

Advance Notice Dablgren

N00178-98-0-1012

Software Engineering, Analysis, Research Development, Test & Evaluation Support  
SOW FOR K DEPARTMENT OMNIBUS

18/7/05.

**BACKGROUND:**

The Government requires support in lifetime systems leadership and support for Navy strategic and weapons systems control in related core technical capabilities for the Naval Surface Warfare Center, Dahlgren Division. These efforts include concept and requirements development, design, integration and testing of SLBM, Cruise Missile, ASW and Gun Weapon System. The following paragraphs describe each of the areas in detail. These tasks require technical and management support in the areas of mission planning, high performance computer programs, weapons control, systems engineering, hypersonic weapons, reentry body technology and integrated ship strike capability.

**DIVISIONS:**

These programs are conducted across divisions which have their own missions with varied types of applications. K Department is comprised of five (5) divisions of which primarily four will be supported by this contract. They are: the SLBM Research and Analysis Division (K40), the SLBM Software Development Division (K50), the Strike Weapons Systems Division (K70), and the Maritime Warfare Control Systems Division (K90). The remainder of the department, including other divisions and department staff, may be supported for tasking that falls within the scope of this contract.

**SCOPE:**

This support services contract is intended to obtain quick reaction, relatively short term, as well as continuing support for all mission areas supported by the Divisions mentioned above in the Strategic and Weapons Control Systems Department as well as other technical organizations at the Naval Surface Warfare Center, Dahlgren Division. K is a diversified organization which provides a variety of products and services through programs and functions oriented around computers, software and information and communication systems. Mission areas for the participating divisions within K are further defined in the following paragraphs.

**SLBM RESEARCH AND ANALYSIS DIVISION (K40):**

The SLBM Research and Analysis Division (K40) allocates system requirements to software, specifies software requirements, and performs geoballistic research in support of systems

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development. This work includes, but is not limited to:

- a. Designing and developing fire control computational algorithms, and define computational architecture;
- b. Coordinating development of fire control software specifications for the United States (US) and United Kingdom (UK) SLBM systems, and support specification testing;
- c. Designing, implementing, documenting, and maintaining software systems essential for the SLBM program, including the SSGN - Guides Missile Submarine portion;
- d. Developing and maintaining operational software that is compatible with system capabilities for the United State Strategic Command (USSTRATCOM) and the Alternate Command Center (ACC);
- e. Maintaining and fostering interfaces with USSTRATCOM and the Commander Task Forces (CTFs);
- f. Developing mission data and performing analysis for all SLBM test flights and SSGN test flights as required;
- g. Analyzing existing and advanced SLBM and SSGN systems, including future systems concepts, and developing deterministic simulations of the total system; and
- h. Researching and analyzing weapon system performance.

### SLBM SOFTWARE DEVELOPMENT DIVISION (K50):

The SLBM Software Development Division (K50) performs research and development in systems and software engineering. The division produces, distributes, and maintains operational products to the Fleet. This work includes, but is not limited to:

- a. Supporting the Fleet with documentation, an active Fleet interface, and responses to Fleet problems;
- b. Performing software logistics planning, production, and processing of media and data to/from the Fleet;
- c. Designing, developing, integrating, testing, maintaining, and configuration managing operational software for the SLBM WCS and the SSGN Launch Control System (LCS);
- d. Conducting concept exploration to support future SLBM and SSGN system development;
- e. Developing and maintaining complete software computing environment encompassing hardware, software, security

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- and operating procedures; and
- f. Performing Configuration Management (CM), Quality Control (QC), Review and Audit, independent Verification, and Formal Qualification Testing (FQT) of all generated Fleet products, including Programs, data, and documentation.

### **STRIKE WEAPONS SYSTEMS DIVISION (K70):**

The Strike Weapons Systems Division (K70) provides total system engineering support for Strike Weapons Systems and provides life cycle support for Strike Weapon Control Systems. This work includes, but is not limited to:

- a. Weapon System level requirements definition, concept development, analysis, system integration and system test.
- b. For Strike Weapon Control, this includes Weapon Controls System Requirements analysis and definition, prototyping of high-risk areas, software design and development, software integration and qualification testing, and fleet support for operational software.
- c. For emerging systems, K70 develops operational concepts and prototypes that describe and demonstrate potential support by the Strike Weapon/Weapon Control System.
- d. The Strike Weapons Systems Division monitors methodologies and processes utilized to perform the development and support activities and initiates thrusts to improve the quality and minimize the resources required to produce the division's products.
- e. K70 encourages teamwork and commitment while promoting a professional environment, which fosters innovation, excellence and pride.

