

CLASSIFICATION:

**UNCLASSIFIED**

| 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>  |         |         |         | VIRGINIA Class Design Development/0604558N |         |         |                            |                  |            |
| 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   | 226.835 | 247.982 | 207.091 | 160.879                                    | 152.228 | 147.477 | 155.348                    | 136.800          | 2861.545   |
| VIRGINIA Class HM&E Development/F1947   | 137.835 | 165.356 | 133.857 | 100.118                                    | 94.971  | 101.146 | 110.954                    | 102.500          | 1905.519   |
| VIRGINIA Class Combat Systems Dev/F1950   | 72.546  | 74.670  | 73.234  | 60.761                                     | 57.257  | 46.331  | 44.394                     | 34.300           | 920.299    |
| Enhanced Sonar Dome Demo/Validation/F2429   | 6.776   | 0.000   | 0.000   | 0.000                                      | 0.000   | 0.000   | 0.000                      | 0.000            | 10.548     |
| Adv Sub Tactical Electronic Sys/Int. Mast/F2430   | 0.000   | 0.000   | 0.000   | 0.000                                      | 0.000   | 0.000   | 0.000                      | 0.000            | 7.545      |
| VIRGINIA Class Advance Tech Insertion/F2644   | 4.839   | 0.000   | 0.000   | 0.000                                      | 0.000   | 0.000   | 0.000                      | 0.000            | 4.839      |
| NON-Propulsion Electronics System/F2645   | 4.839   | 7.956   | 0.000   | 0.000                                      | 0.000   | 0.000   | 0.000                      | 0.000            | 12.795     |
| Quantity of RDT&E Articles  |         |         |         |  |         |         |                            |                  |            |
| <p>A. (U) Mission Description and Budget Item Justification: The U.S. Navy must maintain a submarine fleet that is of sufficient capability and numbers to defend American interests. The VIRGINIA Class Submarine formerly the New Attack Submarine (New SSN) is being designed to fulfill this need. It will counter the potential threats of the next century in a multi mission capable submarine that has the ability to provide covert, sustained combat presence in denied waters. The primary goal of the program is to develop an affordable yet capable submarine by evaluating a broad range of system and technology alternatives, and pursuing cost reduction, producibility improvement, and technical risk management. This Program Element (PE) provides the technology, prototype components, and systems engineering needed to design and construct the VIRGINIA Class Submarine and build and its Command, Control, Communications, and Intelligence (C3I) System. This PE directly supports the following VIRGINIA Class Submarine missions: (1) covert strike warfare; (2) anti submarine warfare; (3) covert intelligence collection/surveillance, indication and warning, and electronic warfare; (4) anti-surface ship warfare; (5) special warfare; (6) mine warfare; and (7) battle group support.</p> <p>(U) Project F2429: Plus up continues a FY97 special congressional interest item that includes B.F. Goodrich, Electric Boat and Naval Surface Weapons Center as participants. The line funds investigation into new manufacturing processes for a submarine bow SONAR dome.</p> <p>(U) Project F2430: The congressional plus-up for Advance Submarine Tactical Electronic Combat System (ASTECS) and Integrated Electronic Support (ES) Measures Mast (IEM) restored several highly desirable elements of the ASTECS/IEM programs to improve platform performance. These items were eliminated due to fiscal constraints. Improvements included enhancements to ship's radar intercept, emitter identification, and signal intercept capabilities.</p> |         |         |         |  |         |         |                            |                  |            |

R-1 SHOPPING LIST - Item No. 108

Exhibit R-2, RDT&E Budget Item Justification  
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| EXHIBIT R-2, RDT&E Budget Item Justification   |   | DATE: <b>FEBRUARY 2000</b> |         |  |         |         |         |                             |         |         |         |                     |         |         |  |  |        |        |       |                             |  |  |  |                                    |         |         |         |
|--|---|----------------------------|---------|--|---------|---------|---------|-----------------------------|---------|---------|---------|---------------------|---------|---------|--|--|--------|--------|-------|-----------------------------|--|--|--|------------------------------------|---------|---------|---------|
| APPROPRIATION/BUDGET ACTIVITY<br><b>RESEARCH DEVELOPMENT TEST &amp; EVALUATION, NAVY/BA-5</b>  | R-1 ITEM NOMENCLATURE<br>VIRGINIA Class Design Development/0604558N |                            |         |  |         |         |         |                             |         |         |         |                     |         |         |  |  |        |        |       |                             |  |  |  |                                    |         |         |         |
| <p>(U) Project F2644: The Congressional Plus-Up provided additional funding to insert new technologies on the VIRGINIA Class Submarine. With these funds, three technology insertions were initiated for VIRGINIA Class Submarine specific development: High Frequency Remote Ahead Profiling; Total Ship Monitoring System (TSMS) Improvements; and Advanced Sail.</p> <p>(U) Project F2645: The congressional plus-up is for VIRGINIA Class Submarine Non-Propulsion Electronics System (NPES) inter-system engineering and integration efforts.</p> <p>R-1 (U) Program Change Summary</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 45%;"></th> <th style="width: 15%;">FY 1999</th> <th style="width: 15%;">FY 2000</th> <th style="width: 25%;">FY 2001</th> </tr> </thead> <tbody> <tr> <td>FY 2000 President's Budget:</td> <td style="text-align: right;">230.336</td> <td style="text-align: right;">241.456</td> <td style="text-align: right;">204.078</td> </tr> <tr> <td>Appropriated Value:</td> <td style="text-align: right;">235.816</td> <td style="text-align: right;">249.456</td> <td></td> </tr> <tr> <td>Adjustment to FY 1999/2000 Appropriated Value/</td> <td style="text-align: right;">-8.981</td> <td style="text-align: right;">-1.474</td> <td style="text-align: right;">3.013</td> </tr> <tr> <td>FY 2000 President's Budget:</td> <td></td> <td></td> <td></td> </tr> <tr> <td>FY 2001 President's Budget Submit:</td> <td style="text-align: right;">226.835</td> <td style="text-align: right;">247.982</td> <td style="text-align: right;">207.091</td> </tr> </tbody> </table> <p>(U) Change Summary Explanation:</p> <p>(U) F1947 Funding: The FY1999 decrease of (\$-8.525) is attributed to an increase of (\$0.243M) for April Below Threshold Reprogramming (BTR) and decreases of (-\$1.499M) for Undistributed Adjustments, (-\$2.796M) for Contract Advisory and Assistance Services (CAAS), (-\$2.973M) for Small Business Innovative Research (SBIR), and minor program adjustments (-\$1.500M).</p> <p>The FY2000 decrease of (-\$0.987M) is attributed to an increase of (\$0.291M) for Restoration issue 62288 for Outsourcing and decreases of (-\$.360M) for SSP (contracts) and (-\$.918M) for Undistributed Adjustments. \$4.715M portion of the extramural program is reserved for SBIR IAW 15 USC 638.</p> <p>The FY2001 decrease of (-\$0.356M) is attributed to increase of (\$1.675M) for Restoration of Outsourcing, (\$0.878M) NWCF rates (\$0.88M) for Undistributed Adjustments and decreases of (-\$0.782M) for VIRGINIA Class Technical Insertion Support, (-\$0.950M) for SSP (contracts), and (-\$1.265M) for minor program reductions.</p> <p>(U) F1950 Funding: The FY1999 increase of (\$0.090M) is attributed to minor program increases of (\$4.403M). Also ascribed to the FY 1999 increase are decreases of (-\$0.727M) for Undistributed Adjustments, (-\$1.990M) for CAAS and (-\$1.596M) for SBIR. The FY2000 decrease of (\$0.443M) is attributed to</p> |   |                            |         |  | FY 1999 | FY 2000 | FY 2001 | FY 2000 President's Budget: | 230.336 | 241.456 | 204.078 | Appropriated Value: | 235.816 | 249.456 |  | Adjustment to FY 1999/2000 Appropriated Value/ | -8.981 | -1.474 | 3.013 | FY 2000 President's Budget: |  |  |  | FY 2001 President's Budget Submit: | 226.835 | 247.982 | 207.091 |
|  | FY 1999   | FY 2000                    | FY 2001 |  |         |         |         |                             |         |         |         |                     |         |         |  |  |        |        |       |                             |  |  |  |                                    |         |         |         |
| FY 2000 President's Budget:  | 230.336   | 241.456                    | 204.078 |  |         |         |         |                             |         |         |         |                     |         |         |  |  |        |        |       |                             |  |  |  |                                    |         |         |         |
| Appropriated Value:  | 235.816   | 249.456                    |         |  |         |         |         |                             |         |         |         |                     |         |         |  |  |        |        |       |                             |  |  |  |                                    |         |         |         |
| Adjustment to FY 1999/2000 Appropriated Value/   | -8.981  | -1.474                     | 3.013   |  |         |         |         |                             |         |         |         |                     |         |         |  |  |        |        |       |                             |  |  |  |                                    |         |         |         |
| FY 2000 President's Budget:  |   |                            |         |  |         |         |         |                             |         |         |         |                     |         |         |  |  |        |        |       |                             |  |  |  |                                    |         |         |         |
| FY 2001 President's Budget Submit:   | 226.835   | 247.982                    | 207.091 |  |         |         |         |                             |         |         |         |                     |         |         |  |  |        |        |       |                             |  |  |  |                                    |         |         |         |

