

# UNCLASSIFIED

CLASSIFICATION:

EXHIBIT R-2, RDT&E Budget Item Justification

DATE:

**February 2002**

| APPROPRIATION/BUDGET ACTIVITY                             |  |  |  |  |  | R-1 ITEM NOMENCLATURE |              |               |         |         |         |         |         |                  |               |
|---|--|--|--|--|--|-----------------------|--------------|---------------|---------|---------|---------|---------|---------|------------------|---------------|
| <b>RESEARCH DEVELOPMENT TEST &amp; EVALUATION, NAVY /</b> |  |  |  |  |  | <b>BA-7</b>           |              |               |         |         |         |         |         |                  |               |
| COST (\$ in Millions)                                     |  |  |  |  |  | Prior Year Cost       | FY 2001      | FY 2002       | FY 2003 | FY 2004 | FY 2005 | FY 2006 | FY 2007 | Cost to Complete | Total Program |
| Total PE Cost   |  |  |  |  |  |                       | 38.544       | 28.080        | 60.758  | 76.192  | 95.602  | 90.166  | 67.346  | Continuing       | Continuing    |
| A1780* HARM Improvement                                   |  |  |  |  |  |                       | 9.029        | 12.221        | 3.901   | 2.113   | 1.842   | 3.845   | 3.886   | Continuing       | Continuing    |
| A2185* Advanced Anti-Radiation Guided Missile (AARGM)     |  |  |  |  |  |                       | **<br>26.741 | ***<br>14.570 | 48.710  | 54.712  | 69.416  | 69.278  | 59.254  | Continuing       | Continuing    |
| A2211* Modernized Hellfire**                              |  |  |  |  |  |                       | 2.774        | 1.289         | 8.147   | 14.492  | 6.473   | 4.158   | 4.206   | Continuing       | Continuing    |
| A3056 Advanced Precision Kill Weapons                     |  |  |  |  |  |                       |              |               |         | 4.875   | 12.907  | 12.885  |         | 30.667           |               |
| A3057 Common Defense Weapon System                        |  |  |  |  |  |                       |              |               |         |         | 4.964   |         |         | 4.964            |               |
| Quantity of RDT&E Articles                                |  |  |  |  |  | <b>Not Applicable</b> |              |               |         |         |         |         |         |                  |               |

\*Prior years funding was executed under project units E2185 and W2185.

\*\*The FY01 budget reflects a \$20M Congressional Add for AARGM executed under A2661 (\$15M for AARGM) and A2983 (\$5M for QuickBolt). These funds were reduced by \$.184 million for Congressional Reductions.

\*\*\* The FY02 budget reflects a \$14.7M Congressional Add for AARGM risk reduction efforts and producibility enhancements under A2661. These funds were reduced by \$.130 million for Congressional Reductions.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

(U) A1780/HIGH-SPEED ANTI-RADIATION (HARM) IMPROVEMENT: The International HARM Upgrade Program (IHUP) (Block IIIB/VI) is a tri-national Precision Navigation Unit (PNU) cooperative program consisting of a USN-unique tactical software upgrade and a hardware upgrade which includes an Inertial Measurement Unit (IMU) and a Global Positioning System (GPS) receiver. This upgrade will provide a much improved guidance capability for the current AGM-88B missile (in German and Italian inventories) and AGM-88C missile (in U.S. inventory). This IMU/GPS system will be retrofitted into existing missiles, as a kit.

(U) A2185/ADVANCED ANTI-RADIATION GUIDED MISSILE (AARGM) and A2661/AARGM (Congressional Add): AARGM is a Phase III Small Business Innovative Research (SBIR) program designed to demonstrate an advanced multi-mode seeker on an existing High speed Anti-Radiation Missile (HARM) airframe. A2983/QuickBolt (QB) is an Advanced Concept Technology Demonstration (ACTD) of Joint-suppression of Enemy Air Defense (J-SEAD) technology enhancements applicable to AARGM. An AARGM System Development and Demonstration (SD&D) will commence in FY03. The AARGM program plans production of 1,750 missiles (60 Low Rate Initial Production (LRIP) and 1,690 Full Rate Production modification kits). For ease of tracking, Project Units W2661, E2661, A2661, and A2983 are included in the A2185 funding profile.

(U) A2211/MODERNIZED HELLFIRE: Modernized Hellfire (MH) is the joint service program to support approved Army and USMC Mission Need Statements for future multi-role precision guided weapons. To fulfill these needs, the DON is participating with the Army in joint trade studies, requirements validation analysis, Advanced Technology Demonstration programs, hardware development, Analysis of Alternatives (AOA), and the development of Milestone support documentation. Specific potential applications include development of a single multi-role weapon to replace the legacy TOW, Maverick, and Hellfire missiles, as well as development of a low cost guidance capability for the legacy unguided 2.75" rocket system.

U) JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it encompasses engineering and manufacturing development for upgrade of existing, operational systems.

R-1 SHOPPING LIST - Item No. 186

# UNCLASSIFIED

**Exhibit R-2, RDTEN Budget Item Justification**  
(Exhibit R-2, page 1 of 21)

# UNCLASSIFIED

**CLASSIFICATION:**

|   |                 |  |         |         |         |   |         |                            |         |                  |               |
|---|-----------------|--|---------|---------|---------|---|---------|----------------------------|---------|------------------|---------------|
| EXHIBIT R-2a, RDT&E Project Justification                   |                 |  |         |         |         |   |         | DATE: <b>February 2002</b> |         |                  |               |
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N / BA-7</b> |                 | PROGRAM ELEMENT NUMBER AND NAME<br>0205601N HARM Improvement |         |         |         | PROJECT NUMBER AND NAME<br>A1780 HARM Improvement |         |                            |         |                  |               |
| COST (\$ in Millions)                                       | Prior Year Cost |  | FY 2001 | FY 2002 | FY 2003 | FY 2004   | FY 2005 | FY 2006                    | FY 2007 | Cost to Complete | Total Program |
| Project Cost  |                 |  | 9.029   | 12.221  | 3.901   | 2.113   | 1.842   | 3.845                      | 3.886   | Continuing       | Continuing    |
| RDT&E Articles Qty  |                 |  |         |         |         |   |         |                            |         |                  |               |

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The High-speed Anti-Radiation Missile (HARM) is a joint service program with the Air Force (NAVY lead). The program has been in full production since FY 1983. Program Element 0205601N was used until FY 1990 to develop and test one hardware and two software upgrades to the HARM as Engineering Change Proposals (ECPs). Another ECP software program (Block V) was recently developed (FY96 through FY99) to modify HARM software in order to meet operational requirements. The Block V tactical software upgrade gives HARM improved geographic specificity and improved capability against advanced waveforms. HARM Block V software was distributed to the Fleet in FY00.

The International HARM Upgrade Program (IHUP)/Precision Navigation Unit (PNU) is a tri-national (U.S., Italy, and Germany) cooperative program designed to improve the HARM's effectiveness by enhancing the missile's probability of kill and reducing the potential for fratricide while making the missile easier to employ. The Program consists of significant hardware and software modifications to the missile's control and guidance sections. The USN frequently refers to the IHUP upgrade as Block IIIB/VI. The three nations involved have agreed to jointly fund the design, development, testing and production of hardware kits to be installed in the missile control section along with an improved software version to be installed in the missile guidance section. The HARM Block IIIB/VI program started development in FY98 and will commence production in FY03. Funding in FY00 through FY03 is dedicated to the HARM Block IIIB/IV program.