### **MARITIME WARFARE CONTROL SYSTEMS DIVISION (K90):**

The Maritime Warfare Control Systems Division (K90) provides Highest Quality Weapons and Fire Control Systems in Support of the Navy's Surface Force. We execute our mission by applying systems' expertise to the development of warfare control systems adhering to the principle that our systems are fully engineered within the context of the "Total Warfighting Environment" and the need for "Coordinated Multi-platform Joint Operations". This work includes, but is not limited to:

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- a. Applying systems' expertise to the development of warfare control systems
- b. Adhering to the principle that our systems are fully engineered within the context of the "Total Warfighting Environment"
- c. Adhering to the principle that our systems are fully engineered within the need for "Coordinated Multi-platform Joint Operations".

In providing this support, the contractor shall perform activity associated with the Performance Objectives as shown below in Table 1.

targets model used by UK  
are verified by US codes

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Table 1 PERFORMANCE OBJECTIVES

PERFORMANCE OBJECTIVE TITLE	TASK TO BE ACCOMPLISHED
<p>1. Formal Qualification Testing (FQT) Task</p> <p><i>to make in US.</i></p>	<p>The contractor shall perform the verification, acceptance, static and/or dynamic testing tasks for up to fifteen (15) models, including Fire Control (FC) support software, <u>United Kingdom (UK) reference/simulation models, US/UK targeting models</u> and SLBM general purpose tools. The contractor shall assist by developing, writing, and updating test case input for the Software Test Description (STD) along with Software Test Reports (STR) for assigned models. The contractor shall assist K523 by executing and analyzing the test cases developed for assigned models. Static testing shall be accomplished in accordance with the Quality Assurance (QA) Methodology. For the QA of UK models, the contractor shall assist K52 by analyzing the <u>software, data and documentation</u> to verify that all US-only items have been removed. During the implementation of the STD for assigned models, the document will be updated as necessary. The contractor shall provide documentation of the results of any portions of the tasks in which the contractor assists. The contractor shall develop utility software such as coding standards checkers for FORTRAN, C and graphics programs as required for this QA task on the DGS, <u>SMGS</u>, PC and/or SUN. The contractor shall assist the software project lead auditor(s) by completing audit questionnaires as required. The contractor shall prepare and deliver monthly progress reports.</p>
<p>2. Distributed Graphics System Network (DGSNET) Maintenance and</p>	<p>The contractors shall provide Technicians where functions shall include, but not be limited to receipt of deliveries, support for inventories,</p>

SCSI Media Control System

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<p>Technical Support</p>	<p>entering data as required, maintaining a technical knowledge of current systems, attending meetings by direction as required, and providing support in the maintenance and enhancement of all K40/K50 equipment. The contractor shall provide technical personnel to perform all functions necessary to bring ADP equipment for an initial condition "off state", to the point where it is available for production use. The contractor shall provide documentation, to include but not be limited to procedures for installation and maintenance of all new enhancements made to K40/K50 networks, documentation on all network load studies conducted, providing procedures for K40/K50 systems and/or components, writing and/or updating Routine Maintenance Procedures, and writing and/or updating Network Troubleshooting Procedures. Contractor will be required to hold a clearance of Secret and be able to hold up to a Top Secret as deemed necessary. The contractor shall prepare and submit monthly progress reports.</p>
<p>3. SSP Fire Control and Guidance Branch (SP23) Tasking</p>	<p>The contractor shall provide support to Fire Control (FC) Systems program personnel in management and execution of the Fire Control Modernization and SPALT program. The contractor shall participate in, and chair, as requested, SP23 Change Control Boards, working group meetings and software product team meetings. The contractor will provide program level documentation, documentation support, and coordinate recommended changes for publication and distribution. The contractor will review design and specification documents for adequacy and adherence to requirements. The contractor will coordinate, document and maintain with all FC activities the SP23 cognizant program, safety and related SPALT Program action items. The contractor</p>