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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>VIRGINIA Class Design Development/0604558N |                               |
| <p>an increase of (\$0.122M) for Outsourcing and decreases of (-\$0.151M) for SSP (contracts) and (-\$0.414M) for Undistributed Adjustments. The FY2001 increase of (\$3.369M) is attributed to increases of (\$0.782M) for VIRGINIA Class Technical Insertion Support, (\$2.400M) for Corrected Acquisition Stability, (\$0.590M) for NWCF rates and (\$0.832M) for Outsourcing and decreases of (-\$0.472M) for SSP (contracts), (-\$0.072M) Undistributed Adjustments, and minor program adjustments of (-\$0.691M) for inflation.</p> <p>(U) F2429 Funding: The FY 1999 decrease of (-\$0.224M) is attributed to (-\$0.048M) for Undistributed Adjustments and (-\$0.176M) for SBIR.<br/>(U) F2644 Funding: The FY 1999 decrease of (-\$0.161M) is attributed to (-\$0.025M) for Undistributed Adjustments and (-\$0.126M) for SBIR.<br/>(U) F2645 Funding: The FY 1999 decrease of (-\$0.161M) is attributed to (-\$0.025M) for Undistributed Adjustments and (-\$0.126M) for SBIR. The FY2000 decrease of (-\$0.044M) is attributed to Undistributed Adjustments.</p> <p>(U) Schedule: Not applicable.<br/>(U) Technical: Not applicable.</p> |   |                               |

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Exhibit R-2, RDT&E Budget Item Justification  
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| EXHIBIT R-2a, RDT&E Project Justification   |   |                |                |  |               | DATE: <b>FEBRUARY 2000</b> |                |                  |                 |
|---|---|----------------|----------------|--|---------------|----------------------------|----------------|------------------|-----------------|
| APPROPRIATION/BUDGET ACTIVITY   | PROGRAM ELEMENT NAME AND NUMBER           |                |                | PROJECT NAME AND NUMBER                          |               |                            |                |                  |                 |
| <b>RDT&amp;E, N/BA-5</b>  | <b>VIRGINIA Class Design Dev/0604558N</b> |                |                | <b>VIRGINIA Class HM&amp;E Development/F1947</b> |               |                            |                |                  |                 |
| COST (\$ in Million:  | FY 1999                                   | FY 2000        | FY 2001        | FY 2002  | FY 2003       | FY 2004                    | FY 2005        | Cost to Complete | Total Cost      |
| Project Cost  | <b>137.835</b>                            | <b>165.356</b> | <b>133.857</b> | <b>100.118</b>                                   | <b>94.971</b> | <b>101.146</b>             | <b>110.954</b> | <b>102.500</b>   | <b>1905.519</b> |
| RDT&E Articles Qty  |   |                |                |  |               |                            |                |                  |                 |
| <p>A. (U) Mission Description and Budget Item Justification: (U) This project encompasses all the ship system development efforts for the VIRGINIA Class Submarine. This project is essential to achieve balanced platform capability, affordability, and flexibility in a low rate production environment. The thrust of these efforts will be to develop and apply multiple, advanced system technologies which are integrated into the design of the VIRGINIA Class Submarine. New technologies are being transitioned from industry and Government research and development programs where doing so offers substantial performance and/or affordability payoffs. This p applies to completing system developments for the lead ship construction as well as transitions, technologies for insertion on future VIRGINIA Class Submarines.</p> <p>(U) Program Accomplishment and Plans:</p> <p>1. (U) FY 1999 Accomplishments:</p> <p>- (U) (\$120.731M) Continued design, manufacturing, and qualification testing of prototype technologies and components such as: ship service turbine generator (SSTG), weapons stowage, handling and launch systems; propulsor, main thrust bearing; electromagnetic signature reduction; special hull treatments; integrated low pressure electrolyzer system; ship control system; and, reverse osmosis desalination unit. Continue shock qualification testing and analyses of various components. Continue system verification studies, tests, and analyses in support of ship design including signature, hydrodynamics, materials, and survivability analyses and tests. Provide IPPD (Design/Build) team support at shipyards, Navy laboratories and in-house. Support ship design and construction efforts with engineering evaluations and ship integration assessments for emergent ship design and systems development issues. Initiate transitions from advanced research and Development (R&amp;D) projects and engineering developments of new technologies for potential insertion in the VIRGINIA Class Submarine including High Frequency Remote Ahead Profiling, Conformal Acoustic Velocity Sensor (CAVES), Accelerated Electromeric Silencing and additional Advanced Sail Development.</p> |   |                |                |  |               |                            |                |                  |                 |

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**Exhibit R-2a, RDT&E Project Justification**  
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| EXHIBIT R-2a, RDT&E Project Justification  |  | DATE:<br><b>FEBRUARY 2000</b>                                    |
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N/BA-5</b>  | PROGRAM ELEMENT NAME AND NUMBER<br><b>VIRGINIA Class Design Dev/0604558N</b> | PROJECT NAME AND NUMBER<br>VIRGINIA Class HM&E Development/F1947 |
| <p>- (U) (\$4.097M) Continued effectiveness analyses and evaluations relating to force effectiveness. Conducted analysis in support of force effectiveness assessment and component performance tradeoffs. Maintained cost reducing approach to VIRGINIA Class Submarine construction through use of IPPD's concurrent engineering and design/build philosophy. Continued coordination of VIRGINIA Class Submarine specification at the shipbuilder. Continued cost estimating and validation of cost reduction ideas for VIRGINIA Class Submarine overall design development. Continued environmental compliance and pollution prevention efforts.</p> <p>- (U) (\$8.879M) Continued development of: COTS support concepts, RM&amp;A modeling analyses, development of trainers and prototyping a digital data environment that supports the Continuous Acquisition Life Cycle Support virtual enterprise concept.</p> <p>- (U) (\$4.128M) Continued the development of the TEMP, VAR and NPTI. Plan and coordinate shipbuilder Test and Evaluation efforts. Provided IPPD support to COTF operational assessments. Prepared test plans, schedules and support associated with developmental testing, conduct Command and Control System Module Off-hull Test Series, Shock, Acoustic and Launchers Trials Testing, Weapons Accuracy Testing and Technical Evaluation. Conducted engineering evaluation of test results, Live Fire Test and Evaluation (LFT&amp;E) modeling and analysis. Continued development of the total ship test plan in support of Developmental Test/Operational Test (DT/OT), DT/OT-IIA-IIF.</p> |  |  |

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Exhibit R-2a, RDT&E Project Justification  
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| EXHIBIT R-2a, RDT&E Project Justification   |  | DATE:<br><b>FEBRUARY 2000</b>                                    |
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N/BA-5</b>   | PROGRAM ELEMENT NAME AND NUMBER<br><b>VIRGINIA Class Design Dev/0604558N</b> | PROJECT NAME AND NUMBER<br>VIRGINIA Class HM&E Development/F1947 |
| <p>2. (U) FY 2000 Plan:</p> <ul style="list-style-type: none"> <li>- (U) (\$145.964M) Continue design, manufacturing, and qualification testing of prototype technologies and components such as: ship service turbine generator (SSTG), weapons stowage, and handling systems; propulsor improvement, electromagnetics signature reduction; and ship control system. Continue shock qualification testing and analyses of various components. Continue system verification studies, tests, and analyses in support of ship design including signature, hydrodynamics, materials, and survivability analyses and tests. Provide Integrated Product and Process Development (IPPD) (Design/Build) team support at shipyards, Navy laboratories and in-house. Support ship design and construction efforts with engineering evaluations and ship integration assessments for emergent ship design and systems development issues. Continue transitions and engineering developments for new technology insertions into the VIRGINIA Class Submarine including Accelerated Electromagnetic (EM) Silencing, Towed Array Handling Control System, Acoustic Comms, and Elastomeric Ejection System.</li> <li>- (U) (\$3.919M) Continue effectiveness analyses and evaluations relating to force effectiveness. Conduct analysis in support of force effectiveness assessment and component performance tradeoffs. Maintain cost based approach to VIRGINIA Class Submarine construction through use of IPPD's concurrent engineering philosophy. Continue coordination of VIRGINIA Class Submarine specification at the shipbuilder. Continue cost estimating and validation of cost reduction ideas for VIRGINIA Class Submarine overall design development. Continue environmental compliance and pollution prevention efforts.</li> <li>- (U) (\$10.269M) Continue development of: Technology Refresh/COTS supportability concepts, Reliability, Maintainability, and Availability (RM&amp;A) modeling analyses, development of trainers and prototyping a digital data environment that supports the Continuous Acquisition Life Cycle Support virtual enterprise concept.</li> <li>- (U) (\$5.204M) Continue the development of the Test and Evaluation Master Plan (TEMP), Vulnerability Analysis Report (VAR) and Non-Propulsion Test Index (NPTI). Plan and coordinate second shipbuilder Test and Evaluation efforts. Provide IPPD support to Commander Operational Test and Evaluation Force (COTF) operational assessments. Prepare test plans, schedules and support associated with developmental testing, conduct Command and Control System Off-hull Test Series, Shock, Acoustic and Launchers Trials Testing, Weapons Accuracy Testing and Technical Evaluation. Conduct engineering evaluation of test results. LFT&amp;E modeling and analysis. Continue development of the total ship test plan in support of DT/OT-IIA-IIF.</li> </ul> |  |  |

