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| EXHIBIT R-2, RDT&E Budget Item Justification                   |  |         |         |         |                           |         | DATE: <b>February 2000</b> |         |                  |            |
|--|--|---------|---------|---------|---------------------------|---------|----------------------------|---------|------------------|------------|
| APPROPRIATION/BUDGET ACTIVITY                                  |  |         |         |         | R-1 ITEM NOMENCLATURE     |         |                            |         |                  |            |
| <b>RESEARCH, DEVELOPMENT, TEST &amp; EVALUATION, NAVY/BA 5</b> |  |         |         |         | Mine Development/0604601N |         |                            |         |                  |            |
| COST (\$ in Million:   |  | FY 1999 | FY 2000 | FY 2001 | FY 2002                   | FY 2003 | FY 2004                    | FY 2005 | Cost to Complete | Total Cost |
| Total PE Cost  |  | 0.015   | 3.297   | 1.968   | 3.019                     | 5.939   | 0.000                      | 0.000   | CONT.            | CONT.      |
| Mine Improvement Q0267'  |  | 0.015   | 3.297   | 1.968   | 3.019                     | 5.939   | 0.000                      | 0.000   | CONT.            | CONT.      |
| Quantity of RDT&E Articles                                     |  | N/A     | N/A     | 18**    | N/A                       | N/A     | N/A                        | N/A     |                  |            |

\* The above controls reflect USN dollars only. Additional ISLMM program dollars will be provided from the Royal Australian Navy (RAN) (see Section C - Other Program Funding Summary).

\*\* 18 Engineering Development Models (EDMs) will be procured in support of the Engineering and Manufacturing Development (EMD) phase.

A. Mission Description and Budget Item Justification  
 (U) This project is the only R&D program for mine systems, and is the sole support for the capability to maintain the effectiveness of mines facing new threat targets and increasing emphasis on major regional conflicts and littoral warfare in shallow water. Project tasks are grouped into several areas: (1a) Threat Modeling/Analysis, which collects, analyzes, and develops digital models of data on current priority threat target characteristics to support computer simulations; (1b) Target Detection and Response, which uses target models to develop optimal mine designs, settings, and firing algorithms; (2a) Components/Subsystems, which develops upgrades of mine components to maintain effectiveness against current threat targets using proven state-of-the-art technology including a remote controlled mine capability (RECO); (2b) Advanced Power sources, which develops improved batteries without hazardous heavy metals, and (3) New mines, which designs and develops new mines, including an Improved Submarine-Launched Mobile Mine (ISLMM). Efforts under (1) and (2) are Non-ACAT; the Improved Submarine-Launched Mobile Mine is an ACAT III, International Cooperative R&D program with the RAN. The Mission Need Statement (MNS M044-85-93) for an Improved Submarine-Launched Mobile Mine (ISLMM) was approved on 13 December 1993. The MNS shows a Fleet need to have a covert mining capability and to eliminate reliability problems associated with the existing MK 67 SLMM. The ISLMM will be used to sustain and improve the USN covert mining capability by converting existing MK48 Torpedoes into dual warhead mines. It will feature dual mine sections and utilize the advanced Target Detection Device (TDD) MK71. The ISLMM will be designed for launch from the following platforms:

- \* SSN 688 Class Submarines
- \* Seawolf Class Submarines
- \* Virginia Class Submarines
- \* Collins Class Submarines (RAN)

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**Exhibit R-2, RDT&E Budget Item Justification**  
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| EXHIBIT R-2, RDT&E Budget Item Justification  |  | DATE:<br><b>February 2000</b> |
| APPROPRIATION/BUDGET ACTIVITY<br><b>RESEARCH, DEVELOPMENT, TEST &amp; EVALUATION, NAVY/BA 5</b>   | R-1 ITEM NOMENCLATURE<br>Mine Development/0604601N |                               |
| <p>(U) PROGRAM ACCOMPLISHMENTS AND PLANS:</p> <p>1. (U) FY 1999 ACCOMPLISHMENTS:</p> <ul style="list-style-type: none"><li>- (U) (\$.015) Program Management</li></ul> <p>2. (U) FY 2000 PLAN:</p> <ul style="list-style-type: none"><li>- (U) (\$.797) Initiate design and development of a remote controlled mine (RECO) capability, including signal reception sensors, confirmation signal transmitters, and computerized tactical aids.</li><li>- (U) (\$1.865) Initiate design and development of the MK48-based Improved Submarine-Launched Mobile Mine (ISLMM) EDMs, to include: Design the TDD interface, an exercise configuration, control group modifications, and identify noise levels. Integrate a commercial off the shelf (COTS) control group computer. Integrate electronic compass into the control section. Design a separation section for release of forward payload. Perform production readiness review on TDD Mk 71. Test and evaluate EDM components.</li><li>- (U) (\$.057) Initiate Tactical Software Development for ISLMM.</li><li>- (U) (\$.361) Initiate ISLMM test program development.</li><li>- (U) (\$.217) Initiate Integrated Logistics Support (ILS) tasks for ISLMM related to maintainability, reliability and sustainability.</li></ul> <p>3. (U) FY 2001 PLAN:</p> <ul style="list-style-type: none"><li>- (U) (\$.968) Complete design and development of a remote controlled mine (RECO) capability, including signal reception sensors, confirmation signal transmitters, and computerized tactical aids.</li><li>- (U) (\$.750) Continue design and development, and initiate fabrication of ISLMM EDMs and continue Systems Engineering tasks.</li><li>- (U) (\$.100) Continue development of ISLMM Tactical Software.</li><li>- (U) (\$.100) Initiate ISLMM Engineering and Shock testing.</li><li>- (U) (\$.050) Continue ISLMM ILS efforts.</li></ul> |  |                               |