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will assist in preparing the implementation reports required by DOD ACAT Programs. The contractor shall participate in and support the generation of program briefings. The contractor shall provide documentation configuration management and analysis support, in electronic versions on the DGS Network and paper copy, for documentation related to the Strategic Weapons System Fire Control System upgrade. The contractor shall provide meeting support for the NSWCCD SP23 program (SWS and AWCS) related meetings and reviews. The contractor shall assess the impact hardware and/or software changes may have on hardware and/or software implementation, system operation, fleet documentation and ordnance and nuclear safety. The contractor shall assist in developing Depot Availability Program/Engineered Overhaul work packages, test procedures and planning for D5 Backfit as required. The contractor shall review and analyze fleet documents, program planning documents, and other documents as requested. The contractor shall evaluate proposed weapons systems upgrades to their value and impact. The contractor shall generate report on results of analyses and investigation in technical memorandum format. The contractor shall prepare material for, participate in, and support SLBM meetings and briefings as requested. The contractor shall provide support to SP23 Shipboard Systems Personnel in analysis, oversight, and execution of SLBM development and deployment programs. The contractor shall provide support to SP20 Weapons System Program Personnel in the analysis, oversight, and execution of paper and electronic documentation and nuclear/conventional safety. The contractor shall prepare and submit monthly progress reports.

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4. Models and Database Support	The contractor shall maintain, modify, and verify changes to SLBM models hosted on the DGS, SGI, or PC computer system, as specified by the government. The contractor may be tasked to convert existing models from the DGS environment to a PC. The contractor may also be tasked to design, code, checkout, and document additional software on general purpose computer systems as needed. The contractor shall maintain, modify, verify, and disseminate changes to software tools residing on the DGS Classified computer systems and PCs. The contractor may be tasked to design and develop new UNIX-based tools (programs and scripts) that satisfy the functional requirements defined by the government. The contractor may be tasked to assist with composing a handbook that documents the methodology for software environments. The contractor shall provide support for the evaluation and implementation of software and hardware tools and the migration of software to new implementations, including different workstation platforms and CM tools (e.g., Dimensions). The contractor shall make modifications to existing <u>databases on the DGS</u> . The contractor may be tasked to design, code, checkout, and, if necessary, populate all or part of a new database application, as required by a Software Requirements Specification (SRS). The contractor may be tasked to perform research and development tasks related to Database Management, as set forth by the government. The contractor shall prepare and submit monthly progress reports.
5. Storage and Media Analysis	The contractor shall maintain the Magnetic Tape Cartridge (MTC) Certification process, WASC TR 4F3-0002, consisting of several major tests and thorough step-by-step documentation.



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<p>Support Management Information System (ILSMIS)</p>	<p>modules. The contractor shall provide additional IBPES databases as required. The contractor shall provide technical assistance in the creation and distribution of IBPES branch/program manager update disks for SLBM planning cycles as specified. The contractor shall provide technical assistance on an as needed basis for the operation and maintenance of IBPES for the SLBM Program Office. The contractor shall provide technical support and develop appropriate interfaces to/from IBPES to accommodate transition to new operating environments and software technology. The contractor shall provide upgrades to existing IBPES SLBM customizations so that the SLBM Program Office can use the most recent version of IBPES which is using Oracle as the backend database. The contractor shall provide technical support for integrating sponsor generation program and sponsor historical data into the overall financial system. The contractor shall prepare and maintain use's guides for IBPES for both Stub Maintenance and Budget Management. The contractor shall prepare and submit monthly progress reports.</p>
<p>7. K40 Training</p>	<p>The contractor shall develop and deliver training material that covers, in detail, major concepts associated with the computation of presettings for the TRIDENT II missile. The contractor shall provide training based on the developed materials. The contractor shall prepare and submit monthly progress reports.</p>
<p>8. Diversified Aircrew Readiness Training Support (DARTS)</p>	<p>The contractor shall produce a User's Guide and other documentation. The contractor shall use information in the existing Help files, and other information provided by NSWCDD to prepare a User's Guide. The contractor shall provide technical writing assistance for the revision of existing</p>