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**Exhibit R-2a, RDT&E Project Justification**  
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| EXHIBIT R-2a, RDT&E Project Justification   |  | DATE:<br><b>FEBRUARY 2000</b>                                    |
| APPROPRIATION/BUDGET ACTIVITY<br><b>RDT&amp;E, N/BA-5</b>   | PROGRAM ELEMENT NAME AND NUMBER<br><b>VIRGINIA Class Design Dev/0604558N</b> | PROJECT NAME AND NUMBER<br>VIRGINIA Class HM&E Development/F1947 |
| <p>3. (U) FY 2001 Plan:</p> <ul style="list-style-type: none"> <li>- (U) (\$116.627M) Continue design, manufacturing, and qualification testing of prototype technologies and components such as: ship service turbine generator (SSTG), weapons stowage and handling systems; propulsor improvements, electromagnetics signature reduction; and ship control system. Continue shock qualification testing and analyses of various components. Continue system verification studies, tests, and analyses in support of ship design including signature, hydrodynamics, materials, and survivability analyses and tests. Provide Integrated Product and Process Development (IPPD) (Design/Build) team support at shipyards, Navy laboratories and in-house. Support ship design and construction efforts with engineering evaluations and ship integration assessments for emergent ship design and systems development issues. Continue transitions and engineering developments for new technology insertions into the VIRGINIA Class submarine including Accelerated Electromagnetic (EM) Silencing, Towed Array Handling Control System, Acoustic Comms, and Elastomeric Ejection System, Sonar Processing Improvements, Passive Ranging, Improved Submarine Launched Mobile Mine (ISLMM) Ship Integration, and Large Aperture Improvements.</li> <li>- (U) (\$2.491M) Continue effectiveness analyses and evaluations relating to force effectiveness. Conduct analysis in support of force effectiveness assessment and component performance tradeoffs. Maintain cost based approach to VIRGINIA Class submarine construction through use of IPPD's concurrent engineering philosophy. Continue coordination of VIRGINIA Class submarine specification at the shipbuilder. Continue cost estimating and validation of cost reduction ideas for VIRGINIA Class submarine overall design development. Continue environmental compliance and pollution prevention efforts.</li> <li>- (U) (\$8.606M) Continue development of: Technology Refresh/COTS support concepts, Reliability, Maintainability, and Availability (RM&amp;A) modeling analyses, analyses and trainers/training support.</li> <li>- (U) (\$6.133M) Continue the development of the Test and Evaluation Master Plan (TEMP), Vulnerability Analysis Report (VAR) and Non-Propulsion Test Index (NPTI). Plan and coordinate second shipbuilder Test and Evaluation efforts. Provide IPPD support to Commander Operational Test and Evaluation Force (COTF) operational assessments. Prepare test plans, schedules and support associated with developmental testing, conduct Command and Control System Off-hull Test Series, Shock, Acoustic and Launchers Trials Testing, Weapons Accuracy Testing and Technical Evaluation. Conduct engineering evaluation of test results. LFT&amp;E modeling and analysis. Continue development of the total ship test plan in support of DT/OT-IIA-IIF.</li> </ul> |  |  |

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**Exhibit R-2a, RDT&E Project Justification**  
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| EXHIBIT R-2a, RDT&E Project Justification |   |                                       | DATE:                |
|   |   |                                       | <b>FEBRUARY 2000</b> |
| APPROPRIATION/BUDGET ACTIVITY             | PROGRAM ELEMENT NAME AND NUMBER           | PROJECT NAME AND NUMBER               |                      |
| <b>RDT&amp;E, N/BA-5</b>                  | <b>VIRGINIA Class Design Dev/0604558N</b> | VIRGINIA Class HM&E Development/F1947 |                      |

B. (U) Other Program Funding Summary: (Dollars in Millior

|                              | FY 1999  | FY 2000 | FY 2001  | FY 2002  | FY 2003  | FY 2004  | FY 2005  | To Complete | TOTAL Program |
|------------------------------|----------|---------|----------|----------|----------|----------|----------|-------------|---------------|
| SCN Line 201300 PE: 0204281N | 1950.440 | 746.565 | 1711.234 | 1957.560 | 1936.740 | 1960.929 | 2363.469 | 43241.000   | 59944.000     |
| SCN Line 201310 PE: 0204281N | 0.000    | 0.000   | 0.000    | 0.000    | 0.000    | 0.000    | 0.000    | 0.000       | 589.200       |
| O&M,N BA-1 1D4D PE: 0708017N | 0.000    | 0.000   | 0.000    | 0.000    | 0.000    | 0.000    | 14.600   | 0.000       | 14.600        |
| O&M,N BA-2 1B2B PE: 0204283N | 0.000    | 0.000   | 0.000    | 0.000    | 0.000    | 20.500   | 20.500   | cont.       | cont.         |
| OPN Line Item 1320 BA-1      | 0.000    | 0.000   | 0.000    | 13.150   | 1.617    | 0.034    | 0.000    | 0.000       | 14.801        |
| OPN Line Item 2762 BA-2      | 0.000    | 0.000   | 0.000    | 8.366    | 0.950    | 0.000    | 0.000    | 0.000       | 9.316         |
| OPN Line Item 5661 BA-4      | 0.000    | 0.000   | 0.000    | 3.708    | 0.000    | 3.119    | 0.000    | 0.000       | 6.827         |
| OPN Line Item 542000 BA-4    | 0.000    | 0.000   | 0.000    | 0.000    | 0.000    | 0.000    | 12.400   | 0.000       | 12.400        |
| OPN Line Item 094200 BA-8    | 0.000    | 0.000   | 0.000    | 0.000    | 49.167   | 19.189   | 19.190   | cont.       | cont.         |

(U) Related RDT&E:

- (U) PE 0603561N (Advanced Submarine System Development)
- (U) PE 0603570N (Advanced Nuclear Power Systems)
- (U) PE 0602121N (Surface Ship Technology)