# UNCLASSIFIED

**CLASSIFICATION:**

| EXHIBIT R-2a, RDT&E Project Justification  |                                  | DATE:                         |
|--|----------------------------------|-------------------------------|
| APPROPRIATION/BUDGET ACTIVITY  | PROGRAM ELEMENT NUMBER AND NAME  | PROJECT NUMBER AND NAME       |
| <b>RDT&amp;E, N / BA-7</b>   | <b>0205601N HARM Improvement</b> | <b>A1780 HARM Improvement</b> |
| <p>1. FY 2001 ACCOMPLISHMENTS:</p> <p>(U) (\$5.266) Continued design/development of Inertial Measurement sub-systems and development of hardware and software associated with Block IIIB/VI. Continued development of Block VI USN unique software sub-routines.</p> <p>(U) (\$.256) Continued Engineering and Project Management Services in support of the HARM Upgrade Program (Block IIIB/VI) contract.</p> <p>(U) (\$1.027) Continued Government engineering support of the HARM Upgrade Program (Block IIIB/VI) including preparation for Critical Design Review of Block VI software/hardware design. Effort includes further engineering studies, threat analysis, 6 Degrees of Freedom (DOF) analysis, documentation analysis, interface definition, precision navigation engineering, and software quality evaluation.</p> <p>(U) (\$.145) Continued Government support of contractor testing including evaluation of test plans, reports, and preparation of detailed test planning documentation, and captive flight testing. Coordinated/attended/chaired the Joint Test Plan Working Group and coordinate necessary program activities in support of future year Development Test/Operational Test (DT/OT).</p> <p>(U) (\$.176) Continued Government logistic support including logistics support analyses, maintenance engineering, support equipment engineering, and evaluating contractor designs.</p> <p>(U) (\$2.159) Continued Government and contractor participation in integration efforts. Continued developing the aircraft avionics updates required by the HARM Upgrade Program (Block VI) in addition to Command Launch Computer (CLC)/TAMPS upgrade efforts. Continued to develop HARM TAMPS/Mission Planning Module (MPM) rehost.</p> |                                  |                               |

R-1 SHOPPING LIST - Item No. 186

**UNCLASSIFIED**

**Exhibit R-2, RDTEN Budget Item Justification**  
(Exhibit R-2, page 3 of 21)

# UNCLASSIFIED

**CLASSIFICATION:**

| EXHIBIT R-2a, RDT&E Project Justification   |                                  | DATE:                         |
|---|----------------------------------|-------------------------------|
| APPROPRIATION/BUDGET ACTIVITY   | PROGRAM ELEMENT NUMBER AND NAME  | PROJECT NUMBER AND NAME       |
| <b>RDT&amp;E, N / BA-7</b>  | <b>0205601N HARM Improvement</b> | <b>A1780 HARM Improvement</b> |
| <p>2. FY2002 PLAN:</p> <p>(U) (\$3.680) Continue design/development of Inertial Measurement sub-systems and development of hardware and software associated with Block IIIB/VI. Continue development of Block VI USN unique software sub-routines.</p> <p>(U) (\$.252) Continue Engineering and Project Management Services in support of the HARM Upgrade Program (Block IIIB/VI) contract.</p> <p>(U) (\$.803) Continue Government engineering support of the HARM Upgrade Program (Block IIIB/VI) including preparation for Production Readiness Reviews of Block VI software/hardware design. Effort includes further engineering studies, documentation analysis, interface definition, precision navigation engineering, and software quality evaluation.</p> <p>(U) (\$.720) Continue Government support of contractor testing including evaluation of test plans, reports, and preparation of detailed test planning documentation, and captive flight testing. Coordinate/attend/chair the Joint Test Plan Working Group and coordinate necessary program activities in support of combined DT/OT. Continue to provide on site support to DT/OT and perform data reduction, test matrix review and prepare DT report.</p> <p>(U) (\$.886) Continue Government logistic support including logistics support analyses, maintenance engineering, support equipment engineering, and evaluating contractor designs.</p> <p>(U) (\$3.310) Continue Government and contractor participation in integration efforts. Continue developing the aircraft avionics updates required by the HARM Upgrade Program (Block VI) in addition to Command Launch Computer (CLC)/TAMPS upgrade efforts, TACMAN and part Task Trainer updates, and ELINT development. Continue to develop HARM TAMPS/Mission Planning rehost.</p> <p>(U) (\$2.200) Redesign Guided Missile Launcher Test Set (GMLTS) to develop capability to verify and test PNU upgrade configuration during missile reprogramming.</p> <p>(U) (\$.370) Portion of extramural program reserved for Small Business innovation Research assessment in accordance with 15USC 68.</p> |                                  |                               |

R-1 SHOPPING LIST - Item No. 186

**UNCLASSIFIED**

**Exhibit R-2, RDTEN Budget Item Justification**  
(Exhibit R-2, page 4 of 21)

# UNCLASSIFIED

**CLASSIFICATION:**

| EXHIBIT R-2a, RDT&E Project Justification   |   | DATE:                |
|---|---|----------------------|
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N / BA-7</b>   | PROGRAM ELEMENT NUMBER AND NAME<br><b>0205601N HARM Improvement</b> | <b>February 2002</b> |
| 3. FY 2003 PLAN:<br><br>(U) (\$.200) Continue Engineering and Project Management Services in support of the HARM Upgrade Program (Block IIIB/VI) contract.<br><br>(U) (\$.997) Continue Government Independent Operation Test and Evaluation support of the HARM Upgrade Program (Block IIIB/VI). Prepare Operational Testing final report. Conduct Product Assessment Review of test units in support of production readiness analysis. Initiate Engineering Change Proposal development,<br><br>(U) (\$.200) Initiate and review the development of Engineering Change Proposal requirements/design changes.<br><br>(U) (\$.635) Continue Government logistic support including logistics support analyses, maintenance engineering, support equipment engineering, and evaluating contractor designs.<br><br>(U) (\$1.869) Continue Government participation in integration efforts. Continue developing the aircraft avionics updates required by HARM, Command Launch Computer (CLC)/TAMPS upgrade efforts, TACMAN and part Task Trainer updates, and ELINT development to enable HARM to meet current and evolving threats. Continue to develop HARM TAMPS/Mission Planning rehost. |   |                      |

