

Marine Acoustics, Inc. is proud to be featured as a subcontractor for the following, “Development, Technical, Management, and Engineering Services for Maritime and Littoral Area Surveillance Technologies,” contract N66001-06-D-5021. For more information, please call the MAI Contracts Dept. at 401-847-7508.

## **STATEMENT OF WORK**

### **1.0 SCOPE**

The scope of this Statement of Work (SOW) includes program and configuration management, technical services, systems engineering, algorithm development, hardware and software development, material analysis, data processing, testing, repair, installation, deployment, recovery, and analysis in support of maritime and littoral area surveillance technologies. In addition, the scope of this SOW includes program and configuration management, technical services, systems engineering, algorithm development, hardware and software development, material analysis, data processing, testing, repair, installation, deployment, recovery, and analysis of any robotics or unmanned subsurface, surface, or air vehicle that could be used in maritime or littoral surveillance operations.

### **1.1 Background**

The Space and Naval Warfare Systems Center, San Diego (SSC San Diego), has the requirement to provide Research, Development, Test and Evaluation (RDT&E) services and technical engineering services in support of several on-going programs which relate to the development, improvement, implementation and continued effectiveness of systems necessary for Naval surveillance and intelligence analysis.

Currently, SSC San Diego is developing and demonstrating prototype acoustic and non-acoustic (magnetic, seismic, infrared, radar, electric field, laser) sensors, data collection processes and systems, signal processing systems, data fusion systems, and data transfer systems in support of the following programs: Integrated Undersea Surveillance System (IUSS), Waterside Security System (WSS), Littoral Combat Ship (LCS), and the Joint Robotics Program (JRP). Other technologies SSC San Diego supports, which are inherent subsystems and components of the above systems, include Mobile Inshore Undersea Warfare (MIUW), wireless communication systems development for real-time/near real-time target data relay, Meteorological and Oceanographic (METOC) systems for performance prediction, and positioning systems technologies development for accurate sensor and platform localization. These systems and technologies are also being considered for use in projects such as: ocean survey systems development, mammal migration tracking, joint services surveillance (unattended ground sensors, counter-proliferation), global warming, and contraband interdiction.

In support of maritime surveillance, SSC San Diego provides a full range of engineering and technical support for surveillance systems and support systems. This includes:

- a) System Specification and Design;

- b) System Fabrication and Integration;
- c) System Test and Evaluation;
- d) System Studies and Analysis; and
- e) System Documentation and Program Management.
- f) System Installation and Training

In order to fulfill the surveillance mission, SSC San Diego periodically requires additional engineering and technical expertise to satisfy the requirement. Separate task orders are required in these instances to achieve the flexible, responsive demands of surveillance system support.

## **2.0 APPLICABLE DOCUMENTS**

The documents listed below may be invoked, for guidance only, on individual task orders.

MIL-STD-38784	Standard Practice for Manuals, Technical: General Style and Format Requirements
MIL-HDBK-454	A General Guidelines for Electronic Equipment
MIL-STD-961E	Defense And Program-Unique Specifications Format And Content
MIL-DTL-31000C	Technical Data Packages
NOSC-D-10017	Technical Manual Contract Requirement (General Delivery Order Technical Manual Requirement)
ASN, RD&A Memorandum	DON Policy on Digital Product/Technical Data dated 23 October 2004

## **3.0 TECHNICAL REQUIREMENTS**

As specified in individual task orders, the contractor shall perform the following tasks.

### **3.1 Specification and Design**

The contractor may be tasked to design maritime and littoral area surveillance systems for undersea, surface, port, coastal land based, and airborne platforms and systems. In addition, the contractor may be tasked to design robotics and unmanned vehicle systems that could be used with such maritime or littoral area surveillance systems. The contractor shall:

3.1.1 Develop requirements, specifications and designs at the system, subsystem and component level for maritime and littoral area surveillance projects, robotics, and unmanned vehicles. Develop requirements, specifications and designs for communication systems associated with maritime and littoral area surveillance projects, robotics, and unmanned vehicles.

3.1.2 Use computer modeling to simulate systems and environments for performance predictions, initial concept feasibility studies, and design optimization for maritime or littoral area surveillance systems, robotics, and unmanned vehicles.

3.1.3 Specify, design, and develop analog and digital hardware test aids/interfaces for signal acquisition, signal conditioning, signal processing, information processing, and display processing for maritime and littoral area surveillance, robotics, and unmanned vehicle projects.

3.1.4 Specify, design, and develop hardware and software for data acquisition and data processing systems used on maritime and littoral area surveillance, robotics, and unmanned vehicle platforms.

3.1.5 Specify, design, and develop mechanical hardware required in the development, test, deployment, or retrieval of maritime and littoral area surveillance, robotics, and unmanned vehicle systems.

3.1.6 Specify, design, and develop systems required to satisfy government environmental and marine mammal safety requirements to test, deploy, and operate any maritime and littoral area surveillance systems.

3.1.7 Specify, design, and develop fiber optic cable and electronic systems with fiber optic interfaces, including telemetry and networked systems, for maritime and littoral area surveillance, robotics, and unmanned vehicle projects.

3.1.8 Specify, design, and develop cable handling systems for maritime and littoral area surveillance, robotics, and unmanned vehicle projects.

3.1.9 Specify, design, and develop signal processing algorithms, signal characteristics and signal extraction techniques for maritime and littoral area surveillance, robotics, and unmanned vehicle projects.

3.1.10 Prepare engineering drawings, design documents, parts lists, technical reports, change proposals, and other technical data for maritime and littoral area surveillance, robotics, and unmanned vehicle projects.