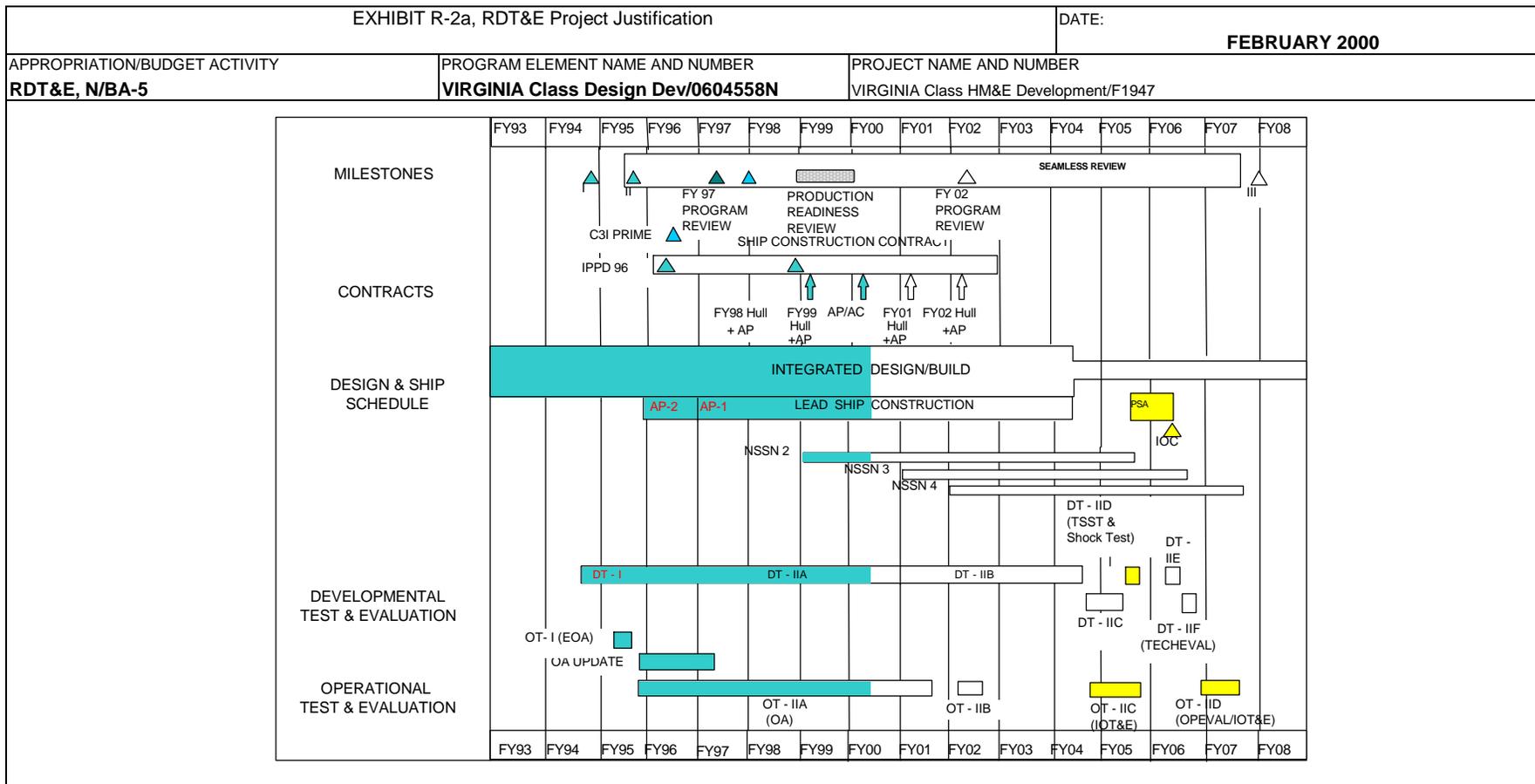
C. (U) Acquisition Strategy: The VIRGINIA Class Submarine Program has implemented Integrated Product and Process Development (IPPD). The VIRGINIA Class Submarine Program Office has collocated the engineering and program management personnel necessary to plan and pursue total ship system design management and life cycle acquisition responsibilities. The traditional distinct phasing of the design process has been replaced with the continuous concurrent engineering IPPD process. The IPPD approach will also facilitate a smoother transition from design to manufacturing, and reduce the number of changes typically encountered during construction of the Lead and early follow ships. In September 1997, Congress passed a law allowing the two companies to team for production of the first four VIRGINIA Class Submarines. Under the teaming agreement, Electric Boat remained the design yard for the VIRGINIA Class Submarine and Newport News Shipyard became a part of the IPPD process.

D. (U) Schedule Profile: See attached.

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**Exhibit R-2a, RDT&E Project Justification**  
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| Exhibit R-3 Cost Analysis (page 1)                                 |                              |                                      |   |               |                        |  |                        |               |                        | DATE: <b>FEBRUARY 2000</b> |               |                             |
|--|------------------------------|--------------------------------------|---|---------------|------------------------|--|------------------------|---------------|------------------------|----------------------------|---------------|-----------------------------|
| APPROPRIATION/BUDGET ACTIVITY                                      |                              |                                      | PROGRAM ELEMENT                           |               |                        | PROJECT NAME AND NUMBER                          |                        |               |                        |                            |               |                             |
| <b>RDT&amp;E, N/BA-5</b>   |                              |                                      | <b>VIRGINIA Class Design Dev/0604558N</b> |               |                        | <b>VIRGINIA Class HM&amp;E Development/F1947</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 |
| Primary Hardware Development                                       |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Ancillary Hardware Development                                     |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Component Development  | SS/CPFF                      | EB-2103 Groton, CT                   | 286.618                                   | 42.469        | Various                | 36.323   | Various                | 22.375        | Various                | 0.000                      | 387.785       | 397.300                     |
| Main Propulsion Complex Dev  | SS/CPFF                      | EB-4030 Groton, CT                   | 153.819                                   | 28.737        | Various                | 29.764   | Various                | 10.275        | Various                | 4.653                      | 227.248       | 223.500                     |
| Component Development  | WR                           | NSWC Carderock, MD                   | 245.961                                   | 36.127        | 11/98                  | 30.949   | 11/99                  | 26.273        | 11/00                  | 117.327                    | 456.637       | N/A                         |
| Component Development  | WR                           | NAWC Orlando, FL                     | 6.977                                     | 3.367         | 11/98                  | 5.383  | 11/99                  | 3.176         | 11/00                  | 12.124                     | 31.027        | N/A                         |
| Component Development  | WR                           | NUWC Newport, RI                     | 54.886                                    | 4.921         | 11/98                  | 11.628   | 11/99                  | 11.428        | 11/00                  | 0.172                      | 83.035        | N/A                         |
| Technology Insertion   | Various                      | Miscellaneous                        | 3.000                                     | 6.400         | Various                | 16.200   | Various                | 17.576        | Various                | 87.596                     | 130.772       | N/A                         |
| Component Development  | Various                      | Miscellaneous                        | 176.094                                   | 2.611         | Various                | 21.603   | Various                | 29.514        | Various                | 23.857                     | 253.679       | N/A                         |
| Systems Engineering  |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Licenses   |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Tooling  |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| GFE  |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Award Fees   |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Subtotal Product Development                                       |                              |                                      | 927.355                                   | 124.632       |                        | 151.850  |                        | 120.617       |                        | 245.729                    | 1570.183      |                             |
| Remarks:   |                              |                                      |   |               |                        |  |                        |               |                        |                            |               |                             |
| Development Support Equipment                                      |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Software Development   |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Training Development   |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Integrated Logistics Support                                       |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Configuration Management   |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Technical Data   |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| GFE  |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Subtotal Support   |                              |                                      | 0.000                                     | 0.000         |                        | 0.000  |                        | 0.000         |                        | 0.000                      | 0.000         |                             |
| Remarks: Not Applicable.   |                              |                                      |   |               |                        |  |                        |               |                        |                            |               |                             |

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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>VIRGINIA Class Design Dev/0604558N</b> |               |                        | <b>VIRGINIA Class HM&amp;E Development/F1947</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                                    |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Operational Test & Evaluation                                      |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Test & Evaluation  | WR                           | NSWC Carderock, MD                   | 1.211                                     | 0.766         | 11/98                  | 1.760  | 11/99                  | 1.444         | 11/00                  | 134.256                    | 139.437       | N/A                         |
| Test & Evaluation  | WR                           | NUWC, Newport, RI                    | 3.687                                     | 1.497         | 11/98                  | 1.947  | 11/99                  | 2.114         | 11/00                  | 42.286                     | 51.531        | N/A                         |
| Test & Evaluation  | C/CPAF                       | EG&G-C6411 Rockville, MD             | 1.095                                     | 1.129         | Various                | 1.020  | Various                | 1.150         | Various                | 7.350                      | 11.744        | 11.800                      |
| Test & Evaluation  | Various                      | Miscellaneous                        | 5.202                                     | 0.972         | Various                | 0.477  | Various                | 1.425         | Various                | 24.475                     | 32.551        | N/A                         |
| Tooling  |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| GFE  |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Subtotal T&E   |                              |                                      | 11.195                                    | 4.364         |                        | 5.204  |                        | 6.133         |                        | 208.367                    | 235.263       |                             |
| Remarks:   |                              |                                      |   |               |                        |  |                        |               |                        |                            |               |                             |
| Contractor Engineering Support                                     |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Contractor Support Services  | C/CPAF                       | EG&G-C6411 Rockville, MD             | 4.000                                     | 6.321         | Various                | 4.079  | Various                | 3.255         | Various                | 26.645                     | 44.300        | 46.300                      |
| Contractor Spt Services/Award Fees                                 | C/CPAF                       | EG&G-C6411 Rockville, MD             | 0.526                                     | 0.506         | Various                | 0.326  | Various                | 0.260         | Various                | 2.940                      | 4.558         | 5.000                       |
| Contractor Support Services  | Various                      | Miscellaneous                        | 15.706                                    | 2.012         | Various                | 3.897  | Various                | 3.592         | Various                | 26.008                     | 51.215        | 46.800                      |
| Government Engineering Support                                     |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Program Management Support   |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Travel   |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Labor (Research Personnel)   |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Overhead   |                              |                                      |   |               |                        |  |                        |               |                        |                            | 0.000         |                             |
| Subtotal Management  |                              |                                      | 20.232                                    | 8.839         |                        | 8.302  |                        | 7.107         |                        | 55.593                     | 100.073       |                             |
| Remarks:   |                              |                                      |   |               |                        |  |                        |               |                        |                            |               |                             |
| Total Cost   |                              |                                      | 958.782                                   | 137.835       |                        | 165.356  |                        | 133.857       |                        | 509.689                    | 1905.519      | N/A                         |
| Remarks:   |                              |                                      |   |               |                        |  |                        |               |                        |                            |               |                             |