R-1 SHOPPING LIST - Item No. 186

**UNCLASSIFIED**

**Exhibit R-2, RDTEN Budget Item Justification**  
(Exhibit R-2, page 5 of 21)

# UNCLASSIFIED

CLASSIFICATION: **Unclassified**

|   |  |   |                |                |  |                               |                |                    |
|---|--|---|----------------|----------------|--|-------------------------------|----------------|--------------------|
| EXHIBIT R-2a, RDT&E Project Justification                   |  |   |                |                |  | DATE:<br><b>February 2002</b> |                |                    |
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N / BA-7</b> |  | PROGRAM ELEMENT NUMBER AND NAME<br><b>0205601N HARM Improvement</b> |                |                | PROJECT NUMBER AND NAME<br><b>A1780 HARM Improvement</b> |                               |                |                    |
| <b>(U) B. PROGRAM CHANGE SUMMARY:</b>                       |  |   |                |                |  |                               |                |                    |
|   | <u>FY2001</u>  | <u>FY2002</u>   | <u>FY2003</u>  |                |  |                               |                |                    |
| (U) FY 2002 President's Budget:                             | 9.368  | 12.330  |                |                |  |                               |                |                    |
| (U) Adjustments from the President's Budget:                | -0.339   | -0.109  |                |                |  |                               |                |                    |
| (U) FY 2003 President's Budget Submit:                      | 9.029  | 12.221  | 3.901          |                |  |                               |                |                    |
| <br><b>CHANGE SUMMARY EXPLANATION:</b>                      |  |   |                |                |  |                               |                |                    |
| (U) Funding:  | FY2001 reflects a decrease of \$.339 resulting from a \$.308 million decrease for Small Business Innovative Research (SBIR) Assessment and a \$.031 million decrease for reprioritization of requirements within the Navy.<br>FY2002 reflects a decrease of \$.109 million for an undistributed Congressional reduction. |   |                |                |  |                               |                |                    |
| (U) Schedule:   | Reflects slippage of FTR by one quarter and slippage of the Combined DT/OT by two quarters as a result of delayed delivery of the Global Positioning System (GPS) units being incorporated in the HARM Precision Navigation Upgrade Engineering Evaluation Units. Milestone III decision date will not be affected.      |   |                |                |  |                               |                |                    |
| (U) Technical:  | Not applicable.  |   |                |                |  |                               |                |                    |
| <br><b>(U) C. OTHER PROGRAM FUNDING SUMMARY:</b>            |  |   |                |                |  |                               |                |                    |
| <u>Line Item No. &amp; Name</u>                             | <u>FY 2001</u>   | <u>FY 2002</u>  | <u>FY 2003</u> | <u>FY 2004</u> | <u>FY 2005</u>   | <u>FY 2006</u>                | <u>FY 2007</u> | <u>To Complete</u> |
| WPN BLI 232700, HARM MODS                                   | 0  | 0   | 4.959          | 8.018          | 8.197  | 8.417                         | 8.639          | 0                  |
| Related RDT&E: Not applicable.                              |  |   |                |                |  |                               |                |                    |

R-1 SHOPPING LIST - Item No. 186

Unclassified

# UNCLASSIFIED

**Exhibit R-2, RDTEN Budget Item Justification**  
(Exhibit R-2, page 6 of 21)

# UNCLASSIFIED

**CLASSIFICATION:**

|   |   |  |
|---|---|--|
| EXHIBIT R-2a, RDT&E Project Justification                   |   | DATE:<br><b>February 2002</b>                            |
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N / BA-7</b> | PROGRAM ELEMENT NUMBER AND NAME<br><b>0205601N HARM Improvement</b> | PROJECT NUMBER AND NAME<br><b>A1780 HARM Improvement</b> |

(U) D. ACQUISITION STRATEGY:

The HARM Block IIIB/VI Upgrade program is an ACAT III Program and will consist of three separate phases (EMD, Production, and Technology Evaluation and Assessment). The acquisition strategy for the HARM Block IIIB/VI Program is complete and is based upon a signed international Memorandum of Agreement with Germany, Italy, and the U.S. Navy; a tri-national Cooperative Operational Requirements Document (CORD) details German, Italian, and U.S. Navy common requirements; and a Cooperative Test and Evaluation Master Plan (CTEMP) summarizes all test requirements. These three documents drive the overall acquisition approach to the HARM Block VI project.

Management of the Block IIIB/VI upgrade will be directed by a trilateral Steering Committee, however, the U.S. Navy Project Manager (in concert with Project Managers from Germany and Italy) is responsible for Program execution. Each partner will share one-third of "common costs," the U.S. Navy will fund Block VI unique costs, and the German and Italian participants will fund Block IIIB unique costs. Each country will pay its own aircraft integration costs.

The acquisition strategy delineates Industry and Government responsibilities. The contract strategy (i.e. hardware and software for missile, upgraded missile sections, contractor team responsibility for missile performance) assigns unique work tasks to each firm. Contract strategy is to issue contracts to Bodenseewerk Geratetechnik GmbH (BGT) (German), Alenia Marconi System (AMS) (Italian), and Raytheon Missile Systems (RMS) (U.S.) firms and will maximize use of commercial-off-the-shelf (COTS)/government-off-the-shelf (GOTS)/non-development items (NDI). Each Phase I (EMD) contract type and structure is tailored to the product of each firm.

The IHUP Production Memorandum of Agreement (MOA) will include a production run of only five years with a product of relatively low price. The current IHUP sources producing EMD and LRIP units are planned to produce the production units under the HARM Mods WPN Appropriation Line Item 2032700. The acquisition strategy has been restructured to include a Low Rate Initial Production (LRIP) which will commence in FY03 under the PNU Modification Program. The current IHUP sources producing EMD and LRIP units are planned to produce the production units.

(U) E. SCHEDULE PROFILE:

|                            | <u>FY 2001</u>                  | <u>FY 2002</u>                | <u>FY 2003</u> | <u>To Complete</u> |
|----------------------------|---------------------------------|-------------------------------|----------------|--------------------|
| (U) Program Milestones     |                                 |                               | MS III (4Q/03) |                    |
| (U) Engineering Milestones | CDR(2Q/01)                      | FTRR(2Q/02)                   |                |                    |
| (U) T&E Milestones         | Combined DT/OT<br>(Start 2Q/01) | Combined DT/OT<br>(End 4Q/02) |                |                    |

\* BGT and AMS Contracts are not funded with U.S. funds, but are significant milestones in the Block IIIB/VI contract schedule.

**UNCLASSIFIED**

**CLASSIFICATION:**

| Exhibit R-3 Cost Analysis (page 1) |                        |                                |                           |            |                  |                               |                  |            |                  | DATE: <b>February 2002</b> |            |                          |
|------------------------------------|------------------------|--------------------------------|---------------------------|------------|------------------|-------------------------------|------------------|------------|------------------|----------------------------|------------|--------------------------|
| APPROPRIATION/BUDGET ACTIVITY      |                        |                                | PROGRAM ELEMENT           |            |                  | PROJECT NUMBER AND NAME       |                  |            |                  |                            |            |                          |
| <b>RDT&amp;E, N / BA-7</b>         |                        |                                | 0205601N HARM Improvement |            |                  | <b>A1780 HARM Improvement</b> |                  |            |                  |                            |            |                          |
| Cost Categories                    | 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 |
| Block IIIB/VI Development          | C/CPIF                 | RSC, Tuc AZ                    | 6.535                     | 5.266      | 11/00            | 5.880                         | 11/01            |            |                  |                            | 17.681     | 17.681                   |
| Block VI Development/ECP           | WX                     | NAWC WD, China Lake, CA        | 1.442                     | 1.027      | 10/00            | 0.803                         | 10/01            | 0.200      | 10/02            | Continuing                 | Continuing |                          |
| Block VI ILS                       | WX                     | NAWC WD, Point Mugu, Ca        | 0.434                     | 0.176      | 10/00            | 0.886                         | 10/01            | 0.635      | 10/02            | Continuing                 | Continuing |                          |
|                                    |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
| Subtotal Product Development       |                        |                                | 8.411                     | 6.469      |                  | 7.569                         |                  | 0.835      |                  | Continuing                 | Continuing |                          |
| Remarks:                           |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
| Subtotal Support                   |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
| Remarks:                           |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |

