

# TECHNICAL INSTRUCTION (TI)

Issue Date of TI	10 February 2009
TI No.	0001
Revision	R14 – Travel to Crane added -Contingent Upon funds availability (2/18/11) Severability of tasking identified
Contract No.	N00178-07-D-5218
Task Order No.	FC01
Government Agency	NSWC Crane
Vendor	Rex Systems, Inc.
Vendor POC	Frank Dzurbala
Human Capital Checklist Approval Number	N/A
Severability (Severable/Non-Severable)	Severable
Special Skills Required	N/A
Applicable SOW Paragraph	3.1, 3.2, 3.3, 3.4, 3.4.1, 3.4.2, 3.4.3
Task Description	<p>The Contractor shall provide the identified tasks to assist with the achievement and sustainment of the AN/SPS-49's Transmitter specified operational availability through redesign, improvements to built-in-test fault identification and isolation, and design of system health monitoring system. Tasking shall assist with reducing the knowledge and skill requirement to effectively isolate failures to the lowest repairable unit and perform maintenance actions. The Contractor shall provide redesign efforts, for the Unit 2 transmitter, p/n T-1297B/SPS-49(V).</p> <p>TASKS:</p> <p>General:</p> <p>The Contractor shall coordinate and accomplish logistics/engineering activities required to establish and manage the following configuration items: Supportability Analysis Summaries, in a GEIA-STD-007 like database; Integrated Built in Test; As Built Configuration Package (built to print technical data package sufficient for third party production); Technical Design Package that provides details resulting from research and development efforts.</p> <p>The Contractor shall coordinate logistics/systems engineering activities that effect redesign of system hardware and software to meet mission support requirements, system RM&amp;A, supportability, accessibility and cost objectives. The Contractor shall use Logistics Supportability Analysis and actual RM&amp;A data from in service operation to influence design of production systems. The Contractor shall use predicted and actual data to conduct quantitative engineering tradeoff analyses.</p> <p>The Contractor shall establish and use an Integrated Product Data environment to manage logistics products. The Contractor shall provide configuration control process maps, product software and hardware diagnostics documentation, and version control methodology. These products shall enable system upgrades while reducing logistics support tasks. The Contractor shall provide and maintain as built, as delivered, and as maintained configuration lists with serial number tracking to maintenance significant items.</p> <p>Logistics Management Information (LMI):</p> <p>The Contractor shall provide logistics support services and necessary enabling technology required to develop LMI data for the Transmitter assembly in the SPS-49 (V) series radar.</p>

The Contractor shall deliver and manage electronic updates in GEIA-STD-0007 format readable by any LSA application that provides applicable error-free LSA reports. The Contractor shall manage the LMI data as a Configuration Item under their Configuration Management and Product Data Management Plans. This LMI shall serve as input to the following derivative logistics products:

- (1) Logistics Support Analysis (LSA)
- (2) Embedded technical information for operation / maintenance
- (3) Provisioning Technical Data (PTD)
- (4) Integrated Logistics Support Plan (ILSP)
- (5) Integrated BIT/Diagnostics System

Logistics Support Analysis (LSA):

The Contractor shall conduct and provide a Logistics Support Analysis (LSA) on the AN/SPS-49A (V1) Transmitter and the AN/SPS-49B Transmitter with the goal of providing design improvements to meet the objectives stated in the Weapons Specification, pertaining to system RM&A and life cycle cost objectives.

- (1) Span analysis of logistics elements to include manpower, personnel, training, reliability, and maintainability.
- (2) Incorporate LSA narratives into interim and final Integrated Logistics Support Plan chapters; e.g., parallel construct between LSA and ILSP where possible
- (3) Include RM&A, Level of Repair and Task Analyses
- (4) Include quantitative engineering tradeoff analysis to substantiate software/hardware/diagnostics design changes
- (5) Identify and document gaps in mission/system supportability, maintainability, availability manpower/training goals
- (6) Provide Findings, Recommendations and Conclusions within each logistics functional element traceable to LMI and engineering data.

Engineering Support Services:

The Contractor shall perform upgrades to the AN/SPS-49A(V)1 Transmitter (Unit 2) to enable apprentice level Navy personnel to perform maintenance of the system. The redesign efforts shall reduce the knowledge and skill requirements for system operators and maintainers. The upgrades performed by the Contractor shall reduce the logistics footprint of the AN/SPS-49A(V)1. The upgrades performed by the Contractor shall eliminate manual troubleshooting, alignments and adjustments. The Contractor shall implement BIT hardware/firmware to collect transmitter status data to enable single LRU fault detection/isolation 95% of the time a fault occurs. The Contractor shall provide all transmitter status data for extraction over a single Ethernet interface. The Contractor shall develop and provide algorithms to accomplish the fault detection/isolation requirements.