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| EXHIBIT R-2a, RDT&E Project Justification   |  |   |         |         |  |         | DATE: <b>FEBRUARY 2000</b> |         |                  |            |
|---|--|---|---------|---------|--|---------|----------------------------|---------|------------------|------------|
| APPROPRIATION/BUDGET ACTIVITY   |  | PROGRAM ELEMENT NAME AND NUMBER           |         |         | PROJECT NAME AND NUMBER                        |         |                            |         |                  |            |
| <b>RDT&amp;E, N/BA-5</b>  |  | <b>VIRGINIA Class Design Dev/0604558N</b> |         |         | VIRGINIA Class Combat System Development/F1950 |         |                            |         |                  |            |
| COST (\$ in Million)  |  | FY 1999                                   | FY 2000 | FY 2001 | FY 2002  | FY 2003 | FY 2004                    | FY 2005 | Cost to Complete | Total Cost |
| Project Cost  |  | 72.546                                    | 74.670  | 73.234  | 60.761   | 57.257  | 46.331                     | 44.394  | 34.300           | 920.299    |
| RDT&E Articles Qty  |  |   |         |         |  |         |                            |         |                  |            |
| <p>A. (U) Mission Description and Budget Item Justification: (U) This project encompasses the top level systems development, tested integration into the ship of the VIRGINIA Class Submarine C3I System (formerly referred to as Combat Systems), which includes multiple subsystems. The scope of the system is expanded from Sonar and Combat Control subsystems to include AN/BLQ-10 Electronic Support (ES) Measures, Exterior Communications, Submarine Regional Warfare System, Navigation, Total Ship Monitoring, Imaging, Tactical Acoustic Communications, Radar, Interior Communications, Tactical Support Devices, Fiber Optic Cable Subsystem, and Special Purpose Subsystems, such as Battle Force Team Trainer and others. VIRGINIA Class Submarine specific development efforts including requirements definition, software, hardware development, software/hardware test, prototype production, and electronic integration as well as physical integration into the platform.</p> <p>(U) VIRGINIA Class Submarine implementation approach is based on Open System, Commercial-off-the-Shelf (COTS) Non-Developmental Items or subsystems. The program leverages on-going subsystems developments or developing new subsystems where needed to satisfy VIRGINIA Class requirements. The recurring cost of VIRGINIA Class Submarine C3I Systems is being reduced to meet the program's affordability goals. Modifications to many subsystems must be developed to: (1) reduce the shipbuilding and construction recurring costs through the use of COTS components; (2) use proven computer technologies to evolve to an Open System design; (3) enhance capabilities to support expanded operational requirements, reduced manning, and reduced shipboard component footprint.</p> <p>(U) To meet the collective future threat, the submarine force must operate as effectively in littoral regions as it traditionally has in open ocean. Close coordination with surface battle groups and airborne units is essential to mission accomplishment. To meet the VIRGINIA Class Submarine mission, the following capabilities are provided by the VIRGINIA Class Submarine C3I System: (1) Passive and Active detection of multiple contacts, including early warning threat determination through processing and analysis of sensor data; (2) classification of sensor data for the purpose of identifying contacts; (3) localization (tracking) of contacts through target motion analysis; (4) preset, launch, and control of weapons and countermeasures; (5) improved communication and connectivity with other battle group elements, airborne units, and special operations forces; (6) incorporation of vertical launch system to enhance strike warfare; and (7) more effective covert surveillance through video imaging with onboard digital enhancement capabilities, and improved electronic warfare analysis capabilities.</p> |  |   |         |         |  |         |                            |         |                  |            |

R-1 SHOPPING LIST - Item No. 108

**Exhibit R-2a, RDT&E Project Justification**  
(Exhibit R-2a, page 12 of 20)

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| EXHIBIT R-2a, RDT&E Project Justification  |   | DATE:  |
|--|---|--|
| APPROPRIATION/BUDGET ACTIVITY  | PROGRAM ELEMENT NAME AND NUMBER           | PROJECT NAME AND NUMBER                        |
| <b>RDT&amp;E, N/BA-5</b>   | <b>VIRGINIA Class Design Dev/0604558N</b> | VIRGINIA Class Combat System Development/F1950 |
| <p>(U) Accomplishments and Plans:</p> <p>1. (U) FY 1999 Accomplishments:</p> <ul style="list-style-type: none"><li>- (U) (\$12.782M) System level development activities continued in the following areas: Structurally Integrated Enclosure (SIE) electronic integration; development and validation of C3I System test and evaluation procedures to support integration testing and installation/test into the platform; and conduct system engineering functions such as requirements management, interface control, test and evaluation planning to support formal DT/OT; C3I Subsystem platform integration and external interface integration planning.</li><li>- (U) (\$51.807M) Continued Sonar, Combat Control, and Architecture subsystem development; completed hardware and software development; completed final critical design review; continued logistics support and the procurement of test hardware and support to non-propulsion electronics intra-subsystem integration.</li><li>- (U) (\$7.957M) Completed Imaging sub-system Non-Propulsion Electronics System (NPES) software Rev 1 and continued EDM development. Completed AN/BLQ-10 ES sub-system EDM development with acceptance of 2 EDMs and delivered 1 EDM to Technical Design Agent for integration testing. Continued development efforts to support unique requirements for other subsystems.</li></ul> <p>2. (U) FY 2000 Plan:</p> <ul style="list-style-type: none"><li>- (U) (\$14.897M) System level development activities continue in the following areas: SIE electronic integration; development and validation of C3I System test and evaluation procedures to support integration testing and installation/test into the platform; and conduct system engineering functions such as requirements management, interface control, test and evaluation planning to support formal DT/OT; C3I Subsystem platform integration and external interface integration planning.</li></ul> |   |  |

R-1 SHOPPING LIST - Item No. 108

**Exhibit R-2a, RDT&E Project Justification**  
(Exhibit R-2a, page 13 of 20)

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| EXHIBIT R-2a, RDT&E Project Justification  |   | DATE:  |
|--|---|--|
| APPROPRIATION/BUDGET ACTIVITY  | PROGRAM ELEMENT NAME AND NUMBER           | PROJECT NAME AND NUMBER                        |
| <b>RDT&amp;E, N/BA-5</b>   | <b>VIRGINIA Class Design Dev/0604558N</b> | VIRGINIA Class Combat System Development/F1950 |
| <p>- (U) (\$57.155M) Complete Sonar, Combat Control, and Architecture (S/CC/A) subsystem preliminary product baseline development; complete initial phase of subsystem System Design Certification Testing (SDCT). Continue inter-subsystem integration in preparation for November 2000 delivery of the VIRGINIA Class Submarine preliminary product baseline subsystem. Begin detailed S/CC/A engineering support to shipyard intra- and inter-subsystem integration. Begin development of Post Shakedown Availability (PSA) deliveries of technology refreshment changes to S/CC/A subsystems.</p> <p>- (U) (\$2.618M) Complete Imaging sub-system NPES Rev 0 development. Perform AN/BLQ-10 ES sub-system EDM at-sea technical and operational evaluations and obtain milestone III production approval. Continue development efforts to support unique requirements for other subsystems.</p> <p>3. (U) FY 2001 Plan:</p> <p>- (U) (\$23.103M) System level development activities continue in the following areas: SIE electronic integration; development and validation of C3I System test and evaluation procedures to support integration testing and installation/test into the platform; and conduct system engineering functions such as requirements management, interface control, test and evaluation planning to support formal DT/OT; and begin C3I System integration and external interface operability testing. Begin development of system changes identified by integration efforts. Begin development of Post Shakedown Availability (PSA) deliveries of technology refreshment changes to C3I System/subsystems.</p> <p>- (U) (\$48.924M) Continue detailed S/CC/A engineering support to shipyard intra- and inter-subsystem integration. Conduct operability and integration testing. Continue development of Post Shakedown Availability (PSA) deliveries of technology refreshment changes to S/CC/A subsystems. Begin integration of tactical tomahawk capability into S/CC/A subsystem.</p> <p>- (U) (\$1.207M) Complete Imaging sub-system at-sea test and evaluation. Continue AN/BLQ-10 ES sub-system EDM at-sea technical and operational evaluations and obtain milestone III production approval. Continue development efforts to support unique requirements for other subsystems.</p> |   |  |