## **3.2 Fabrication, Development, Integration, Assembly, and Installation**

The contractor may be tasked to fabricate, develop, integrate, assemble, and install maritime and littoral area surveillance systems. In addition, the contractor may be tasked to fabricate, integrate, and install robotics and unmanned vehicle systems that could be used with such maritime or littoral area surveillance systems. The contractor shall:

3.2.1 Fabricate, integrate, assemble, and install systems, analog and digital hardware test aids/interfaces for signal acquisition, signal conditioning, signal processing,

information processing and display processing for maritime and littoral area surveillance, robotics, and unmanned vehicle systems.

3.2.2 Fabricate, integrate, assemble, and install fiber optic cable and electronic systems with fiber optic interfaces including telemetry and networked systems for maritime and littoral area surveillance, robotics, and unmanned vehicle projects.

3.2.3 Fabricate, integrate, assemble, and install cable handling systems for maritime and littoral area surveillance, robotics, and unmanned vehicle projects.

3.2.4 Develop, integrate, and install any software used in the operation or test of maritime and littoral area surveillance, robotics, and unmanned vehicle systems.

3.2.5 Fabricate, integrate, assemble, and install mechanical hardware required in the development, test, and deployment of maritime and littoral area surveillance, robotics, and unmanned vehicle systems.

3.2.6 Fabricate, integrate, assemble, and install any electronic, acoustic, optical, or mechanical interfaces required by maritime and littoral area surveillance, robotics, and unmanned vehicle systems.

3.2.7 Fabricate, develop, integrate, assemble, and install hardware and software required to satisfy government environmental and marine mammal safety regulations required to test, deploy, and operate any maritime and littoral area surveillance systems.

3.2.8 Develop technical manuals, operator/maintenance manuals, concepts of operations manuals, operations guidelines, and operating procedures for maritime and littoral area surveillance, robotics, and unmanned vehicle systems.

### **3.3 Test and Evaluation, Deployment, Operation, Recovery, and Repair**

The contractor may be tasked to test, evaluate, deploy, operate, recover, and repair maritime and littoral area surveillance systems. In addition, the contractor may be tasked to test, evaluate, deploy, operate, recover, and repair robotics and unmanned vehicle systems that could be used with such maritime or littoral area surveillance systems. The contractor shall:

3.3.1 Perform all steps necessary to test, evaluate, deploy, operate, recover, and repair maritime and littoral area surveillance, robotics, and unmanned vehicle systems.

3.3.2 Provide test bed systems, associated support, and integration services for maritime and littoral area surveillance, robotics, and unmanned vehicle systems.

3.3.3 Analyze test results and generate analysis reports for maritime and littoral area surveillance, robotics, and unmanned vehicle systems.

### **3.4 Studies and Analysis**

The contractor may be tasked to conduct studies and perform analyses on maritime and littoral area surveillance systems. In addition, the contractor may be tasked to conduct studies and perform analyses on robotics and unmanned vehicle systems that could be used with such maritime or littoral area surveillance systems. The contractor shall:

3.4.1 Study, analyze, and make recommendations for concepts or enhancements to maritime and littoral area surveillance, robotics, and unmanned vehicle systems.

3.4.2 Prepare updates to concept of operations documents for maritime and littoral area surveillance, robotics, and unmanned vehicle systems.

3.4.3 Study and analyze the theoretical and operational performance of maritime and littoral area surveillance, robotics, and unmanned vehicles systems.

3.4.4 Perform research in automated search methodology for target detection and automated-resource allocation for target tracking and acquisition.

3.4.5 Study latest technical information related to maritime and littoral area surveillance, robotics, and unmanned vehicle systems. Predict the performance of current surveillance systems and future surveillance systems by selecting appropriate parameters for existing models and analyze the results.

3.4.6 Analyze and evaluate signal processing algorithms, signal characteristics and signal extraction techniques for maritime and littoral area surveillance, robotics and unmanned vehicle projects.

3.4.7 Reduce and process data by using contractor and government facilities. Use applicable simulations or performance evaluation models to determine the effectiveness of maritime and littoral area surveillance, robotics, and unmanned vehicle systems. Process data, analyze results, and compare to results obtained from other systems, simulations, and performance evaluation models.

3.4.8 Analyze the propagation of acoustic and non-acoustic energy through the ocean and air media.

3.4.9 Study systems by performing and analyzing computer simulation and test results.

3.4.10 Measure and analyze optical cable parameters of fiber-optic cables.

### **3.5 Documentation, Configuration Management, and Program Management**

The contractor may be tasked to prepare documentation and management plans in accordance with the Contract Data Requirements List, DD Form 1423. Data deliverables

must comply with applicable document “DON Policy on Digital Product/Technical Data.”

3.5.1 The contractor shall prepare documentation and presentation material related to maritime and littoral area surveillance systems, and robotics and unmanned vehicles systems that could be used in maritime and littoral area surveillance operations. Such documentation and material may include program plans, program schedules, requirements, specifications, agendas, meeting minutes, design review documents, and budgets.

3.5.2 The contractor shall participate and provide technical expertise in meetings related to maritime and littoral area surveillance systems, and robotics and unmanned vehicles systems that could be used in maritime and littoral area surveillance operations.

3.5.3 The contractor shall review program management documents. The contractor shall provide input and recommendations.

3.5.4 The contractor shall perform configuration management.

### **3.6 Training**

3.6.1 The contractor shall develop step-by-step operating procedure manuals, training plans and materials, and conduct training courses for maritime and littoral area surveillance systems, and robotics and unmanned vehicle systems that could be used in maritime and littoral area surveillance operations.