**UNCLASSIFIED**

CLASSIFICATION:

| Exhibit R-3 Cost Analysis (page 2) |                        |                                |                           |            |                  |                               |                  |            |                  | DATE: <b>February 2002</b> |            |                          |
|------------------------------------|------------------------|--------------------------------|---------------------------|------------|------------------|-------------------------------|------------------|------------|------------------|----------------------------|------------|--------------------------|
| APPROPRIATION/BUDGET ACTIVITY      |                        |                                | PROGRAM ELEMENT           |            |                  | PROJECT NUMBER AND NAME       |                  |            |                  |                            |            |                          |
| <b>RDT&amp;E, N / BA-7</b>         |                        |                                | 0205601N HARM Improvement |            |                  | <b>A1780 HARM Improvement</b> |                  |            |                  |                            |            |                          |
| Cost Categories                    | 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 |
| Block IIIB/VI                      | WX                     | NAWC WD, China Lake, CA        | 1.691                     | 0.145      | 10/00            | 0.720                         | 10/01            | 0.997      | 10/02            | Continuing                 | Continuing |                          |
| HARM Technical/Integration Studies | WX                     | NAWC WD, China Lake, CA        | 5.304                     | 2.159      | 10/00            | 3.310                         | 10/01            | 1.869      | 10/02            | Continuing                 | Continuing |                          |
|                                    |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
| Subtotal T&E                       |                        |                                | 6.995                     | 2.304      |                  | 4.030                         |                  | 2.866      |                  | Continuing                 | Continuing |                          |
| Remarks:                           |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
| Block VI Travel                    | WX                     | NAWCAD, Patuxent, MD           | 0.190                     | 0.087      | 10/00            | 0.052                         | 10/01            | 0.030      | 10/02            | Continuing                 | Continuing |                          |
| Block VI Tech Assess/Mgmt Sup      | RX                     | DCS, Norfolk VA                | 1.205                     | 0.169      | 02/01            | 0.200                         | 12/01            | 0.170      | 12/02            |                            | 1.745      | 1.745                    |
| SBIR Assessment                    |                        |                                |                           |            |                  | 0.370                         |                  |            |                  |                            | 0.370      |                          |
|                                    |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
| Subtotal Management                |                        |                                | 1.395                     | 0.256      |                  | 0.622                         |                  | 0.200      |                  | Continuing                 | Continuing |                          |
| Remarks:                           |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |
| Total Cost                         |                        |                                | 16.801                    | 9.029      |                  | 12.221                        |                  | 3.901      |                  | Continuing                 | Continuing |                          |
| Remarks:                           |                        |                                |                           |            |                  |                               |                  |            |                  |                            |            |                          |

R-1 SHOPPING LIST - Item No. 186

**UNCLASSIFIED**

Exhibit R-2, RDTEB Budget Item Justification  
(Exhibit R-2, page 9 of 21)

# UNCLASSIFIED

**CLASSIFICATION:**

| EXHIBIT R-2a, RDT&E Project Justification |                                 |  |         |         |         |   |         | DATE: <b>February 2002</b> |         |                  |               |
|---|---------------------------------|--|---------|---------|---------|---|---------|----------------------------|---------|------------------|---------------|
| APPROPRIATION/BUDGET ACTIVITY             | PROGRAM ELEMENT NUMBER AND NAME |  |         |         |         | PROJECT NUMBER AND NAME                               |         |                            |         |                  |               |
| <b>RDT&amp;E, N / BA-7</b>                | 0205601N HARM Improvement       |  |         |         |         | A2185* Advanced Anti-Radiation Guided Missile (AARGM) |         |                            |         |                  |               |
| COST (\$ in Millions)                     | Prior Year Cost                 |  | FY 2001 | FY 2002 | FY 2003 | FY 2004   | FY 2005 | FY 2006                    | FY 2007 | Cost to Complete | Total Program |
| Project Cost                              |                                 |  | 26.741  | 14.570  | 48.710  | 54.712  | 69.416  | 69.278                     | 59.254  | Continuing       | Continuing    |
| RDT&E Articles Qty                        |                                 |  |         |         |         |   |         |                            |         |                  |               |

\*The FY01 budget reflects a \$20M Congressional Add: \$15M for AARGM producibility enhancements under A2661, and \$5M for the QuickBolt ACTD under A2983. These funds were reduced by \$.184 million for Congressional Reductions.

\*\* The FY02 budget reflects a \$14.7M Congressional Add for AARGM risk reduction efforts and producibility enhancements under A2661. These funds were reduced by \$.130 million for Congressional Reductions.

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

The Advanced Anti-Radiation Guided Missile (AARGM) Project transitions a Phase III Small Business Innovative Research (SBIR) program to develop and demonstrate a multi-mode guidance section on a HARM airframe to System Development and Demonstration (SD&D) in FY03. The AARGM Phase III SD&D program is designed to integrate a Multi-mode (passive Anti-Radiation Homing (ARH)/active Millimeter Wave (MMW) Radar/Global Positioning system/Inertial Navigation System (GPS/INS) on the HARM missile to engage and destroy enemy air defenses in the event that these systems "shut-down" or employ other countermeasures.

The issue of emitter "shut-down" as a defensive tactic has been a major shortcoming in the joint suppression of enemy air defenses (J-SEAD) element of the offensive counter air mission area for the United States Navy and Air Force. Program objectives are to achieve an effective and affordable lethal SEAD capability against mobile, relocatable, or fixed air defense threats even in the presence of emitter shutdown or other Anti-Radiation Missile (ARM) countermeasures. The multi-mode technology being integrated in the AARGM program resolves the problem of "shut-down".

The AARGM Advanced Technology Demonstration ATD technology demonstration program was an outgrowth of a Phase I and II competitive SBIR program. Phase I and II SBIR efforts successfully demonstrated the feasibility of a multi-mode seeker to address radar "shut-down" issues. Science and Applied Technology (SAT), Inc. (San Diego, CA), was awarded Phase I and II contracts (FY90-93) and was subsequently selected for a Phase III demonstration in FY94. Phase III ATD work is being performed by SAT under NAVAIR contract N00019-94-C-0078. This contractual effort will result in a cumulative contract value of \$183.9M. The AARGM ATD will complete in FY 2002. The AARGM program is the vehicle for the Quick Bolt Advanced Concept Technology Demonstration (ACTD). Quick Bolt adds the ability to receive threat data from national assets, enlarging the target set and increasing aircrew situational awareness, and to transmit a Weapon Impact Assessment (WIA) message to assist in the critical area of Battle Damage Assessment (BDA). The Quick Bolt ACTD is planned for completion in FY 2003. AARGM will commence System Development and Demonstration (SD&D) in FY03. The AARGM/QB program plans production of 1,750 missiles (60 Low Rate Initial Production (LRIP) modification kits and 1,690 Full Rate Production kits).