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Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, page 14 of 20)

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| EXHIBIT R-2a, RDT&E Project Justification   |   |         |          |  |          |          | DATE: <b>FEBRUARY 2000</b> |             |               |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |
|---|---|---------|----------|--|----------|----------|----------------------------|-------------|---------------|--|--|---------|---------|---------|---------|---------|---------|---------|-------------|---------------|------------------------------|----------|---------|----------|----------|----------|----------|----------|-----------|-----------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|---------|-----------------------------|-------|-------|-------|-------|-------|-------|--------|-------|--------|------------------------------|-------|-------|-------|-------|-------|--------|--------|-------|-------|-------------------------|-------|-------|-------|--------|-------|-------|-------|-------|--------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------------------|-------|-------|-------|-------|-------|-------|--------|-------|--------|---------------------------|-------|-------|-------|-------|--------|--------|--------|-------|-------|
| APPROPRIATION/BUDGET ACTIVITY   | PROGRAM ELEMENT NAME AND NUMBER           |         |          | PROJECT NAME AND NUMBER                        |          |          |                            |             |               |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |
| <b>RDT&amp;E, N/BA-5</b>  | <b>VIRGINIA Class Design Dev/0604558N</b> |         |          | VIRGINIA Class Combat System Development/F1950 |          |          |                            |             |               |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |
| <p>B. (U) Other Program Funding Summary: (Dollars in Millions)</p> <table border="1"> <thead> <tr> <th></th> <th>FY 1999</th> <th>FY 2000</th> <th>FY 2001</th> <th>FY 2002</th> <th>FY 2003</th> <th>FY 2004</th> <th>FY 2005</th> <th>To Complete</th> <th>TOTAL Program</th> </tr> </thead> <tbody> <tr> <td>SCN Line 201300 PE: 0204281N</td> <td>1950.440</td> <td>746.565</td> <td>1711.234</td> <td>1957.560</td> <td>1936.740</td> <td>1960.929</td> <td>2363.469</td> <td>43241.000</td> <td>59944.000</td> </tr> <tr> <td>SCN Line 201310 PE: 0204281N</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>589.200</td> </tr> <tr> <td>O&amp;M,N BA-1 1D4D PE:0708017N</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>14.600</td> <td>0.000</td> <td>14.600</td> </tr> <tr> <td>O&amp;M,N BA-2 1B2B PE: 0204283N</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>20.500</td> <td>20.500</td> <td>cont.</td> <td>cont.</td> </tr> <tr> <td>OPN Line Item 1320 BA-1</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>13.150</td> <td>1.617</td> <td>0.034</td> <td>0.000</td> <td>0.000</td> <td>14.801</td> </tr> <tr> <td>OPN Line Item 2762 BA-2</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>8.366</td> <td>0.950</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>9.286</td> </tr> <tr> <td>OPN Line Item 5661 BA-4</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>3.708</td> <td>0.000</td> <td>3.119</td> <td>0.000</td> <td>0.000</td> <td>6.827</td> </tr> <tr> <td>OPN Line Item 542000 BA-4</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>12.400</td> <td>0.000</td> <td>12.400</td> </tr> <tr> <td>OPN Line Item 094200 BA-8</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>0.000</td> <td>49.167</td> <td>19.189</td> <td>19.190</td> <td>cont.</td> <td>cont.</td> </tr> </tbody> </table> <p>(U) Related RDT&amp;E:</p> <ul style="list-style-type: none"> <li>(U) PE 0603504N (Advanced Submarine Combat Systems Development)</li> <li>(U) PE 0603561N (Advanced Submarine System Development)</li> <li>(U) PE 0603562N (Submarine Tactical Warfare Systems)</li> <li>(U) PE 0603570N (Advanced Nuclear Power Systems)</li> <li>(U) PE 0604503N (Submarine System Equipment Development)</li> <li>(U) PE 0604574N (Navy Tactical Computer Resources)</li> <li>(U) PE 0604777N (Navigation/ID Systems)</li> <li>(U) PE 0101226N (Submarine Acoustic Warfare Development)</li> <li>(U) PE 0604562N (Submarine Tactical Warfare System)</li> <li>(U) PE 0604524N (Submarine Combat System)</li> </ul> |   |         |          |  |          |          |                            |             |               |  |  | FY 1999 | FY 2000 | FY 2001 | FY 2002 | FY 2003 | FY 2004 | FY 2005 | To Complete | TOTAL Program | SCN Line 201300 PE: 0204281N | 1950.440 | 746.565 | 1711.234 | 1957.560 | 1936.740 | 1960.929 | 2363.469 | 43241.000 | 59944.000 | SCN Line 201310 PE: 0204281N | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 589.200 | O&M,N BA-1 1D4D PE:0708017N | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 14.600 | 0.000 | 14.600 | O&M,N BA-2 1B2B PE: 0204283N | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 20.500 | 20.500 | cont. | cont. | OPN Line Item 1320 BA-1 | 0.000 | 0.000 | 0.000 | 13.150 | 1.617 | 0.034 | 0.000 | 0.000 | 14.801 | OPN Line Item 2762 BA-2 | 0.000 | 0.000 | 0.000 | 8.366 | 0.950 | 0.000 | 0.000 | 0.000 | 9.286 | OPN Line Item 5661 BA-4 | 0.000 | 0.000 | 0.000 | 3.708 | 0.000 | 3.119 | 0.000 | 0.000 | 6.827 | OPN Line Item 542000 BA-4 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 12.400 | 0.000 | 12.400 | OPN Line Item 094200 BA-8 | 0.000 | 0.000 | 0.000 | 0.000 | 49.167 | 19.189 | 19.190 | cont. | cont. |
|   | FY 1999                                   | FY 2000 | FY 2001  | FY 2002  | FY 2003  | FY 2004  | FY 2005                    | To Complete | TOTAL Program |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |
| SCN Line 201300 PE: 0204281N  | 1950.440                                  | 746.565 | 1711.234 | 1957.560                                       | 1936.740 | 1960.929 | 2363.469                   | 43241.000   | 59944.000     |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |
| SCN Line 201310 PE: 0204281N  | 0.000                                     | 0.000   | 0.000    | 0.000  | 0.000    | 0.000    | 0.000                      | 0.000       | 589.200       |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |
| O&M,N BA-1 1D4D PE:0708017N   | 0.000                                     | 0.000   | 0.000    | 0.000  | 0.000    | 0.000    | 14.600                     | 0.000       | 14.600        |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |
| O&M,N BA-2 1B2B PE: 0204283N  | 0.000                                     | 0.000   | 0.000    | 0.000  | 0.000    | 20.500   | 20.500                     | cont.       | cont.         |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |
| OPN Line Item 1320 BA-1   | 0.000                                     | 0.000   | 0.000    | 13.150   | 1.617    | 0.034    | 0.000                      | 0.000       | 14.801        |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |
| OPN Line Item 2762 BA-2   | 0.000                                     | 0.000   | 0.000    | 8.366  | 0.950    | 0.000    | 0.000                      | 0.000       | 9.286         |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |
| OPN Line Item 5661 BA-4   | 0.000                                     | 0.000   | 0.000    | 3.708  | 0.000    | 3.119    | 0.000                      | 0.000       | 6.827         |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |
| OPN Line Item 542000 BA-4   | 0.000                                     | 0.000   | 0.000    | 0.000  | 0.000    | 0.000    | 12.400                     | 0.000       | 12.400        |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |
| OPN Line Item 094200 BA-8   | 0.000                                     | 0.000   | 0.000    | 0.000  | 49.167   | 19.189   | 19.190                     | cont.       | cont.         |  |  |         |         |         |         |         |         |         |             |               |                              |          |         |          |          |          |          |          |           |           |                              |       |       |       |       |       |       |       |       |         |                             |       |       |       |       |       |       |        |       |        |                              |       |       |       |       |       |        |        |       |       |                         |       |       |       |        |       |       |       |       |        |                         |       |       |       |       |       |       |       |       |       |                         |       |       |       |       |       |       |       |       |       |                           |       |       |       |       |       |       |        |       |        |                           |       |       |       |       |        |        |        |       |       |