The contractor shall provide a solution that enables the transmitter to achieve a Mean Time Between Critical Failure of 60,000 hours.

The contractor shall provide a solution that enables the transmitter to meet operating and support costs per installation per year no greater than \$52,000 (per system per year).

The contractor may remove the MTBCF, and Cost numbers for the following transmitter components to perform design tasks:

1. High Voltage Power Supply (2PS2)
2. Solid State Modulators
3. Klystron

AN/SPS-49A(V)1 Transmitter upgrade efforts shall include, but not be limited to, the following assemblies:

- 2A13 Logic Control Assembly p/n G226193-3
- 2A2 Microwave RF Assembly p/n 707127-1
- 2PS1 Vac-Ion Pump Supply p/n 711061-1
- 2A15 Power Monitor
- 2A8 Current Sense Assembly p/n 713946-1
- 2A1 Distribution Box p/n 707167-1
- 2A12 Control-Indicator Panel p/n G318985-1
- 2A14 Antenna Control p/n G284082-2
- 2PS3 Low Voltage Power Supply
- 2PS4 Klystron Filament Power Supply p/n 707140-1
- Filament Resistor Network
- 2T4/2PS5 Klystron Solenoid Power Supply p/n 711808-1 and p/n 707126-1
- Fuse Panel
- Cable Harnesses

The contractor shall perform an evaluation of the transmitter functions and based upon that evaluation the contractor may remove a function that resides in the current transmitter cabinet to reside in another system cabinet upon government approval. This transfer of function shall be based upon the overall system function and best area of placement. Since this placement could remove a function from the transmitter; any work effort related to that function shall be documented and presented along with the transmitter effort.

The upgrades shall be compatible with and interface with the current redesign efforts being performed by NSWC Crane which include:

- PEO-IWS 2 Common Digital Sensor Architecture Core
- Unit 2 High Voltage Power Supply p/n 706260-1
- AN/SPS-49A(V)1 Time of Day architecture

The Contractor shall develop drawings and associated lists which provide definition sufficiently complete to enable future engineering upgrades to the transmitter and to enable a competent manufacturer to produce and maintain quality control of items delivered. The drawings developed by the Contractor shall be assigned drawing numbers provided by NSWC Crane. These drawings and lists shall be established to the degree that physical and performance characteristics, interchangeable with those of the original design, are obtained without resorting to additional product design effort, additional design data, or recourse to the original design activity. These drawings shall define all inspection points in inspection procedure numbers, reflect the end product, and provide the engineering data for the support of repair. Drawings shall include details of unique processes, i.e. not published or generally available to industry, when essential to design or repair, performance ratings, dimensional and tolerance data, critical manufacturing assembly sequences, input and output characteristics, diagrams of mechanical and electrical connections, physical characteristics (including form and finish), details of material identification, inspection, test and evaluation criteria, necessary calibration information and quality control data.

The Contractor shall conduct integration of hardware, firmware and diagnostics applications into a AN/SPS-49A(V)1 Transmitter located at NSWC Crane.

Programmatic/Program Support Services: The Contractor shall provide monthly updates on support efforts and participate in biweekly IPT and/or Working Group meetings/telephone conferences.

The Contractor shall conduct a Systems Requirements Review (SRR) on 11-12 January 2010.