# UNCLASSIFIED

**CLASSIFICATION:**

|  |   |  |
|--|---|--|
| EXHIBIT R-2a, RDT&E Project Justification  |   | DATE:<br><b>February 2002</b>  |
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N / BA-7</b>  | PROGRAM ELEMENT NUMBER AND NAME<br><b>0205601N HARM Improvement</b> | PROJECT NUMBER AND NAME<br><b>A2185 Advanced Anti-Radiation Guided Missile (AARGM)</b> |
| <p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>1. FY 2001 ACCOMPLISHMENTS:</p> <p>(U) (\$3,348) Contractor completed captive flight testing of the AARGM brassboard. Contractor completed development of AARGM prototype Guided Test Vehicle (GTV), to include hardware/software design upgrades, subsystems assembly and test, prototype integration and testing, and prototype captive carry test and data analysis. The GTV-1 missile firing was successfully conducted and all test objectives achieved in 4Q01.</p> <p>(U) (\$3,459) Field activity completed AARGM system engineering support of development and systems integration efforts. Completed weapon system testing studies to assess weapons technology performance and deficiencies.</p> <p>(U) (\$.768) Contractor performed program management and engineering services in support of the AARGM technology demonstration program. Provided technical management support and coordination of AARGM Program weapons system technology studies</p> <p>(U) (\$14,371) Contractor continued Risk Reduction and Producibility (RR/PE) enhancement activities including performance and affordability enhancements of the Anti-Radiation Homing (ARH) receiver, the MillimeterWave (MMW) Radar Transceiver, the Composite Radome, and the ARH Full-Band Antenna Array. Related efforts included plating of frequency selective surface onto the Pyrocevam Radome and radar gimbal design trades.</p> <p>(U) (\$4,700) Contractor continued Quick Bolt Advanced Concept Technology Demonstration (ACTD) activities to demonstrate the utility of integrating off board sensor cueing into a new HARM seeker and the utility of providing Weapon Impact Assessment data for BDA cueing. The Quick Bolt System Requirements Review and System Design Review were completed.</p> <p>(U) (\$.095) Completed Government technical management, engineering support, and coordination of AARGM Program weapons system technology development program.</p> |   |  |

R-1 SHOPPING LIST - Item No. 186

**UNCLASSIFIED**

**Exhibit R-2, RDTEN Budget Item Justification**  
(Exhibit R-2, page 11 of 21)

# UNCLASSIFIED

**CLASSIFICATION:**

| EXHIBIT R-2a, RDT&E Project Justification   |                                  | DATE:   |
|---|----------------------------------|---|
| APPROPRIATION/BUDGET ACTIVITY   | PROGRAM ELEMENT NUMBER AND NAME  | PROJECT NUMBER AND NAME                                     |
| <b>RDT&amp;E, N / BA-7</b>  | <b>0205601N HARM Improvement</b> | <b>A2185 Advanced Anti-Radiation Guided Missile (AARGM)</b> |
| <p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>2. FY 2002 Plan:</p> <p>(U) (\$11,600) Contractor to complete Risk Reduction and Producibility activities including ARH receiver development, ARH Full-Band development and MMW tactical waveform development.</p> <p>(U) (\$2,310) Field activity to continue to provide AARGM system engineering and testing support associated with ATD.</p> <p>(U) (\$.600) Contractor to perform engineering and technical evaluation services to support program management of AARGM.</p> <p>(U) (.060) Government to provide technical management, engineering support, and coordination of AARGM ATD activities including preparation for and conduct of Milestone B for AGM-88E AARGM SD&amp;D.</p> <p>3. FY 2003 Plan:</p> <p>(U) (\$24,000) Contractor to commence System Development &amp; Demonstration (SD&amp;D) effort. Contractor to conduct Integrated Baseline Review (IBR). Contractor to update the Advanced Technology Demonstration (ATD) subsystem designs to the SD&amp;D System Performance Specification and prepare for System Design Review (SDR). Contractor to conduct SDR.</p> <p>(U) (\$8,710) Field activity to commence AARGM system engineering support associated with SD&amp;D.</p> <p>(U) (\$1,875) Contractor to perform engineering and technical evaluation services to support program management of AARGM.</p> <p>(U) (\$.125) Government to provide technical management, engineering support, and coordination of AARGM Program weapons system technology development program.</p> <p>(U) (\$14,000) Contractor to complete Quick Bolt Advanced Concept Technology Demonstration (ACTD) activities to demonstrate the utility of integrating off board sensor cueing into a new HARM seeker and the utility of providing Weapon Impact Assessment data for BDA cueing. Contractor to support Military Utility Assessment activities including hardware in-the-loop testing, field testing, and missile live firings. Contractor to deliver residual ACTD assets.</p> |                                  |   |

R-1 SHOPPING LIST - Item No. 186

**UNCLASSIFIED**

**Exhibit R-2, RDTE Budget Item Justification**  
(Exhibit R-2, page 12 of 21)

# UNCLASSIFIED

CLASSIFICATION:

|   |   |  |
|---|---|--|
| EXHIBIT R-2a, RDT&E Project Justification                   |   | DATE:<br><b>February 2002</b>  |
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N / BA-7</b> | PROGRAM ELEMENT NUMBER AND NAME<br><b>0205601N HARM Improvement</b> | PROJECT NUMBER AND NAME<br><b>A2185 Advanced Anti-Radiation Guided Missile (AARGM)</b> |

(U) B. PROGRAM CHANGE SUMMARY:

|  | FY2001 | FY2002 | FY2003 |
|--|--------|--------|--------|
| (U) FY 2002 President's Budget:              | 27.717 | 0      |        |
| (U) Adjustments from the President's Budget: | -0.976 | 14.570 |        |
| (U) FY 2003 President's Budget Submit:       | 26.741 | 14.570 | 48.710 |

CHANGE SUMMARY EXPLANATION:

- (U) Funding: FY2001 reflects a decrease of \$.976 million including a \$.946 million reduction for Small Business Innovative Research (SBIR) Assessment and \$.030 million reduction for reprioritization of requirements within the Navy.  
FY2002 reflects an increase of \$14.570 million resulting from an increase of \$14.700 million for AARGM and a decrease of \$.130 million for an undistributed Congressional reduction.
- (U) Schedule: The scheduled completion of the AARGM ATD program slipped from 4Q01 to 2Q02 as a result of delays associated with Captive Flight Testing. Captive Flight Testing delays were driven by challenges with flight qualification of the Anti-radiation Homing Receiver hardware, vibration failure with Global Positioning System hardware, test aircraft availability, and foul weather. GTV Live Fire Test and Analysis commenced in 4/01 and will complete in 2Q/02.
- (U) Technical: Reflects definition of tasks associated with the FY02 Congressional Add for Risk Reduction/Producibility enhancements.