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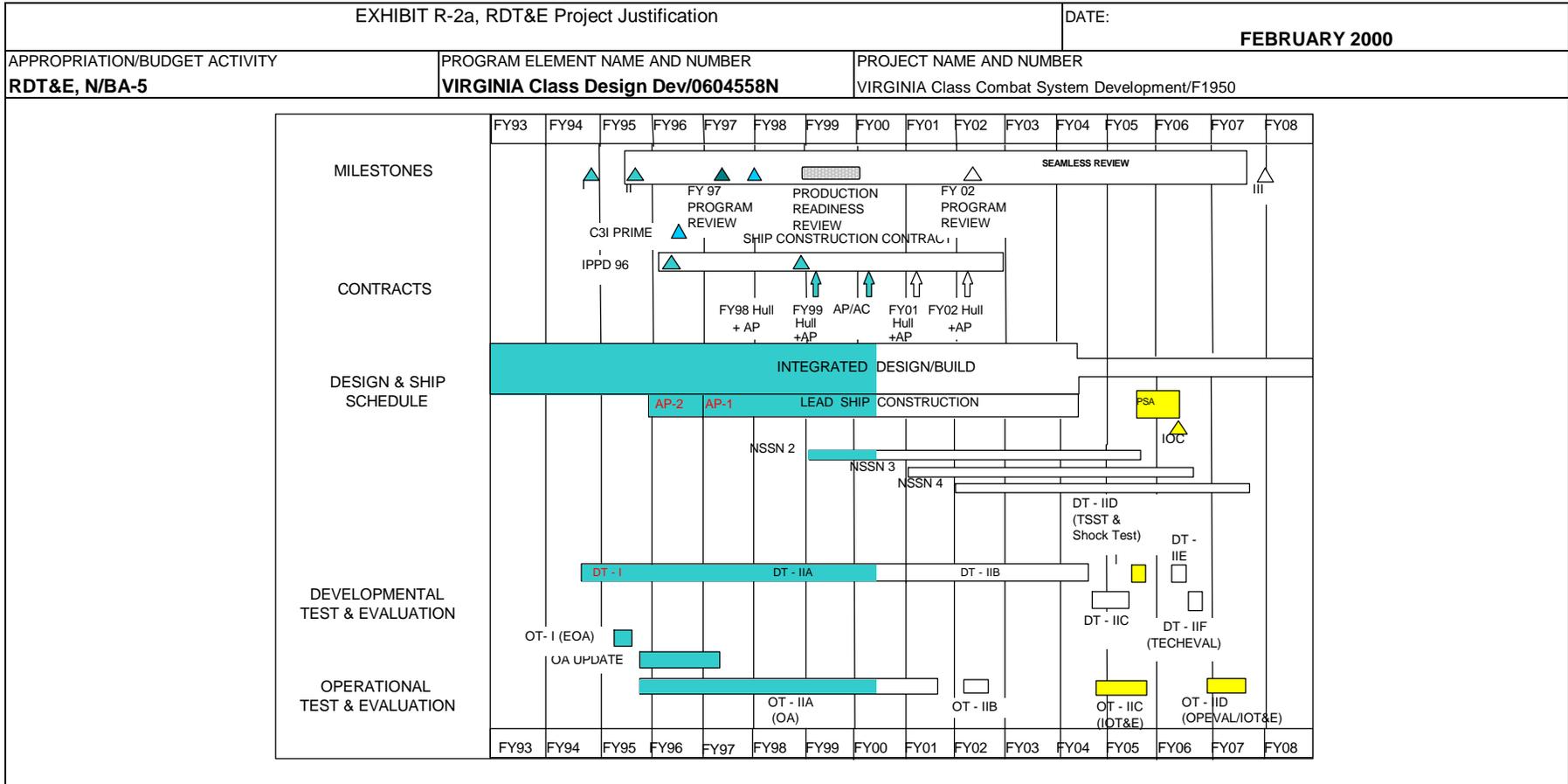
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| EXHIBIT R-2a, RDT&E Project Justification  |   | DATE:  |
|--|---|--|
| APPROPRIATION/BUDGET ACTIVITY  | PROGRAM ELEMENT NAME AND NUMBER           | PROJECT NAME AND NUMBER                        |
| <b>RDT&amp;E, N/BA-5</b>   | <b>VIRGINIA Class Design Dev/0604558N</b> | VIRGINIA Class Combat System Development/F1950 |
| <p>C. (U) Acquisition Strategy: The VIRGINIA Class Submarine Program has implemented Integrated Product and Process Development (IPPD). The VIRGINIA Class Submarine Program Office has collocated the engineering and program management personnel necessary to plan and pursue total ship system design management and life cycle acquisition responsibilities. The traditional distinct phasing of the design process has been replaced with the continuous concurrent engineering IPPD process. The IPPD approach will also facilitate a smoother transition from design to manufacturing, and reduce the number of changes typically encountered during construction of the lead and early follow ships. In September 1997, Congress passed a law allowing the two companies to team for production of the first four VIRGINIA Class Submarines. Under the teaming agreement, Electric Boat remained the design yard for the VIRGINIA Class Submarine and Newport News Shipyard became a part of the IPPD process.</p> <p>D (U) Schedule Profile: See attached.</p> |   |  |

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R-1 SHOPPING LIST - Item No. 108

Exhibit R-2a, RDT&E Project Justification  
(Exhibit R-2a, Page 17 of 20)

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| Exhibit R-3 Cost Analysis (page 1)                                 |                              |                                      |   |               |                        |   |                        |               |                        | DATE: <b>FEBRUARY 2000</b> |               |                             |
|--|------------------------------|--------------------------------------|---|---------------|------------------------|---|------------------------|---------------|------------------------|----------------------------|---------------|-----------------------------|
| APPROPRIATION/BUDGET ACTIVITY                                      |                              |                                      | PROGRAM ELEMENT                           |               |                        | PROJECT NAME AND NUMBER                               |                        |               |                        |                            |               |                             |
| <b>RDT&amp;E, N/BA-5</b>   |                              |                                      | <b>VIRGINIA Class Design Dev/0604558N</b> |               |                        | <b>VIRGINIA Class Combat System Development/F1950</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 |
| C3I Prime Contract E&MD Total                                      | C/CPAF                       | Lockheed Manassas, VA                | 111.277                                   | 33.753        | Various                | 32.100  | Various                | 17.800        | Various                | 37.600                     | 232.530       | 232.261                     |
| C3I Prime Contract E&MD Award Fee                                  | C/CPAF                       | Lockheed Manassas, VA                | 5.610                                     | 4.500         | Various                | 1.200   | Various                | 0.100         | Various                | 1.300                      | 12.710        | 11.700                      |
| C3I Prime Contract Post Delivery                                   | C/FFP                        | Lockheed Manassas, VA                |   |               |                        | 2.500   | Various                | 11.400        | Various                | 22.000                     | 35.900        | 35.900                      |
| Advanced Display Sys (AN/UYQ-70)                                   | SS/CPFF                      |                                      |   |               |                        |   |                        |               |                        |                            |               |                             |
|  | CPIF                         | Lockheed St. Paul, MN                | 18.050                                    | 1.366         | 11/98                  | 1.609   | 11/99                  | 1.840         | 12/00                  | 6.500                      | 29.365        | 29.365                      |
| Multi-Purpose Processor  | SS/CPIF                      | Digital Sys Fairfax, VA              | 41.449                                    |               |                        |   |                        |               |                        |                            | 41.449        | 41.449                      |
| Multi-Purpose Processor  | SS/CPIF                      | Lockheed Manassas, VA                | 1.755                                     |               |                        |   |                        |               |                        |                            | 1.755         | 1.755                       |
| Photonics  | C/CPIF                       | Kollmorgen Northhampton, MA          | 21.554                                    | 1.788         | 11/98                  | 0.176   | 12/99                  | 0.185         | 12/00                  | 6.603                      | 30.306        | 29.842                      |
| Non-Penetrating Periscope  | C/CPIF                       | Kollmorgen Northhampton, MA          | 4.060                                     |               |                        |   |                        |               |                        |                            | 4.060         | 4.060                       |
| Electronic Support Measures  | C/FFP                        | Lockheed Syracuse, NY                | 36.252                                    | 0.752         | 05/98                  |   |                        |               |                        |                            | 37.004        | 37.004                      |
| Platform Integration   | SS/CPFF                      | EB Corp Groton, CT                   | 17.783                                    | 1.668         | Various                | 2.060   | 11/99                  | 2.120         | 12/00                  | 6.840                      | 30.471        | 31.032                      |
| Platform Integration   | SS/CPFF                      | NNews Shipbuilding NNews, VA         | 2.725                                     |               |                        |   |                        |               |                        |                            | 2.725         | 2.725                       |
| Integrated Electronic Mast   | SS/CPIF                      | Goleta Portsmouth, RI                | 8.897                                     |               |                        |   |                        |               |                        |                            | 8.897         | 8.897                       |
| Tactical Simulator   | SS/CPFF                      | Goleta Portsmouth, RI                | 2.750                                     |               |                        |   |                        |               |                        |                            | 2.750         | 2.750                       |
| High Frequency Sail Array  | SS/CPFF                      | Applied Research Austin, TX          | 3.273                                     |               |                        |   |                        |               |                        |                            | 3.273         | 3.273                       |
| Navigation/Radar   | SS/CPFF                      | Sperry Corp Charlottesville, VA      | 5.122                                     | 1.404         | Various                | 0.200   | 01/00                  | 0.219         | 01/01                  | 0.980                      | 7.925         | 7.925                       |
| Technology Refreshment   | Various                      | TBD                                  |   |               |                        |   |                        | 9.345         | Various                | 26.531                     | 35.876        | N/A                         |
| Open System Module   | SS/CPFF                      | UNISYS Corp St. Paul, MN             | 2.500                                     |               |                        |   |                        |               |                        |                            | 2.500         | 2.500                       |
| Technical Direction Agent  | N/A                          | NUWC Newport, RI                     | 120.587                                   | 17.581        | Various                | 13.575  | Various                | 12.472        | Various                | 60.087                     | 224.302       | N/A                         |

