q SADS DTIIB/OTIIC | |
| Contract Milestones | 3Q HDR LRIP | 2Q HDR (LRIP)* | 2Q HDR (LRIP)* 1Q OE-538 (FRP) 3Q SADS(FRP) | 2Q HDR (FRP) |

* MS II decision for 9 LRIPs in FY 99 and 13 in FY 00.

D. (U) Schedule Profile: See paragraph C above

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| Exhibit R-3 Cost Analysis | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N | PROJECT NAME AND NUMBER Submarine Integrated Antenna System / X0742 |

| Cost Categories (Tailor to WBS, or System/Item Requirements) | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY99 Cost | FY99 Award Date | FY00 Cost | FY00 Award Date | FY01 Cost | FY01 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|--|------------------------------|--------------------------------------|----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---------------------|---------------|--------------------------------|
| Hardware Development | CPFF | Raytheon Marlboro, MA | 3.8 | 0 | N/A | 0 | N/A | 0 | N/A | 0 | 13.5 | 13.7 |
| Hardware Development | WX | NUWC Newport, RI | .8 | .9 | N/A | .4 | TBD | .4 | TBD | .8 | 2.8 | N/A |
| Software Development | Various | Various | .2 | .05 | various | .08 | various | .05 | various | N/A | N/A | N/A |
| Systems Engineering | Various | Various | .4 | .8 | various | 1.3 | various | .3 | various | N/A | N/A | N/A |
| Site Platform Integration | Various | Various | .1 | .1 | various | 0 | various | .08 | various | N/A | N/A | N/A |
| Subtotal Product Development | | | 5.3 | 1.9 | | 1.8 | | .8 | | | 6.4 | |

Remarks:

| | | | | | | | | | | | | |
|------------------------------|---------|---------|----|-----|---------|---|---------|-----|---------|-----|-----|-----|
| Integrated Logistics Support | Various | Various | .2 | .05 | various | 0 | various | .05 | various | N/A | N/A | N/A |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Subtotal Support | | | .2 | .05 | | 0 | | .05 | | | | |

Remarks:

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| Exhibit R-3 Cost Analysis | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N | PROJECT NAME AND NUMBER Submarine Integrated Antenna System / X0742 |

| Cost Categories (Tailor to WBS, or System/Item Requirements) | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY99 Cost | FY99 Award Date | FY00 Cost | FY00 Award Date | FY01 Cost | FY01 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|--|------------------------------|--------------------------------------|----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---------------------|---------------|--------------------------------|
| Development/Operational T&E | Various | Various | .1 | .7 | various | .1 | various | .03 | various | N/A | .93 | N/A |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Subtotal T&E | | | .1 | .7 | | .1 | | .03 | | | .93 | |
| Remarks: | | | | | | | | | | | | |
| Project Management Support | Various | Various | .4 | .2 | various | .1 | various | .1 | various | N/A | N/A | N/A |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Subtotal Management | | | .4 | .2 | | .1 | | .1 | | | . | |
| Remarks: | | | | | | | | | | | | |
| Total Cost | | | 6.0 | 2.9 | | 2.0 | | 1.0 | | | | |
| Remarks: | | | | | | | | | | | | |

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | Program Element Name & No. 0604503N Submarine System Equipment Development | Project Name and Number. Submarine Tactical Communication System / X1411 |

| Cost (\$ in Millions) | FY 1998 | FY 1999 | FY 2000 | FY 2001 | FY 2002 | FY 2003 | FY 2004 | FY 2005 | Cost to Complete | Total Cost |
|--|---------|---------|---------|---------|---------|---------|---------|---------|------------------|------------|
| Submarine Tactical Communication System/ X1411 | 4.7 | 7.5 | 5.8 | 5.0 | 9.7 | 5.6 | 5.4 | 5.5 | Continuing | Continuing |
| RDT&E Articles Qty | N/A | N/A |