(U) C. OTHER PROGRAM FUNDING SUMMARY:

| <u>Line Item No. &amp; Name</u> | <u>FY 2001</u> | <u>FY 2002</u> | <u>FY 2003</u> | <u>FY 2004</u> | <u>FY 2005</u> | <u>FY 2006</u> | <u>FY 2007</u> | <u>To Complete</u> |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------|
| WPN BLI 232700, HARM MODS       | 0              | 0              | 0              | 0              | 0              | 24.689         | 35.486         | Continuing         |

Related RDT&E: Not applicable

(U) D. ACQUISITION STRATEGY:

The AARGM program started as a Phase I Small Business Innovative Research (SBIR), Advanced Technology Program (ATD), and has evolved into a Phase III SBIR program transitioning into System Development and Demonstration (SD&D). The AARGM SD&D fulfills U.S. Navy operational requirements and the SD&D incorporates AARGM system requirements. Small Business Administration Code of Regulation rules for Phase III SBIRs are being used for this SD&D. Government responsibilities for both the ATD and SD&D include monitoring, technical assessment and validation of contractor technology development and testing.

The Quick Bolt Advanced Concept Technology Demonstration (ACTD) will be completed in FY03 and transitioned into the AARGM SD&D.

# UNCLASSIFIED

**CLASSIFICATION:**

| EXHIBIT R-2a, RDT&E Project Justification  |                                  |   | DATE:                |                    |
|--|----------------------------------|---|----------------------|--------------------|
|  |                                  |   | <b>February 2002</b> |                    |
| APPROPRIATION/BUDGET ACTIVITY  | PROGRAM ELEMENT NUMBER AND NAME  | PROJECT NUMBER AND NAME                                     |                      |                    |
| <b>RDT&amp;E, N / BA-7</b>   | <b>0205601N HARM Improvement</b> | <b>A2185 Advanced Anti-Radiation Guided Missile (AARGM)</b> |                      |                    |
| <b>(U) E. SCHEDULE PROFILE</b>   |                                  |   |                      |                    |
| The AARGM program is an Advanced Technology Program and therefore does not have a standard detailed Milestone Plan. A list of key actions appears below. |                                  |   |                      |                    |
| AARGM PROGRAM  | <u>FY 2001</u>                   | <u>FY2002</u>   | <u>FY2003</u>        | <u>To Complete</u> |
| Brassboard Captive Flight Tests (CFTs)   |                                  |   |                      |                    |
| Unique Design and CFT Preparation  |                                  |   |                      |                    |
| Contractor Managed Testing   |                                  |   |                      |                    |
| Captive Flight Testing   | Commenced 4Q/01                  | Complete 2Q/02  |                      |                    |
| Guided Test Vehicles (GTVs)  |                                  |   |                      |                    |
| Hardware/Software Design Upgrades  |                                  | Complete 2Q/02  |                      |                    |
| Subsystems Assembly and Test   |                                  | Complete 2Q/02  |                      |                    |
| Integration and Test   |                                  | Complete 2Q/02  |                      |                    |
| GTV Live Fire Test and Analysis  | Commenced 4Q/01                  | Complete 3Q/02  |                      |                    |
| Contractor Design and Trade Studies  |                                  |   |                      |                    |
| Milestone B - System Development & Demonstration (SD&D) Decision   |                                  | 4Q/02   |                      |                    |
|  |                                  | 4Q/02   |                      |                    |
| QUICK BOLT PROGRAM   |                                  |   |                      |                    |
| System Requirements Review (SRR)   | 2Q/01                            |   |                      |                    |
| System Design Review (SDR)   | 3Q/01                            |   |                      |                    |
| Military Utility Assessment  |                                  |   | 3Q/03                |                    |
| ACTD Final Report  |                                  |   | 3Q/03                |                    |
| <u>SD&amp;D</u>  |                                  |   |                      |                    |
| Integrated Baseline Review (IBR)   |                                  |   | 3Q/03                |                    |
| System Design Review (SDR)   |                                  |   | 4Q/03                |                    |
| Preliminary Design Review (PDR)  |                                  |   |                      | 1Q/04              |
| Critical Design Review (CDR)   |                                  |   |                      | 2Q/04              |
| Production Readiness Review (PRR)  |                                  |   |                      | 4Q/05              |
| Milestone C - Low Rate Initial Production (LRIP) Decision  |                                  |   |                      | 1Q/06              |

R-1 SHOPPING LIST - Item No. 186

# UNCLASSIFIED

**Exhibit R-2, RDTEN Budget Item Justification**  
(Exhibit R-2, page 14 of 21)

**UNCLASSIFIED**

**CLASSIFICATION:**

| Exhibit R-3 Cost Analysis (page 1) |                        |                                |                           |            |                  |  |                  |            |                  | DATE: <b>February 2002</b> |            |                          |
|------------------------------------|------------------------|--------------------------------|---------------------------|------------|------------------|--|------------------|------------|------------------|----------------------------|------------|--------------------------|
| APPROPRIATION/BUDGET ACTIVITY      |                        |                                | PROGRAM ELEMENT           |            |                  | PROJECT NUMBER AND NAME                              |                  |            |                  |                            |            |                          |
| <b>RDT&amp;E, N / BA-7</b>         |                        |                                | 0205601N HARM Improvement |            |                  | A2185 Advanced Anti-Radiation Guided Missile (AARGM) |                  |            |                  |                            |            |                          |
| Cost Categories                    | 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 |
| Adv Tech Dev and Risk Reduction    | CPFF                   | SAT, Woodland Hills, CA        | 95.214                    | 3.348      | 12/00            | 11.600   | 02/02            |            |                  |                            | 110.162    | 110.162                  |
| Engineering Support                | WX                     | NAWC WD, China Lake, CA        | 12.152                    | 3.459      | 10/00            | 1.160  | 02/02            | 8.710      | 10/02            | 47.760                     | 73.241     |                          |
| Engineering/Tech Assessment        | CPIF                   | JHU/APL, MD                    | 0.615                     |            |                  |  |                  |            |                  |                            | 0.615      | 0.615                    |
| Risk Reduction                     | CPFF                   | SAT, Woodland Hills, CA        | 23.805                    | 14.371     | 04/01            |  |                  |            |                  |                            | 38.176     | 38.176                   |
| Quick Bolt                         | CPFF                   | SAT, Woodland Hills, CA        |                           | 4.700      | 11/01            |  |                  | 14.000     | 12/02            |                            | 18.700     | 18.700                   |
| AARGM/QB SD&D                      | CPFF                   | SAT, Woodland Hills, CA        |                           |            |                  |  |                  | 24.000     | 12/02            | 177.000                    | 201.000    | 201.000                  |
| Subtotal Product Development       |                        |                                | 131.786                   | 25.878     |                  | 12.760   |                  | 46.710     |                  | 224.760                    | 441.894    |                          |
| Remarks:                           |                        |                                |                           |            |                  |  |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |  |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |  |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |  |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |  |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |  |                  |            |                  |                            |            |                          |
|                                    |                        |                                |                           |            |                  |  |                  |            |                  |                            |            |                          |
| Subtotal Support                   |                        |                                |                           |            |                  |  |                  |            |                  |                            |            |                          |
| Remarks:                           |                        |                                |                           |            |                  |  |                  |            |                  |                            |            |                          |

