

ADDITION TO SECTION C :

Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR)

1.0 Introduction. The TSV C4ISR system encompasses multiple functions within the TSV systems architecture. The design of the TSV C4ISR system shall be interoperable and shall integrate multiple systems at multiple locations on the vessel to allow access and or sharing of: sensor, processing, and communications equipment over local area networks and data buses to form a C4ISR System-of-Systems, including:

- a. Commercial Communications, Electronics, and Navigation (CEN) systems as defined in the TSV Purchase Description (PD) with integrated military communications and Joint/Army Battle Command (BC) software on the bridge.
- b. Commercial and military sensor systems with navigation and self-protection system controls on the bridge.
- c. Transmission of vessel logistics information and in-transit visibility systems.
- d. Joint/Army BC and en-route mission planning and rehearsal software in a collaborative Battle Command Center (BCC).
- e. Secure and non-secure communications, voice and data, through multiple line-of-sight, non-line of sight, Ultra-High Frequency (UHF) Tactical Satellite (TACSAT), L-band Satellite Communications (SATCOM) and wideband SATCOM radios and Telephony from both the bridge and BCC.
- f. Transmission security (TRANSEC), Communication security (COMSEC), Information Security (INFOSEC) systems.
- g. Self-protection Systems

The C4ISR's architecture shall maximize automation of the C4ISR functions. The C4ISR System-of-Systems Architecture shall have the following characteristics: an open-architecture, object-oriented, modular, scalable, tailorable, portable, transportable and Joint Technical Architecture (JTA), Defense Information Infrastructure Common Operating Environment (DII-COE), Net-Centric Operational Warfare (NCOW) and SCA compliant.

Proven commercial and military technologies shall be used as a basis for the design of the Theater Support Vessel (TSV) C4ISR. The system's open design will allow the insertion of new technologies as they become available. The design must be interoperable [i.e., the ability to communicate reliably and effectively by secure and unsecured data and voice with higher, lower and adjacent units in a Joint (Army, Navy, Marine Corps, Air Force, Coast Guard) and Coalition environment]. The C4ISR system architecture will integrate both Government Furnished Equipment (GFE) and Contractor Furnished Equipment (CFE). Selected C4ISR functions must interface with the Communications Electronics and Navigation (CEN) equipment required by the TSV PD.

A two-phased approach will be utilized. Phase 1 will be the system design and development of a Performance Specification and Phase 2 will be the procurement, installation, testing and verification of the C4ISR in accordance with the performance specification.

2.0 PHASE 1 System Design. The Contractor shall conduct a comprehensive system, functional, Trade-off Analysis to support the final determination of the optimal C4ISR suite. This analysis will support both the continuous Risk Assessment (e.g. Cost, Schedule, and Performance) and all the parasitic burden budgets (i.e. space, weight, cube, power, cooling, shock, vibration, cost, etc). As part of these analyses, the contractor shall recommend changes in the SOW to the C4ISR IPT and, upon mutual agreement; these changes will be presented to the Procuring Contracting Officer (PCO). The results of this analysis will also identify those components that may become part of the Pre-Planned Product Improvement (P3I) program.

The C4ISR design for Military Requirements shall meet military technical specifications (i.e. Joint Technical Architecture (JTA), Defense Information Infrastructure Common Operating Environment (DII-COE), Net-Centric Operational Warfare (NCOW)), DoD Security/Information Assurance Regulations, TEMPEST requirements, and meet (as applicable) interoperability certification criteria of the Central Technical Support Facility (CTSF), and the Joint Interoperability Test Center (JITC). The certification will be done in Phase 2.

The contractor's system design shall comply with the space, weight, power, HVAC and other applicable requirements as set forth in the TSV PD.

2.1 Systems Requirements. The system requirements are as follows.

1. C4ISR military requirements for vessel
2. C4ISR requirements for embarked unit BCC
3. Telelogistics and Automated Identification Technology (AIT)/Movement Tracking System (MTS)
4. Self-protection systems and sensors
5. Supporting Infrastructure

The design of the C4ISR system shall be optimized to share resources where possible. Resources will not be shared if they will reduce the capability of either the crew or embarked unit capability.