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| EXHIBIT R-2, RDT&E Budget Item Justification  |   |                |                |                |                |                | DATE:<br><b>February 2000</b>                      |                |                    |                   |
| APPROPRIATION/BUDGET ACTIVITY<br><b>RESEARCH, DEVELOPMENT, TEST &amp; EVALUATION, NAVY/BA 5</b>   |   |                |                |                |                |                | R-1 ITEM NOMENCLATURE<br>Mine Development/0604601N |                |                    |                   |
| B. Program Change Summary:  |   |                |                |                |                |                |  |                |                    |                   |
|   |   | FY 1999        | FY 2000        | FY 2001        |                |                |  |                |                    |                   |
|   | FY 2000 President's Budget:   | 0.015          | 3.315          | 5.891          |                |                |  |                |                    |                   |
|   | Appropriated Value:   | 0.015          | 3.315          |                |                |                |  |                |                    |                   |
|   | Adjustment to FY 1999/2000 Appropriated Value/<br>FY 2000 President's Budget: |                | -0.018         | (3.923)        |                |                |  |                |                    |                   |
|   | FY 2001 OSD/OMB Budget Submit:  | 0.015          | 3.297          | 1.968          |                |                |  |                |                    |                   |
| Funding: FY 2000 decrease due to general undistributed reductions (-\$0.018M) FY 2001net decrease reflects termination of Littoral Sea Mine (-\$1.000M), decrease for higher priority requirements (-\$2,923).  |   |                |                |                |                |                |  |                |                    |                   |
| C. Other Program Funding Summary : (\$ in Millions)   |   |                |                |                |                |                |  |                |                    |                   |
|   | <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> |
| ISLMM   | 0.000   | 0.000          | 0.000          | 0.000          | 0.000          | 3.762          | 9.566  | 0.000          | 0.000              | 13.328            |
| WPN BLI 322100  |   |                |                |                |                |                |  |                |                    |                   |
| Related RDT&E:  |   |                |                |                |                |                |  |                |                    |                   |
| Royal Australian Navy   | 0.000   | 0.000          | 0.000          | 8.000          | 4.500          | 0.000          | 0.000  | 0.000          | 0.000              | 12.500            |
| D. Acquisition Strategy:  |   |                |                |                |                |                |  |                |                    |                   |
| The USN and RAN will cooperatively design ISLMM. The US Navy will contract with qualified contractors to manufacture the components for the kits to make the EDMs. NUWC Keyport, the USN depot for the MK48, will assemble the ISLMMs/EDMs for All up Round (AUR) testing.<br>Using existing hardware to the greatest extent possible, NSWC CSS Panama City FLwill team with other Navy laboratories and hardware contractors to design and develop the RECO. |   |                |                |                |                |                |  |                |                    |                   |

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EXHIBIT R-2, RDT&E Budget Item Justification

DATE:

**February 2000**

APPROPRIATION/BUDGET ACTIVITY

**RESEARCH, DEVELOPMENT, TEST & EVALUATION, NAVY/BA 5**

R-1 ITEM NOMENCLATURE

Mine Development/0604601N

E. Schedule Profile

**IMPROVED SLMM PROGRAM SCHEDULE**

|                                      | FY99 | FY00         | FY01    | FY02       | FY03    | FY04 | FY05 |
|--------------------------------------|------|--------------|---------|------------|---------|------|------|
| <b>MAJOR PROGRAM DECISION POINTS</b> |      | SRR Δ MSII Δ | Δ PDR   | CDR Δ PR Δ | MSIII Δ |      |      |
| <b>EMD PHASE</b>                     |      |              |         |            |         |      |      |
| Design/Development                   |      | Δ            | —————   | Δ          |         |      |      |
| Build EDMs                           |      |              | Δ ——— Δ |            |         |      |      |
| Engineering Testing                  |      |              | Δ ——— Δ |            |         |      |      |
| In-water Tests                       |      |              |         | Δ Δ        |         |      |      |
| DT/OT                                |      |              |         | Δ ——— Δ    |         |      |      |
| OPEVAL                               |      |              |         |            | Δ Δ     |      |      |
| <b>PROCUREMENT PHASE</b>             |      |              |         |            |         |      |      |
| LRIP                                 |      |              |         |            | Δ ——— Δ |      |      |
| IOC                                  |      |              |         |            |         | Δ    |      |

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**Exhibit R-2, RDT&E Budget Item Justification**

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| Exhibit R-3 Cost Analysis (page 1)   |                              |  |                                 |               |                        |                         |                        |               |                        | DATE: February 2000 |               |                             |
|--|------------------------------|--|---------------------------------|---------------|------------------------|-------------------------|------------------------|---------------|------------------------|---------------------|---------------|-----------------------------|
| APPROPRIATION/BUDGET ACTIVITY  |                              |  | PROGRAM ELEMENT NAME AND NUMBER |               |                        | PROJECT NAME AND NUMBER |                        |               |                        |                     |               |                             |
| RDT&E, N/BA-5  |                              |  | MINE DEVELOPMENT/0604601N       |               |                        | MINE DEVELOPMENT/Q0267  |                        |               |                        |                     |               |                             |
| Cost Categories<br>(Tailor to WBS, or System/Item<br>Requirements)   | Contract<br>Method<br>& Type | Performing<br>Activity &<br>Location                                 | Total<br>PY s<br>Cost           | FY 99<br>Cost | FY 99<br>Award<br>Date | FY 00<br>Cost           | FY 00<br>Award<br>Date | FY 01<br>Cost | FY 01<br>Award<br>Date | Cost to<br>Complete | Total<br>Cost | Target Value<br>of Contract |
| Primary Hardware Development   | RCP                          | NUWC DIVN<br>PT -<br>Newport, RI<br>NUWC DIVKP<br>T -<br>Keyport, WA | 105.585                         | 0.000         | N/A                    | 0.908                   | N/A                    | 0.853         | 10/00                  | CONT.               | CONT.         |                             |
| Ancillary Hardware Development   |                              |  | 2.158                           |               |                        |                         |                        |               |                        |                     | 2.158         |                             |
| Systems Engineering  | WR                           | NUWC DIVN<br>PT -<br>Newport, RI<br>NUWC DIVKP<br>T -<br>Keyport, WA | 0.000                           | 0.000         | N/A                    | 1.057                   | N/A                    | 0.193         | 10/00                  | CONT.               | CONT.         |                             |
| Licenses   |                              |  |                                 |               |                        |                         |                        |               |                        |                     | 0.000         |                             |
| Tooling  |                              |  |                                 |               |                        |                         |                        |               |                        |                     | 0.000         |                             |
| GFE  |                              |  |                                 |               |                        |                         |                        |               |                        |                     | 0.000         |                             |
| Award Fees   |                              |  | 4.790                           |               |                        |                         |                        |               |                        | 0.000               | 4.790         |                             |
| Subtotal Product Development   |                              |  | 112.533                         | 0.000         |                        | 1.965                   |                        | 1.046         |                        | CONT.               | CONT.         |                             |
| Remarks:<br>18 Engineering Development Models (EDMs) will be procured in support of the Engineering and Manufacturing Development (EMD) phase. |                              |  |                                 |               |                        |                         |                        |               |                        |                     |               |                             |
| Development Support Equipment  |                              |  |                                 |               |                        |                         |                        |               |                        |                     |               |                             |
| Software Development   | WR                           | NUWC DIVN<br>PT -<br>Newport, RI                                     | 2.307                           | 0.000         | N/A                    | 0.347                   | 10/99                  | 0.373         | 10/00                  | CONT.               | CONT.         | N/A                         |
| Training Development   |                              |  |                                 |               |                        |                         |                        |               |                        |                     | 0.000         |                             |
| Integrated Logistics Support   | WR                           | NUWC DIVN<br>PT -<br>Newport, RI<br>NUWC DIVKP<br>T -<br>Keyport, WA | 0.000                           | 0.000         | N/A                    | 0.208                   | 10/99                  | 0.037         | 10/00                  | CONT.               | CONT.         | N/A                         |
| Configuration Management   |                              |  |                                 |               |                        |                         |                        |               |                        |                     | 0.000         |                             |
| Technical Data   |                              |  |                                 |               |                        |                         |                        |               |                        |                     | 0.000         |                             |
| GFE  |                              |  |                                 |               |                        |                         |                        |               |                        |                     | 0.000         |                             |
| Subtotal Support   |                              |  | 2.307                           | 0.000         |                        | 0.555                   |                        | 0.410         |                        | CONT.               | CONT.         | N/A                         |
| Remarks:   |                              |  |                                 |               |                        |                         |                        |               |                        |                     |               |                             |