R-1 SHOPPING LIST - Item No. 186

**UNCLASSIFIED**

**UNCLASSIFIED**

CLASSIFICATION:

| Exhibit R-3 Cost Analysis (page 2) |                        |                                |                           |            |                  |  |                  | DATE: <b>February 2002</b> |                  |                  |            |                          |
|------------------------------------|------------------------|--------------------------------|---------------------------|------------|------------------|--|------------------|----------------------------|------------------|------------------|------------|--------------------------|
| APPROPRIATION/BUDGET ACTIVITY      |                        |                                | PROGRAM ELEMENT           |            |                  | PROJECT NUMBER AND NAME                              |                  |                            |                  |                  |            |                          |
| <b>RDT&amp;E, N / BA-7</b>         |                        |                                | 0205601N HARM Improvement |            |                  | A2185 Advanced Anti-Radiation Guided Missile (AARGM) |                  |                            |                  |                  |            |                          |
| Cost Categories                    | 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 |
| SD&D Test and Evaluation Support   | WX                     | NAWC WD, China Lake, CA        |                           |            |                  | 1.150  | 02/02            |                            |                  | 22.400           | 23.550     |                          |
|                                    |                        |                                |                           |            |                  |  |                  |                            |                  |                  |            |                          |
|                                    |                        |                                |                           |            |                  |  |                  |                            |                  |                  |            |                          |
| Subtotal T&E                       |                        |                                |                           |            |                  | 1.150  |                  |                            |                  | 22.400           | 23.550     |                          |
| Remarks:                           |                        |                                |                           |            |                  |  |                  |                            |                  |                  |            |                          |
| Travel                             | WX                     | NAWCAD, Patuxent, MD           | 0.280                     | 0.095      | 10/00            | 0.060  | 02/02            | 0.125                      | 10/02            | Continuing       | Continuing |                          |
| Technical Assessment/Mgmt Supp     | RX/LOE                 | DCS Alexandria, VA             | 2.468                     | 0.768      | 12/00            | 0.600  | 02/02            | 1.875                      | 11/02            | 5.000            | 10.711     | 10.711                   |
|                                    |                        |                                |                           |            |                  |  |                  |                            |                  |                  |            |                          |
|                                    |                        |                                |                           |            |                  |  |                  |                            |                  |                  |            |                          |
| Subtotal Management                |                        |                                | 2.748                     | 0.863      |                  | 0.660  |                  | 2.000                      |                  | Continuing       | Continuing |                          |
| Remarks:                           |                        |                                |                           |            |                  |  |                  |                            |                  |                  |            |                          |
| Total Cost                         |                        |                                | 134.534                   | 26.741     |                  | 14.570   |                  | 48.710                     |                  | Continuing       | Continuing |                          |
| Remarks:                           |                        |                                |                           |            |                  |  |                  |                            |                  |                  |            |                          |

# UNCLASSIFIED

**CLASSIFICATION:**

|   |  |  |         |         |         |  |         |                            |         |                  |               |
|---|--|--|---------|---------|---------|--|---------|----------------------------|---------|------------------|---------------|
| EXHIBIT R-2a, RDT&E Project Justification                   |  |  |         |         |         |  |         | DATE: <b>February 2002</b> |         |                  |               |
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N / BA-7</b> |  | PROGRAM ELEMENT NUMBER AND NAME<br>0205601N HARM Improvement |         |         |         | PROJECT NUMBER AND NAME<br>A2211 JAWS* |         |                            |         |                  |               |
| COST (\$ in Millions)                                       |  | Prior Year Cost  | FY 2001 | FY 2002 | FY 2003 | FY 2004                                | FY 2005 | FY 2006                    | FY 2007 | Cost to Complete | Total Program |
| Project Cost  |  |  | 2.774   | 1.289   | 8.147   | 14.492                                 | 6.473   | 4.158                      | 4.206   | Continuing       | Continuing    |
| RDT&E Articles Qty  |  |  |         |         |         |  |         |                            |         |                  |               |

\*Funding for FY00 was executed under Project Unit E2211 and the Joint Advanced Weapons Systems (JAWS) RDT&E line. PU A2211 will be effective beginning FY01 due to the realignment from PEO(T) to PEO(W).

(U) A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION:

Modernized Hellfire (MH) is a joint service program in participation with the Army (Common Missile) and USMC (Advanced Precision Kill Weapon System (APKWS)) in support of an approved Mission Need Statements for future multi-role precision guided weapons. Navy MH efforts support joint System Definition and Risk Reduction efforts, Advanced Technology Demonstrations, modeling, simulation and hardware component development efforts, requirements validation and Analysis of Alternatives, aircraft integration efforts, and the development of Milestone support documentation. The Army is the lead service for these efforts, and Memorandums of Understanding establish the services responsibilities for the Concept Exploration phases. The MH efforts support the Department of the Navy's requirements for state-of-the-art weapon capabilities to complement the next generation of aircraft and to best defeat the threats of the next generation battlefield.

(U) PROGRAM ACCOMPLISHMENTS AND PLANS:

1. FY 2001 ACCOMPLISHMENTS:

-(U) (\$2.774) Formal validation of proposed requirements for the MH completed in Sep 2001. Efforts included rotary and fixed wing evaluation using Man-in-the-Loop modeling and simulation facilities at the APEX Lab and at NAWC-WD. Effort established requirements for the draft MH Joint Operational Requirements Document (ORD). Participated with the Army in their studies related to the Joint Common Missile (JCM). Continued evaluation of potential component technical solutions for future weapons via joint modeling and hardware development efforts. (\$.924 Army and \$1.850 government in-house).

2. FY 2002 PLAN:

-(U) (\$1.289) Initiate the formal AOA to recommend a material solution to satisfy the MNS for MH. Evaluate potential component technical solutions for future weapons via joint modeling and hardware development efforts. Participate with the Army in their studies related to the JCM. Participate with the Army on development, integration, and testing efforts for the APKWS. (\$.085 Army , \$1.165 government in-house and \$.039 for SBIR assessment.)

# UNCLASSIFIED

**CLASSIFICATION:**

|  |   |  |
|--|---|--|
| EXHIBIT R-2a, RDT&E Project Justification  |   | DATE:<br><b>February 2002</b>                |
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N / BA-7</b>  | PROGRAM ELEMENT NUMBER AND NAME<br><b>0205601N HARM Improvement</b> | PROJECT NUMBER AND NAME<br><b>A2211 JAWS</b> |
| <p>3. FY 2003 PLAN:</p> <p>-(U) (\$8.147) Explore component technical solutions for the Modernized Hellfire missile via modeling, simulation, systems integration and hardware development efforts. Participate with the U.S. Army in their studies related to the Joint Common Missile.</p> |   |  |