2.1.1 C4ISR Military Requirements for Vessel.

2.1.1.1 Tactical Communications. The TSV shall be equipped with the following communications capabilities:

Ultra-High Frequency (UHF) SATCOM
Extremely High Frequency (EHF) SATCOM

Super-High Frequency (SHF) SATCOM
North Atlantic Treaty Organization-3 (NATO- 3)
Ultra-High Frequency (UHF) Radio (s)
Very-High Frequency (VHF) Radio (s)
High-Frequency (HF) Radios
INMARSAT V/D
Plain Old Telephone System (POTS)
Secure Telephone Equipment (STE)
Global Broadcast System (GBS)
Integrated Broadcast Service (IBS)
Global Positioning System (GPS)
Blue Force Tracker
Interrogation Friend or Foe (IFF)
Secure/Non-secure Fax

2.1.1.2 Joint Common Operational Picture (COP). The C4ISR must be designed to have on-board visibility of the Joint COP as the TSV will become a part of the Joint Common Operational Picture (COP). The BC Applications will be located in the Vessel Planning Room and also as needed, remotely accessed on the Bridge.

2.1.1.3 GFE Applications. The TSV C4ISR design shall include the following GFE applications:

- a. Selected Army Battle Command System (ABCS)
- b. Global Command and Control System – Joint (GCCS-J), Global Command and Control System - Army (GCCS-A), and Global Combat Support System – Maritime (GCCS-M)
- c. Global Combat Support System - Army (GCSS-A)
- d. Transportation Coordinators' Automated Information for Movement System (TC-AIMS)
- e. Blue Force Tracking
- f. Defense Messaging System (DMS)
- g. Standard Automated Logistics Tool Set (SALTS)

2.1.2 C4ISR Requirements for Embarked Unit BCC.

2.1.2.1 Embarked Unit Communications. The embarked unit shall have the following communication capabilities:

Ultra-Hi Frequency (UHF) SATCOM
Extremely High Frequency (EHF) SATCOM
Ultra-High Frequency (UHF) Radio (s)
Very-High Frequency (VHF) Radio (s)
High-Frequency Radio(s)
Plain Old Telephone System (POTS)
Secure Telephone Equipment (STE)

Global Broadcast System (GBS)
Integrated Broadcast Service (IBS)
INMARSAT V/D
Blue Force Tracker
Global Positioning System (GPS)
Integrated Broadcast Service (IBS)
Wireless LAN

2.1.2.2 Embarked Unit BC Applications. The TSV C4ISR design for the embarked unit shall include the following GFE applications:

GCCS-A/ Command and Control Personal Computer (C2PC)
Maneuver Control System (MCS)/MCS-Lite (L) (w Exchange, SQL)
Combat Service Support Control System (CSSCS)
Forward Area Air Defense Command, Control, Computer, Intelligence (FAADC3I)
Advanced Field Artillery Tactical Data System (AFATDS) / AFATDS-L
All Sources Analysis System (ASAS) / ASAS-L
Air and Missile Defense Work Station (AMDWS) / AMDWS-L
Collaboration Suite(s)
Enroute Mission Planning and Rehearsal (EMPR)
Blue Force Tracker
Defense Messaging System (DMS)
Information Dissemination Manager-Tactical (IDM-T)
Theater Battle Management Core System(s) (TBMCS)
Publish/Scribe Client
Encryption (INFOSEC) (Electronic Key Management System (EKMS))

2.1.2.3 Collaborative Resources. The TSV BCC shall be equipped to provide the Embarked Unit the following:

Large Screen Display (s)
Remote work station(s)/terminal(s)
Computer resources
Intercom system that accommodates:
 Voice Over Internet Protocol (VoIP)
 Multiple simultaneous conferences (single, small, large)
 Broadcast
 Public Address System
VCR/DVD/CD-R/W resources
Video teleconferencing
Fax capability (secure/non-secure)
Printers
TV/Video System.