A. (U) Mission Description and Budget Item Justification: The Submarine Tactical Communications System project provides attack submarines with communications systems designed to: (a) enhance data throughput through automation and integrated network management; (b) copy tactical data networks, such as Tactical Data Information Exchange System (TADIXS); (c) be interoperable with other U.S. and allied military networks; and (d) improve reliability, maintainability, and availability. This can be accomplished by providing the attack submarine with a properly integrated mix of Navy standard communication equipment covering a wide range of frequencies and modes. Included in this project is the Submarine Communications Support System (SCSS) which provides a system engineering approach for the design and evaluation of new and existing submarine radio rooms. In addition, the project provides support for the Land-Based Submarine Radio Room (LBSRR) for new systems evaluation and integration. The project includes system engineering efforts associated with demonstration of new technology which will allow the submarine to be a participant in battle group and joint operations. The new technology will increase the submarine's communications, command, and control capability. This project funds research for equipment in the OPNAV approved SCSS Program Summary. It specifically funds the development of the improved Submarine Message Buffer (SMB) and SCSS. These two efforts will develop the computer controlled radio room for submarines. Ships without SCSS capability will be limited in their interoperability with the rest of the Navy. Lastly, this program provides funds to integrate Joint Tactical Information Distribution System (JTIDS) into the SCSS and the transition to Multifunction Information Distribution System (MIDS).

(U) Program Accomplishments and Plans:

1. (U) FY 1998 Accomplishments:

- (U) (\$4.1) SCSS - Continued Design of FY99 Phase of SCSS (Phase II). SBCS IRM and System Integration.
- (U) (\$5) MIDS – Engineering/Integration and Development testing of MIDS/JTIDS
- (U) (\$1) Developed and updated Naval Command, Control, Communications, Computers, Intelligence, Sensors, and Reconnaissance (C4SIR) implementation guidance.

2. (U) FY 1999 Plan:

- (U) (\$4.7) SCSS – Complete Integration of FY99 Phase of SCSS (Phase II). Conduct landbased testing of FY99 Phase of SCSS (Phase II). Commence planning and design of FY01 Phase of SCSS (Phase III).
- (U) (\$2.8) Continue integration and development testing for MIDS/JTIDS.

3. (U) FY 2000 Plan:

- (U) (\$4.5) SCSS – complete design of FY01 Phase of SCSS (Phase III). Start Integration of FY01 Phase of SCSS (Phase III). Start planning and design of FY03 Phase of SCSS (Phase IV)

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| Exhibit R-2a, RDT&E Project Justification | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | Program Element Name & No. 0604503N Submarine System Equipment Development | Project Name and Number. Submarine Tactical Communication System / X1411 |

- (U) (\$1.3) MIDS – Continue integration and development testing for MIDS/JTIDS

(U) Program Change Summary:

| | <u>FY 1998</u> | <u>FY 1999</u> | <u>FY 2000</u> |
|--|----------------|----------------|----------------|
| FY 1999 President's Budget: | 5.4 | 7.6 | 5.9 |
| Appropriated Value: | 5.4 | 7.6 | |
| Adjustment to FY 1998 Appropriated Value/FY 1999 President's Budget: | | | |
| a. minor pricing adjustments | -.7 | -.1 | -.1 |
| FY 2000/01 PRES Budget Submit: | 4.7 | 7.5 | 5.8 |

(U) Change Summary Explanation:

Funding:

- 1.) FY1998 decrease of \$.2M for minor pricing adjustments and \$.5M reprogrammed to X0742.
- 2.) FY1999 decrease of \$.1M for minor pricing adjustments.
- 3.) FY2000 decrease of \$.1M for minor pricing adjustments.

Schedule: Not applicable.

Technical: Not applicable.

B. (U) Other Program Funding Summary:

| | <u>FY 1998</u> | <u>FY 1999</u> | <u>FY 2000</u> | <u>FY 2001</u> | <u>FY 2002</u> | <u>FY 2003</u> | <u>FY 2004</u> | <u>FY 2005</u> | <u>To Complete</u> | <u>Total Cost</u> |
|---|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------|-------------------|
| OPN Line 313000 Hardware and 313005 Installation (Full) | 41.5 | 64.6 | 86.8 | 69.2 | 65.5 | 78.9 | 87.5 | 106.4 | CONT | CONT |

RELATED RDT&E:

- PE 0204163N (Fleet Communications)
- PE 0602232N (Space & Electronic Warfare (SEW) Technology)