R-1 SHOPPING LIST - Item No. 186

**UNCLASSIFIED**

**Exhibit R-2, RDTE Budget Item Justification**  
(Exhibit R-2, page 18 of 21)

# UNCLASSIFIED

**CLASSIFICATION:**

|   |                                  |                         |        |                      |
|---|----------------------------------|-------------------------|--------|----------------------|
| EXHIBIT R-2a, RDT&E Project Justification   |                                  |                         | DATE:  | <b>February 2002</b> |
| APPROPRIATION/BUDGET ACTIVITY   | PROGRAM ELEMENT NUMBER AND NAME  | PROJECT NUMBER AND NAME |        |                      |
| <b>RDT&amp;E, N / BA-7</b>  | <b>0205601N HARM Improvement</b> | <b>A2211 JAWS</b>       |        |                      |
| (U) B. PROGRAM CHANGE SUMMARY:  |                                  |                         |        |                      |
|   | FY2001                           | FY2002                  | FY2003 |                      |
| (U) FY 2002 President's Budget:   | 2.324                            | 1.300                   |        |                      |
| (U) Adjustments from the President's Budget:  | 0.450                            | -0.011                  |        |                      |
| (U) FY 2003 DoN Budget Submit:  | 2.774                            | 1.289                   | 8.147  |                      |
| CHANGE SUMMARY EXPLANATION:   |                                  |                         |        |                      |
| (U) Funding: The FY 2001 net increase of \$.450 million reflects an increase of \$.553 million for a restoral of JAWS funds offset by a \$.093 million SBIR assessment and a decrease of \$.010 for a reprioritization of requirements within the Navy. The FY 2002 decrease of \$.011 is for an undistributed congressional reduction. |                                  |                         |        |                      |
| (U) Schedule: Not applicable.   |                                  |                         |        |                      |
| (U) Technical: Not applicable.  |                                  |                         |        |                      |
| (U) C. OTHER PROGRAM FUNDING SUMMARY:   |                                  |                         |        |                      |
| Related RDT&E: U. S. Army P.E. 0603313A PROJ D263 Future Missile Technology Insertion (FMTI). U.S. Army P.E. 0604329A Common Missile, U.S. Army P.E. 0604802A Advanced Precision Kill Weapon System.  |                                  |                         |        |                      |
| (U) D. ACQUISITION STRATEGY: Not an ACAT program with no specific acquisition strategy.   |                                  |                         |        |                      |
| (U) E. SCHEDULE PROFILE: Not applicable.  |                                  |                         |        |                      |
| Related RDT&E: U. S. Army P.E. 0603313A PROJ D263 Future Missile Technology Insertion (FMTI).   |                                  |                         |        |                      |

R-1 SHOPPING LIST - Item No. 186

**UNCLASSIFIED**

**Exhibit R-2, RDTEN Budget Item Justification**  
(Exhibit R-2, page 19 of 21)

**UNCLASSIFIED**

**CLASSIFICATION:**

| Exhibit R-3 Cost Analysis (page 1)                          |                        |                                |  |            |                  |            |                                       |            |                  | DATE: <b>February 2002</b> |            |                          |
|---|------------------------|--------------------------------|--|------------|------------------|------------|---------------------------------------|------------|------------------|----------------------------|------------|--------------------------|
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N / BA-7</b> |                        |                                | PROGRAM ELEMENT<br>0205601N HARM Improvement |            |                  |            | PROJECT NUMBER AND NAME<br>A2211 JAWS |            |                  |                            |            |                          |
| Cost Categories   | 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 |
| APEX Lab  | MIPR                   | AAMCOM, Huntsville, AL         | 0.450  | 0.739      | 12/00            | 0.085      | 12/01                                 | 6.124      | 12/02            |                            | 7.398      |                          |
| Tech evaluation & Development                               | MIPR                   | TRADOC Norfolk, VA             |  | 0.185      | 12/00            |            |                                       |            |                  |                            | 0.185      |                          |
| APKWS   | MIPR                   |                                | 0.100  |            |                  |            |                                       |            |                  |                            | 0.100      |                          |
|   |                        |                                |  |            |                  |            |                                       |            |                  |                            |            |                          |
|   |                        |                                |  |            |                  |            |                                       |            |                  |                            |            |                          |
|   |                        |                                |  |            |                  |            |                                       |            |                  |                            |            |                          |
| Subtotal Product Development                                |                        |                                | 0.550  | 0.924      |                  | 0.085      |                                       | 6.124      |                  |                            | 7.683      |                          |
| Remarks:  |                        |                                |  |            |                  |            |                                       |            |                  |                            |            |                          |
| Engineering Technical Services                              | C/TMM                  | DCS Corp, Alexandria VA        | 0.110  | 0.215      | 01/01            | 0.160      | 01/02                                 | 0.421      | 01/03            |                            | 0.906      | 0.906                    |
| Engineering Technical Services                              | C/TMM                  | Whitney, Bradley and Brown     | 0.150  | 0.363      | 01/01            | 0.240      | 01/02                                 |            |                  |                            | 0.753      | 0.753                    |
|   |                        |                                |  |            |                  |            |                                       |            |                  |                            |            |                          |
|   |                        |                                |  |            |                  |            |                                       |            |                  |                            |            |                          |
|   |                        |                                |  |            |                  |            |                                       |            |                  |                            |            |                          |
| Subtotal Support  |                        |                                | 0.260  | 0.578      |                  | 0.400      |                                       | 0.421      |                  |                            | 1.659      |                          |
| Remarks:  |                        |                                |  |            |                  |            |                                       |            |                  |                            |            |                          |

R-1 SHOPPING LIST - Item No.186

**UNCLASSIFIED**

**UNCLASSIFIED**

**CLASSIFICATION:**

| Exhibit R-3 Cost Analysis (page 2)                          |                        |                                |                             |            |                  |                                       |                  |            |                  | DATE: <b>February 2002</b> |            |                          |
|---|------------------------|--------------------------------|-----------------------------|------------|------------------|---------------------------------------|------------------|------------|------------------|----------------------------|------------|--------------------------|
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N / BA-7</b> |                        |                                | PROGRAM ELEMENT<br>0205601N |            |                  | PROJECT NUMBER AND NAME<br>A2211 JAWS |                  |            |                  |                            |            |                          |
| Cost Categories   | 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 |
| Testing   | WX                     | NAWC WD, China Lake, CA        |                             | 1.190      | 11/00            | 0.722                                 | 11/01            | 1.566      | 11/02            | Continuing                 | Continuing |                          |
| SBIR Assessment   |                        |                                |                             |            |                  | 0.039                                 |                  |            |                  |                            | 0.039      |                          |
| Subtotal T&E  |                        |                                |                             | 1.190      |                  | 0.761                                 |                  | 1.566      |                  | Continuing                 | Continuing |                          |
| Remarks:  |                        |                                |                             |            |                  |                                       |                  |            |                  |                            |            |                          |
| Travel  | WX                     | NAWC AD, Patuxent River        |                             | 0.072      | 11/00            | 0.033                                 | 11/01            | 0.031      | 11/02            | Continuing                 | Continuing |                          |
| Travel  | MIPR                   | AAMCOM, Huntsville, AL         |                             | 0.010      | 11/00            | 0.010                                 | 11/01            | 0.005      | 11/02            | Continuing                 | Continuing |                          |
|   |                        |                                |                             |            |                  |                                       |                  |            |                  |                            |            |                          |
|   |                        |                                |                             |            |                  |                                       |                  |            |                  |                            |            |                          |
| Subtotal Management   |                        |                                |                             | 0.082      |                  | 0.043                                 |                  | 0.036      |                  | Continuing                 | Continuing |                          |
| Remarks:  |                        |                                |                             |            |                  |                                       |                  |            |                  |                            |            |                          |
| Total Cost  |                        |                                | 0.810                       | 2.774      |                  | 1.289                                 |                  | 8.147      |                  | Continuing                 | Continuing |                          |
| Remarks:  |                        |                                |                             |            |                  |                                       |                  |            |                  |                            |            |                          |

R-1 SHOPPING LIST - Item No. 186

**UNCLASSIFIED**