2.1.3 Telelogistics and AIT/MTS.

2.1.3.1 Telelogistics. The TSV shall utilize the IECSS (Integrated Electronics Communication Support System) by communicating its diagnostic and prognostic anomalies to the TSV's supporting organization in order to expedite the availability of repair parts, special tools, and test equipment. The TSV crew shall be able to perform critical under way system level maintenance.

2.1.3.3 Automated Identification Technology (AIT)/Movement Tracking System (MTS) The TSV shall be equipped with AIT and MTS to provide the capability to identify, inventory and catalog the on-board cargo. In support of the DOD "factory-to-foxhole", the Common Logistics Operating Environment (CLOE) and in coordination with the MTS capability, the TSV shall be capable of receiving, by electronic means, cargo visibility data from the transferring source, evaluating and making use of the data to support its missions and passing on that data to the next gaining organization. In-transit visibility data detailing the contents and location of the vessel must be capable of being transmitted (relayed) to the Global Transportation Network (i.e. GTN 21) to support Joint Total Asset Visibility (JTAV).

2.1.4 Self-protection Systems and Sensors. The contractor shall design the C4ISR architecture to support the integration of the following self-protection system and sensors. The self-protection systems and sensors will be provided as GFE and information on these systems will be provided after contract award.

2.1.4.1 Self-Protection. The Government will provide, as GFE, a combination of small and medium caliber weapons, threat warning system and active and passive missile defense system. The TSV Self-Protection suite shall be an integrated element of the C4ISR System-of-System architecture. Control of, and all data pertaining to, the operation of the self-protection system shall be integrated within the IBS display and/or Self Protection Center. GFE will include the following:

a. Up to four stabilized small caliber gun mounts, which will be operated locally and remotely on the bridge and/or the Self-Protection Center. The mounts will be similar in size and configuration to the Mini-Typhoon mount system. The mounts will incorporate a mounted camera and Forward Looking Infra-Red (FLIR).

b. Up to 2 medium caliber gun systems will be operated locally or on the bridge and/or the Self-Protection Center. The gun system will be similar in size and configuration to the MK46 Mod 1 turret weapon system. The mounts will incorporate a mounted camera and FLIR.

c. Infra-Red / Radio Frequency / Laser Warning Receivers (IR/RF/LWR) capability. These systems are to be integrated within the bridge and/or the Self-Protection Center.

2.1.4.2 Sensors. Various sensors and systems will be provided as GFE. Information on these systems will be provided at contract award.

2.1.5 Supporting Infrastructure. The requirements for these four sections shall include design of the supporting infrastructure to include: Power, HVAC, Lighting, human factors and outfitting and furnishing of the spaces.

2.1.5.1 Local Area Networks (LAN). The TSV will be equipped with three LAN systems, Secure Internet Protocol Network (SIPRNET), Non-Secure Internet Protocol Network (NIPRNET), and Coalition Network (COLAN). These networks shall provide as a minimum the following network services: Web Access, Email, Dynamic Host Configuration, VoIP, and VTC.

2.1.5.2 Electrical Requirements. The TSV shall provide a Power Distribution System (PDS) for the entire C4ISR system. The PDS shall take raw vessel power and condition, buffer, up/down convert; have uninterruptible reserves to allow orderly shutdown.

2.1.5.3 Bus Architecture. The TSV will be provided with an appropriate Bus Architecture as required by the self-protection suite.

2.1.5.4 Outfitting and finishing of spaces. The impacted spaces will be outfitted and finished for their intended purposes.

2.1.5.5 Secure Storage. The Radio room and BCC shall be equipped with secure storage of classified material.

2.2 References.

2.2.1 General. The documents listed in this section are in addition to the documents listed in the TSV Purchase Description (PD). Any Global Information Grid (GIG) interoperability requirements or DoD Information Assurance requirements in these documents are applicable as they pertain to weapons platforms.