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| | Exhibit R-2a, RDT&E Project Justification | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | Program Element Name & No. 0604503N Submarine System Equipment Development | Project Name and Number. Submarine Tactical Communication System / X1411 |

C. (U) Acquisition Strategy: SCSS transforms multiple suites of class-specific, closed system equipment to a common submarine suite incorporating OSA communications equipment. The transition from today's existing submarine radio room to a hybrid SCSS should be completed within a 10-year period. The strategy makes use of common OSA and NDI acquisitions while actively seeking industry participation during the requirements definition and procurement process. SCSS strategy leverages emerging technologies and the implementation of block upgrades on a periodic basis that produces incremental integration of P3I and COTS systems.

- SCSS will:
- Apply a systems approach to design and implementation of JMCOMS.
 - Maximize use of COTS products and emerging technologies.
 - Use existing software modules as feasible.

| | <u>FY1999</u> | <u>FY2000</u> | <u>FY2001</u> |
|------------------------|---------------|---------------|----------------|
| Program Milestones | | | 2Q MSII (LRIP) |
| Engineering Milestones | | | 3Q DT/OT-IIC |
| T&E | | | |
| Contract Milestones | | | 3Q LRIP |

D. (U) Schedule Profile: See paragraph C

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| Exhibit R-3 Cost Analysis | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N | PROJECT NAME AND NUMBER Submarine Tactical Communication System / X1411 |

| Cost Categories (Tailor to WBS, or System/Item Requirements) | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY99 Cost | FY99 Award Date | FY00 Cost | FY00 Award Date | FY01 Cost | FY01 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|--|------------------------------|--------------------------------------|----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---------------------|---------------|--------------------------------|
| Hardware Development | CPFF | SSC-SD San Diego, CA | .7 | .8 | 10/98 | .6 | TBD | .5 | TBD | 1.8 | 4.4 | |
| Software Development | CPFF | SSC-SD San Diego, CA | .3 | .5 | 10/98 | .5 | TBD | .5 | TBD | 2.5 | 5.0 | |
| Software Development | WX | NUWC Newport, RI | 1.0 | 2.4 | various | 1.5 | TBD | 1.2 | TBD | 4.7 | 11.0 | N/A |
| Systems Engineering | Various | Misc. Labs | 1.3 | 1.6 | various | 1.4 | various | 1.3 | various | N/A | N/A | N/A |
| Subtotal Product Development | | | 3.8 | 5.3 | | 4.0 | | 3.5 | | | | |
| Remarks: | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Subtotal Support | | | 0 | 0 | | 0 | | 0 | | | | |
| Remarks: | | | | | | | | | | | | |

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| Exhibit R-3 Cost Analysis | | Date: February 1999 |
| APPROPRIATION/BUDGET ACTIVITY: RDT&E,N/5 | PROGRAM ELEMENT NAME AND NUMBER Submarine System Equipment Development / 0604503N | PROJECT NAME AND NUMBER Submarine Tactical Communication System / X1411 |

| Cost Categories (Tailor to WBS, or System/Item Requirements) | Contract Method & Type | Performing Activity & Location | Total PYs Cost | FY99 Cost | FY99 Award Date | FY00 Cost | FY00 Award Date | FY01 Cost | FY01 Award Date | Cost To Complete | Total Cost | Target Value of Contract |
|--|------------------------------|--------------------------------------|----------------------|--------------|-----------------------|--------------|-----------------------|--------------|-----------------------|---------------------|---------------|--------------------------------|
| Development/Operational T&E | Various | Various | .6 | 1.3 | various | 1.0 | various | .9 | various | N/A | N/A | N/A |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Subtotal T&E | | | .6 | 1.3 | | 1.0 | | .9 | | | | |
| Remarks: | | | | | | | | | | | | |
| Project Management Support | Various | Various | .8 | .9 | various | .8 | various | .6 | various | N/A | N/A | N/A |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| Subtotal Management | | | .8 | .9 | | .8 | | .6 | | | | |
| Remarks: | | | | | | | | | | | | |
| Total Cost | | | 4.7 | 7.5 | | 5.8 | | 5.0 | | | | |
| Remarks: | | | | | | | | | | | | |

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