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	<p>exercise manuals. The contractor shall provide technical assistance on an as needed basis for the conversion of raw acoustical data to "wave files" to be written to CDs. The contractor shall prepare and submit monthly progress reports.</p>
<p>9. Modeling and Simulation (M&amp;S) Verification Validation and Accreditation (VV&amp;A)</p>	<p>The contractor shall support NSWC Dahlgren briefings to program offices regarding M&amp;S VV&amp;A as directed, to include the preparation of briefing materials. The contractor shall attend working group meetings as directed by the government, and may be asked to prepare and disseminate written minutes. The contractor shall collect, review, and assemble the efforts of working groups and produce consistent and coherent publications in support of the various phases of VV&amp;A, or in support of the NSWC Dahlgren VV&amp;A team. The contractor shall refine and maintain a NSWC Dahlgren M&amp;S VV&amp;A World Wide Web Site. The contractor shall provide technical support to NSWC Dahlgren in the development of Top Level VV&amp;A documents, to include policy papers and guidance instruction. The contractor shall investigate options for the development of Interactive Course Ware (ICW) modules to address training needs for NSWC Dahlgren VV&amp;A team members. Contractor will be required to hold a clearance of Secret and be able to hold up to a Top Secret as deemed necessary. The contractor shall provide monthly status reports which shall detail monthly funding and scheduling milestones.</p>
<p>10 Ship, Submersible Guided Nuclear (SSGN)</p>	<p>The contractor shall provide support to NSWCDD Guided Missile Submarine (SSGN)-designated personnel in the management and execution of the SSGN project/program including the AWCS Design &amp; Deployment Team (ADDT) and AWCS Program Management Team (APMT). The contractor shall participate in, as</p>

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	<p>requested, the preparation of SSGN AWCS DDT, AWCS PMT, and LCS 102 CDT meetings, and shall be responsible for generating and distributing advanced agenda and supporting meeting materials. The contractor shall participate in, as requested, SSGN AWCS DDT, AWCS PMT and LCS102 CDT, Working Groups and Focus Team meetings and Technical Reviews, and shall be responsible for the preparation and posting of meeting minutes and action item lists. The contractor shall participate in and support the generation of program briefings. The contractor will provide program level documentation, documentation support, AWCS Master Schedule support, and coordinate recommended changes for publication and distribution. The contractor shall review program, design, and specification documents for consistency with SSGN requirements as required. The contractor shall participate in the SP23 SSGN AWCS Documentation Working Group and other such working groups, as required. The contractor shall perform analysis of the tasks necessary for the operation of the AWCS and develop and/or review the corresponding procedural documentation defining the required steps and procedures. The contractor shall maintain databases such as the AWCS Action Item Database/Milestone Database, AWCS Decision Database, and files on the NSWCCD SSGN Documentation Repository, as directed by the Government. The contractor shall prepare and submit monthly progress reports.</p>
<p>11 System Software Engineering</p>	<p>All work performed under this acquisition shall be performed following NSWCCDD K72 &amp; K73 software development plans, standards, policies, and processes. The contractor shall generate plans for specific tasking consistent with the government's master schedule for product development to</p>

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	<p>include scoping of the task, schedule development and preparation of workload estimates. The contractor shall perform software engineering analysis in support of software systems including requirements analysis, software problem (Change Requests) and discrepancy resolution, enhancement assessment, and implementation analysis. The contractor shall be assigned software elements of a designated system to design and/or develop using established NSWCCD processes and procedures. The contractor shall generate and maintain development schedules consistent and in support of the government's master schedule. The contractor shall provide expert software support for all levels of formal software testing including Integration Agent (IA) activities, system level test, and Formal Qualification Test (FQT). As assigned, the contractor shall provide software engineering and technical support on panels and boards. As required, the contractor shall prepare and produce new and modified sections of documentation, e.g., Software Requirements Specification (SRS). The contractor shall provide support to the Software Integration Agent (IA). The contractor shall provide support to the government for system and software processes improvement and the Standard Capability Maturity Model Integration (CMMI) Appraisal Method for Process Improvement (SCAMPI) style appraisal. The contractor shall maintain metrics as established by the WCS program and provide a Metrics Report on a monthly basis for evaluation of program progress and efficiency, as directed.</p>
<p>12 Systems Engineering</p>	<p>All work performed under this acquisition shall be performed following NSWCCD K71 systems engineering standards, policies, and processes. The contractor shall generate plans for</p>