Clinger Cohen Act of 1996

Office of Management and Budget
OMB A-130

Management of Federal Information
Resources

DEPARTMENT OF DEFENSE
DODAF
DODM 8510.1-M

DoD Architecture Framework
Defense Information Technology Security
Certification and Accreditation Process
(DITSCAP) Application Manual

DOD 5220.22-M

National Industrial Security Program –
Operating Manual, dated January 1995

DOD 8500.1

Information Assurance

DODI 5200.40

Information Technology Security

Certification & Accreditation Program

Joint Chief of Staff (JCS)
CJCSI 3170.01C

Joint Capabilities Integration and
Development System

CJCSM 3170.01M

Joint Capabilities Integration and
Development System

CJCSI 6212.01C

Interoperability and Supportability of
Information Technology and National
Security Systems

CJCSM 6510.01

Defense In-Depth: Information Assurance
& Computer Network Defense

DEPARTMENT OF THE ARMY

AR 25-1

Information Management

AR 25-2

Information Assurance

(Copies of the above manuals can be obtained from the National Technical
Information Service, 5285 Port Royal Road, Springfield, VA 22161 (703) 321-8547).

DEPARTMENT OF THE NAVY
MANUALS AND REPORTS
IA Pub-5239-31

Information Assurance Program Guidelines,
Shipboard Red/Black Installation Guidance

CODE OF FEDERAL REGULATIONS

CFR Title 47

Tele-Communications

(Application for copies should be addressed to the Superintendent of Documents, US
Government Printing Office, Washington, DC 20402-0002.)

(Application for copies should be addressed to the Superintendent of Documents, US
Government Printing Office, Washington, DC 20402-0002.)

NATIONAL SECURITY AGENCY

NSTISSAM

TEMPEST/2-95

National Security Telecommunications and
Information Systems Security Advisory
Memorandum TEMPEST/2-95, Red/Black
Installation Guidance

(Application for copies should be addressed to the Executive Secretariat, National
Security Telecommunications and Information Systems Security Committee, National
Security Agency, Fort George G. Meade, MD 20755-6000)

2.3 Security Requirements.

The Department of Defense Contract Security Classification, DD Form 254, included in Attachment X, itemizes the security classification requirements for this contract. The work to be performed under this contract shall involve access to, and handling of, classified material up to and including Secret.

2.3.1 Contractor's facilities.

The contractor's facility shall be cleared for access of classified information up to and including Secret and authorized for storage of classified material up to and including Secret and be capable of obtaining a National Security Agency (NSA-approved) Communications Security (COMSEC) Material System (CMS) account for the receipt, issuance, and storage of COMSEC material.

2.3.2 DD Form 254 requirements.

During the performance of this contract the contractor shall be required to meet the security requirements as indicated on the DD Form 254, both in terms of project personnel for this task and provision of an appropriate work or storage facility.

3.0 Period of Performance.

The Period of Performance for this contract shall be no more than 365 days, starting from contract award. A Preliminary Design Review (PDR) (see section 5.0) shall be conducted within 90 days of completion of start of work meeting and a Critical Design Review (CDR) shall be conducted within 180 days of completion of the PDR.

4.0 Government Furnished Information (GFI)

The Government will provide at a minimum the following information: C4ISR Operational Architecture (i.e. Operational View, Systems View, Technical View, C4ISR Block Diagrams for the Battle Command Center, Radio Room, and Vessel Planning Room (as notional views)), a Work Breakdown Structure for the first through third levels, and an initial list of Government Furnished Equipment (GFE). Updates to these documents as appropriate will be provided after contract award.

5.0 Conferences/Meetings/Reviews.

5.1 C4ISR Integrated Process Team (IPT).

The Government and the contractor will co-chair a TSV C4ISR IPT. The IPT will conduct meetings. The IPT shall meet at least monthly during Phase 1. The contractor and the Government are encouraged to hold their meetings as video teleconferences whenever possible, otherwise they will be conducted at the contractor's facility. The meeting agenda shall be mutually agreed to in advance by the Government and contractor. The first meeting shall be held in conjunction with the Post Award Conference.

5.2 C4ISR Design Reviews. The contractor shall host at a minimum two formal design reviews: the Preliminary Design Review (PDR) and the Critical Design Review (CDR). These reviews will be between the contractor and the government and will be listed on the Contract Master Schedule as milestones. The contractor shall send out agenda and

documentation that will be discussed during the reviews at least two weeks prior to the review. The contractor and the Government shall mutually agreed on the agenda. The contractor shall compile, track and distribute meeting minutes.