R-1 SHOPPING LIST - Item No. 108

**Exhibit R-3, Project Cost Analysis**  
(Exhibit R-3, page 18 of 20)

**UNCLASSIFIED**

CLASSIFICATION:

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| Exhibit R-3 Cost Analysis (page 1)                                 |                              |                                      |   |               |                        |   |                        | DATE: <b>FEBRUARY 2000</b> |                        |                     |               |                             |
|--|------------------------------|--------------------------------------|---|---------------|------------------------|---|------------------------|----------------------------|------------------------|---------------------|---------------|-----------------------------|
| APPROPRIATION/BUDGET ACTIVITY                                      |                              |                                      | PROGRAM ELEMENT                           |               |                        | PROJECT NAME AND NUMBER                               |                        |                            |                        |                     |               |                             |
| <b>RDT&amp;E, N/BA-5</b>   |                              |                                      | <b>VIRGINIA Class Design Dev/0604558N</b> |               |                        | <b>VIRGINIA Class Combat System Development/F1950</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 |
| Systems Engineering  | N/A                          | NSWC Cardock, MD                     | 2.590                                     | 0.538         | 11/98                  | 0.505   | 11/99                  | 0.515                      | 12/99                  | 2.600               | 6.748         | N/A                         |
| Systems Engineering  | N/A                          | NSWC Crane, IN                       | 2.222                                     | 0.553         | 11/98                  | 0.225   | 11/99                  | 0.205                      | 12/99                  | 0.808               | 4.013         | N/A                         |
| Systems Engineering  | N/A                          | SSC Charleston, SC                   | 2.333                                     | 0.000         |                        | 0.000   |                        |                            |                        |                     | 2.333         | N/A                         |
| Systems Engineering  | N/A                          | SSC San Diego, CA                    | 1.459                                     | 0.076         | 11/98                  | 0.161   | 11/99                  | 0.167                      |                        | 0.584               | 2.447         | N/A                         |
| Systems Engineering  | N/A                          | NUWC Keyport, WA                     | 1.450                                     | 0.420         | 11/98                  | 0.435   | 11/99                  | 0.500                      | 01/00                  | 1.584               | 4.389         | N/A                         |
| Miscellaneous  | Various                      | Various                              | 18.594                                    | 3.406         | Various                | 13.234  | Various                | 9.377                      |                        | 28.734              | 73.345        | N/A                         |
| Subtotal Product Development                                       |                              |                                      | 432.292                                   | 67.805        |                        | 67.980  |                        | 66.245                     |                        | 202.751             | 837.073       | N/A                         |
| Remarks:   |                              |                                      |   |               |                        |   |                        |                            |                        |                     |               |                             |
| Development Support Equipment                                      |                              |                                      |   |               |                        |   |                        |                            |                        |                     | 0.000         |                             |
| Software Development   |                              |                                      |   |               |                        |   |                        |                            |                        |                     | 0.000         |                             |
| Training Development   |                              |                                      |   |               |                        |   |                        |                            |                        |                     | 0.000         |                             |
| Integrated Logistics Support                                       |                              |                                      |   |               |                        |   |                        |                            |                        |                     | 0.000         |                             |
| Configuration Management   |                              |                                      |   |               |                        |   |                        |                            |                        |                     | 0.000         |                             |
| Technical Data   |                              |                                      |   |               |                        |   |                        |                            |                        |                     | 0.000         |                             |
| GFE  |                              |                                      |   |               |                        |   |                        |                            |                        |                     | 0.000         |                             |
| Subtotal Support   |                              |                                      | 0.000                                     | 0.000         |                        | 0.000   |                        | 0.000                      |                        | 0.000               | 0.000         |                             |
| Remarks: Not Applicable.   |                              |                                      |   |               |                        |   |                        |                            |                        |                     |               |                             |

R-1 SHOPPING LIST - Item No. 108

**Exhibit R-3, Project Cost Analysis**  
(Exhibit R-3, page 19 of 20)

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CLASSIFICATION:

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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>VIRGINIA Class Design Dev/0604558N</b> |               |                        | <b>VIRGINIA Class Combat System Development/F1950</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                                    |                              |                                      |   |               |                        |   |                            |               |                        |                     | 0.000         |                             |
| Operational Test & Evaluation                                      |                              |                                      |   |               |                        |   |                            |               |                        |                     | 0.000         |                             |
| Test & Evaluation  | Various                      | Various                              | 0.000                                     | 0.000         |                        | 0.200   | Various                    | 0.230         | Various                | 25.840              | 26.270        | N/A                         |
| Tooling  |                              |                                      |   |               |                        |   |                            |               |                        |                     | 0.000         |                             |
| GFE  |                              |                                      |   |               |                        |   |                            |               |                        |                     | 0.000         |                             |
| Subtotal T&E   |                              |                                      | 0.000                                     | 0.000         |                        | 0.200   |                            | 0.230         |                        | 25.840              | 26.270        |                             |
| Remarks:   |                              |                                      |   |               |                        |   |                            |               |                        |                     |               |                             |
| Contractor Engineering Support                                     |                              |                                      |   |               |                        |   |                            |               |                        |                     | 0.000         |                             |
| Contractor Support Services/ETS                                    | C/CPAF                       | EG&G Rockville, VA                   | 4.400                                     | 3.516         | Various                | 4.749   | Various                    | 4.489         | Various                | 4.315               | 21.469        | 21.469                      |
| CSS/ETS Award Fee  | C/CPFF                       | EG&G Rockville, VA                   | 0.352                                     | 0.335         | Various                | 0.380   | Various                    | 0.359         | Various                | 0.345               | 1.771         | 1.771                       |
| Contractor Support Services/ETS                                    | C/CPFF                       | EG&G Rockville, VA                   | 8.857                                     |               |                        |   |                            |               |                        |                     | 8.857         | 8.857                       |
| Contractor Support Services/ETS                                    | C/CPFF                       | SWL Inc. Vienna, VA                  | 5.705                                     |               |                        |   |                            |               |                        |                     | 5.705         | 5.705                       |
| Contractor Support Services/ETS                                    | C/CPFF                       | American Sys Chantilly, VA           | 2.099                                     |               |                        |   |                            |               |                        |                     | 2.099         | 2.099                       |
| Miscellaneous  | Various                      | Various                              | 3.101                                     | 0.890         | Various                | 1.361   | Various                    | 1.911         | Various                | 9.792               | 17.055        | 17.055                      |
| Program Management Support   |                              |                                      |   |               |                        |   |                            |               |                        |                     | 0.000         |                             |
| Travel   |                              |                                      |   |               |                        |   |                            |               |                        |                     | 0.000         |                             |
| Subtotal Management  |                              |                                      | 24.514                                    | 4.741         |                        | 6.490   |                            | 6.759         |                        | 14.452              | 56.956        |                             |
| Remarks:   |                              |                                      |   |               |                        |   |                            |               |                        |                     |               |                             |
| Total Cost   |                              |                                      | 456.806                                   | 72.546        |                        | 74.670  |                            | 73.234        |                        | 243.043             | 920.299       | N/A                         |
| Remarks:   |                              |                                      |   |               |                        |   |                            |               |                        |                     |               |                             |

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