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	<p>specific tasking consistent with the government's master schedule for product development to include scoping of the task, schedule development and preparation of workload estimates. The contractor shall be required to provide expert systems engineering support for all levels of design and development. As directed, the contractor shall participate in the mission analysis efforts supporting system concept definition and initial system design. The contractor shall develop and/or maintain external interface documentation with other Navy and Joint systems. The contractor shall participate in the development of system level requirements. The contractor shall perform system architectural design activities for new systems development. The contractor shall prepare and submit monthly progress reports.</p>
13 System Test Engineering	<p>All work performed under this acquisition shall be performed following NSWCDD K74 system test development plans, standards, policies, and processes. The contractor shall generate plans for specific tasking consistent with the government's master schedule for product development to include scoping of the task, schedule development and preparation of workload estimates. The contractor shall be required to provide expert system test support for all levels of system testing including both laboratory and shipboard environments. As directed, the contractor shall develop a Test Plan for each approved software version. The contractor shall develop Test Procedures that verify performance with respect to system requirements. The contractor shall validate the Test Procedure Documents through inspections and by a procedure checkout (PCO) using the designated test facility. At the</p>

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	completion of testing, the contractor shall prepare a test report, as directed, and summary of lessons learned. On a continuing basis, the contractor shall evaluate test coverage with respect to test type, test validity, test scenarios, test conduct, test results, and CR database content. The contractor shall prepare and submit monthly progress reports.
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### Contract Data Requirements List (CDRL)

The following is a list of the Contract Data Requirements List items applicable to this contract.

- A001 - Contractor's Progress, Status & Management Report
- A002 - Technical Report - Study/Services (Miscellaneous Reports)
- A003 - Computer Software Product End Items
- A004 - System/Subsystem Specification
- A006 - Conference Agenda
- A007 - Presentation Material
- A008 - Software Requirement Specification
- A009 - Interface Requirements Specification
- A010 - Software Users Manual
- A012 - Interface Design Description
- A013 - Software Test Plan
- A014 - Software Test Description
- A015 - Technical Report - Study/Services (Memorandums)
- A016 - Report, Record of Meeting/Minutes
- A017 - Software Test Report
- A018 - Technical Report - Study/Services (Software Problem Report)
- A022 - Operating Procedures Manual (Maintenance & Operations Manuals)
- A023 - Critical Task Analysis Report
- A025 - Technical Report - Study/Services (Fleet Documentation Outlines)
- A029 - Operating Procedures Manual (Standard Operating Procedures (SOPs))

### Government Furnished Items:

Each Technical Instruction will identify the material available as Government Furnished Equipment (GFE) or Government Furnished Information (GFI). In general, past K Department documentation

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and program documentation will be available for use to complete the tasks.

### **Travel Requirements:**

Travel is required for many tasks associated with K Department support. Travel is required for both inside the United States (local and distant) and abroad. Each individual Technical Instruction will identify the estimated travel required to support the system.

### **Security:**

The contractor's facility must be cleared at the SECRET level for handling/storage of documentation. All individuals except those in the Junior Engineer/Analyst categories must possess a SECRET clearance. Junior Engineer/Analysts must have a Confidential clearance. Some individuals may be required to be authorized for Critical Nuclear Weapons Design Information (CNWDI).

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<p align="center">1</p>	<p>The contractor shall develop or assist in the development process in specifying equipment requirements that will be required in the certification of new media and equipment related to the <u>new media for future SLBM applications</u>. The contractor shall generate and perform various repairs to media under evaluation or designated for use in SLBM applications. The contractor shall provide engineering support in the analysis, design, and specifications of a variety of computer storage media that includes prepare and submit reports of findings. The contractor shall analyze or assist in the analysis of requirements in the support of future upgrades in media supporting applications in the SLBM Program. The contractor shall develop or assist in the development of engineering design specification, operational scenarios, and performance requirements of new media for future SLBM. The contractor shall develop or assist in the development of software, recommend changes to existing software in the support of media testing, specifications, and repair processes and procedures. The contractor shall conduct media testing and repairs within a facility meeting the OSHA specifications. The contractor shall develop and/or maintain specifications and documentation for the procurement and testing of storage media. The contractor shall provide or assist in investigative criteria, development, and engineering support for the design and development of storage media test equipment and fixtures. The contractor shall prepare and submit monthly progress reports.</p>
<p>6. Integrated Budget Planning and Execution System (IBPES)/ Integrated Logistics</p>	<p>The contractor shall provide IBPES program modifications according to specifications for custom SLBM related financial reports and IBPES data entry</p>