	<p>The Contractor shall conduct a Preliminary Design Review (PDR) upon completion of PDR entrance criteria requirements.</p> <p>The Contractor shall conduct a Critical Design Review (CDR) upon completion of CDR entrance criteria requirements.</p> <p>The Contractor shall develop and deliver prototype units for concept demonstration and concept maturity. The Contractor shall receive prior approval from NSWC Crane in order to proceed with any prototyping efforts.</p>
Applicable Documentation	N/A
GFI, GFE, GFM	N/A
Duty Location	NSWC Crane; Chippewa Falls, WI
Temporary Duty/Travel Requirements	<p>Chippewa Falls, WI to NSWC Crane:  15 Trips, 2 people; 1 Trip/month for 2 people for 1 week/trip, 5 nights  1 Trip, 5 people, 2 nights (R01) , 1 Trip, 7 people, 2 nights  Chippewa Falls, WI to NSWC Crane: 5 Trips, 1 person, 2 nights  Chippewa Falls, WI to NRL Chesapeake, MD: 2 Trips, 2 people, 2 nights  Chippewa Falls, WI to Huntsville, AL: 2 Trips, 2 people, 4 nights  Chippewa Falls, WI to Washington, D.C., 1 Trip, 4 people, 2 nights  Chippewa Falls, WI to Seneca, SC, 1 Trip, 1 person, 6 nights  Chippewa Falls, WI to NSWC Crane: 9 Trips, 4 people, 5 days (testing)  Chippewa Falls, WI to NSWC Crane: 5 Trips, 3 people, 2 days (QPRs)  Chippewa Falls, WI to NSWC Crane: 5 Trips, 2 people, 5 days (meetings)  Chippewa Falls, WI to Chesapeake, MD: 3 Trips, 2 people, 3 days (testing/meetings)  Chippewa Falls, WI to Huntsville, AL: 3 Trips, 3 people, 3 days (meetings)  Chippewa Falls, WI to Huntsville, AL, 1 Trip, 1 Person, 5 days (Sept 2010)  Chippewa Falls, WI to Roseville, MN, 1 Trip, 5 people, 1 day (6 Oct 2010)  Chippewa Falls, WI to Huntsville, AL, 1 Trip, 2 people, 3 days (13 Oct 2010)  Chippewa Falls, WI to Washington, D.C., 1 Trip, 2 people, 4 days (7 Feb 2011)  Chippewa Falls, WI to NSWC Crane: 1 Trip, 7 people, 5 days (21 Feb 2011)</p>
SLIN Number(s)	<b>100002, A2; 100003, A3; 100005, A5; 300003, A2; 300004, A5</b>
Period of Performance	2/13/2009 through <b>6/30/2011, continuous from date of TI contingent upon award of award terms and fund availability.</b>
Data Deliverable (s)	<p>IAW Paragraph 5.0 of the basic order and all deliverables shall be submitted to <a href="mailto:amy.haworth.ctr@navy.mil">amy.haworth.ctr@navy.mil</a></p> <p>A001 Commercial drawings/models and assoc. list  A003 Conceptual design drawings/models  A004 Conference Agenda  A005 Conference Minutes  A007 Contractor's progress status and management reports  A008 Developmental design drawings/models and assoc. lists  A009 ECP  A010 Engineering Drawings  A011 GFI Deficiency Report  A013 Interface Design Document  A015 Logistics Support Analysis Record Data  A016 Presentation Material  A018 Revision to existing government documents  A019 Scientific and Technical reports  A020 Software development plan  A021 Software requirements specification  A022 Software test plan</p>

	<p>A024 Software version description  A025 Status of GFE report  A026 Technical Data package  A027 Technical report-study/services  A028 Test Plan  A029 Test Procedures</p> <p>0001A = Draft Transmitter Performance Specification (A026) Due: 16 Oct 2009</p> <p>0001B = Draft Management Schedule/Risk/Plan (A026)  Due: 16 Oct 2009</p> <p>0001C = Draft Maintainability/Logistics Support Analysis (A026)  Due: 30 Oct 2009</p> <p>0001D = Draft Interface Requirement Specification (A026) Due: 4 Dec 2009</p> <p>0001E = Draft Master Test Plan (A028)  Due: 11 Dec 2009</p> <p>0001F = Draft Configuration Management Plan (A026)  Due: 11 Dec 2009</p> <p>0001G = Updated Draft Transmitter Performance Specification (A026) Due: 11 Jun 2010</p> <p>0001H = Updated Draft Management Schedule/Risk/Plan (A026) Due: 11 Jun 2010</p> <p>0001J = Updated Draft Maintainability/Logistics Support Analysis (A026) Due: 11 Jun 2010</p> <p>0001K = Updated Draft Configuration Management Plan (A026) Due: 11 Jun 2010</p> <p>0001L = Hardware Design Documentation (A026)  Due: 11 Jun 2010</p> <p>0001M = Fault Detection/Fault Isolation Design Document (A026) Due: 11 Jun 2010</p> <p>0001N = Assembly/subassembly Build/Test/Verify Document (A029) Due: 15 April 2011</p>
Security Classification	SECRET
Hazard and Safety Information	N/A
Requiring Technical Activity (RTA)	Roy Klamm
Contracting Officer's Representative (COR)	Jerry Harrison, 812-854-3742 jerry.harrison@navy.mil

Contingent Upon Task Order Modification Issuance to Increase Funding  
 Funding is currently available on the Task Order