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Exhibit R-3, Project Cost Analysis  
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| Exhibit R-3 Cost Analysis (page 2)                                 |                              |  |                                  |               |                        |                               |                        | DATE: <b>February 2000</b> |                        |                     |               |                             |
|--|------------------------------|--|----------------------------------|---------------|------------------------|-------------------------------|------------------------|----------------------------|------------------------|---------------------|---------------|-----------------------------|
| APPROPRIATION/BUDGET ACTIVITY                                      |                              |  | PROGRAM ELEMENT                  |               |                        | PROJECT NAME AND NUMBER       |                        |                            |                        |                     |               |                             |
| <b>RDT&amp;E, N/BA-5</b>   |                              |  | <b>MINE DEVELOPMENT/0604601N</b> |               |                        | <b>MINE DEVELOPMENT/Q0267</b> |                        |                            |                        |                     |               |                             |
| Cost Categories<br>(Tailor to WBS, or System/Item<br>Requirements) | Contract<br>Method<br>& Type | Performing<br>Activity &<br>Location                               | Total<br>PY s<br>Cost            | FY 99<br>Cost | FY 99<br>Award<br>Date | FY 00<br>Cost                 | FY 00<br>Award<br>Date | FY 01<br>Cost              | FY 01<br>Award<br>Date | Cost to<br>Complete | Total<br>Cost | Target Value<br>of Contract |
| Developmental Test & Evaluation                                    | WR                           | NUWCDIVNP<br>T -<br>Newport, RI<br>NUWCDIVKP<br>T -<br>Keyport, WA | 15.386                           | 0.000         | N/A                    | 0.327                         | N/A                    | 0.120                      | 10/00                  | CONT.               | CONT.         | N/A                         |
| Operational Test & Evaluation                                      |                              |  |                                  |               |                        |                               |                        |                            |                        |                     |               |                             |
| Tooling  |                              |  |                                  |               |                        |                               |                        |                            |                        |                     |               |                             |
| GFE  |                              |  |                                  |               |                        |                               |                        |                            |                        |                     |               |                             |
| Subtotal T&E   |                              |  | 15.386                           | 0.000         |                        | 0.327                         |                        | 0.120                      |                        | 0.000               | 15.833        | N/A                         |
| Remarks:   |                              |  |                                  |               |                        |                               |                        |                            |                        |                     |               |                             |
| Contractor Engineering Support                                     |                              |  |                                  |               |                        |                               |                        |                            |                        |                     |               |                             |
| Government Engineering Support                                     |                              |  | 35.599                           |               |                        |                               |                        |                            |                        |                     | 35.599        |                             |
| Program Management Support   | WR                           | VARIOUS  | 0.000                            | 0.015         | MISC.                  | 0.450                         | MISC.                  | 0.392                      | MISC.                  | CONT.               | CONT.         | N/A                         |
| Travel   |                              |  |                                  |               |                        |                               |                        |                            |                        |                     |               |                             |
| Labor (Research Personnel)   |                              |  |                                  |               |                        |                               |                        |                            |                        |                     |               |                             |
| Overhead   |                              |  |                                  |               |                        |                               |                        |                            |                        |                     |               |                             |
| Subtotal Management  |                              |  | 35.599                           | 0.015         |                        | 0.450                         |                        | 0.392                      |                        | CONT.               | CONT.         | N/A                         |
| Remarks:   |                              |  |                                  |               |                        |                               |                        |                            |                        |                     |               |                             |
| Total Cost   |                              |  | 165.825                          | 0.015         |                        | 3.297                         |                        | 1.968                      |                        | CONT.               | CONT.         |                             |
| Remarks:   |                              |  |                                  |               |                        |                               |                        |                            |                        |                     |               |                             |

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**Exhibit R-3, Project Cost Analysis**  
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