5.2.1 Preliminary Design Review.

The Contractor shall conduct a Preliminary Design Review (PDR) with Government participation. The PDR is a review of the preliminary design of the C4ISR system. The following information shall be provided in draft form at least 10 days prior to the start of the PDR:

- C4ISR Performance Specification
- Software Requirements Specifications (SRS)
- Architectural block diagrams
- Solution set matrix
- System wiring diagrams and cable run sheets
- Cable block diagrams
- Arrangement drawings
- System/Functional Analyses results

5.2.2 Critical Design Review.

The Contractor shall conduct a Critical Design Review (CDR) with Government participation. The CDR is a review of the mature C4ISR design. At this point the C4ISR configuration and specifications should be nearly complete. The following information shall be provided at least 10 days prior to the start of the CDR:

- C4ISR Performance Specification
- Software Requirements Specifications (SRS)
- Architectural block diagrams
- Solution set matrix
- System wiring diagrams and cable run sheets
- Cable block diagrams
- Arrangement drawings
- System/Functional Analyses results

6.0 Deliverables.

The contractor shall deliver the following:

- C4ISR Performance Specification
- Software Requirements Specification (SRS)
- Contract Master Schedule
- Meeting/Briefing Materials
- Conference Minutes
- Contract Status Reporting

All unclassified data delivered or data made available, shall be in accordance with the TSV SOW. All classified data shall be handled and delivered in accordance with the

DoD 5220.22-M "National Industrial Security Program – Operating Manual, dated January 1995.

6.1 C4ISR Performance Specification.

Performance Specification shall be prepared for procurement, installation, testing, and verification of the C4ISR system for the TSV in Phase 2 (CDRL XXXX). The C4ISR system requirements relate to:

- C4ISR military requirements for vessel
- C4ISR requirements for embarked unit BCC
- Special Mission Requirements
- Integration of self-protection systems and sensors
- Supporting Infrastructure

The C4ISR system performance specification shall maximize integration of systems, self-diagnostics and embedded training where this will effectively reduce manning and total cost of ownership and increase availability. The crew skill level and makeup will be considered in the development of the performance specification. The performance specification shall define size, weight, power and HVAC requirements.

The performance specification will be based on sections 2.0 up to 2.2 of this document

6.1.1 **Verification requirements.** The performance specification shall include verification requirements for the C4ISR system.

6.2 **Software Requirements Specification (SRS) for system management and execution.** The contractor shall develop and maintain the Software Requirements Specification. The SRS shall define and record the software requirements for each software item, methods used to meet requirements and traceability between software item requirements and system requirements. The SRS shall define all Applications Program Interfaces (API) (CDRL ***).

6.3 Project Planning Chart.

The contractor shall furnish a Project Planning Chart in accordance with CDRL XXXX. The CMS shall at minimum cover weekly phone conferences, meetings, design reviews, delivery schedule and major engineering milestones. The Government and contractor shall use it to monitor progress during the contract and to plan for and manage contract activities.

6.4 **Meeting/Briefing Materials.** Meetings shall include the following: Start of Work, Conferences (phone/VTC), and Design Reviews. Data shall be provided as required for each meeting, in accordance with CDRL XXXX.

6.5 Meeting Minutes.

The contractor shall deliver meeting minutes within five working days from the conclusion of all meetings (phone/VTC conferences, Design Reviews) in accordance with **CDRL XXXX**. The meeting minutes will include at a minimum the following: Agenda, Attendance List (Name, Company, Phone number, Email address), discussion points, decisions made, and action items.

6.6 Contractor's Progress, Status and Management Report.

The contractor shall provide monthly Contract Status Reports (CSRs) in accordance with **CDRL XXXX**

7.0 Proposal for Phase 2. At the completion of Phase 1 the contractor will develop a proposal for the execution of Phase 2. This proposal will include drawings, engineering documentation, procurement, installation, testing, verification.