

1 **PROGRAM EXECUTIVE OFFICE COMMAND, CONTROL,**
2 **COMMUNICATIONS, COMPUTERS, & INTELLIGENCE**
3 **(PEO C4I), SHIP INTEGRATION PROGRAM OFFICE,**
4 **PMW 760**

5
6 **C4I ENGINEERING, INTEGRATION, AND INSTALLATION**
7 **CONTRACT (CEnIIC)**

8
9 **29 December 2016**



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20 **PERFORMANCE WORK STATEMENT**
21 **FINAL DRAFT**
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1.0 INTRODUCTION

Program Executive Office for Command, Control, Communications, Computers, and Intelligence (PEO C4I) is responsible for Maritime Platform Engineering, Integration, and Production Execution requirements. This contract will encompass logistics, integration, engineering, procurement, fabrication, assembly, test, inspection, and installation of integrated C4I and related capabilities aboard new construction ships. The Contractor shall improve platform performance and reduce total costs to the Government by implementing a “total systems engineering management approach” to shipboard C4I integrated systems design, production, testing, and shipboard integration support, as described in this contract Performance Work Statement (PWS).

1.1 Background This contract will support various Navy and other United States Government shipbuilding programs. These programs require integrated C4I capabilities to provide robust communications for operations, maritime, and flight safety. These programs also require integrated information from various communications links and sensors. The integrated capabilities will provide a given command or ship an extension of the tactical horizon, and provide threat indications and warnings. These capabilities will also provide tactical threat analysis and the capability to target the indicated threat entities. The integrated capability is made up of distributed systems that provide network capabilities, communications, command and control, and intelligence. The System of Systems (SoS) Test and Integration Facility (TIF) Complex is located at Space and Naval Warfare Systems Command (SPAWAR) Systems Center–Atlantic (SSC–LANT) in Charleston, SC.

1.2 Scope This contract is to provide support for the following anticipated shipbuilding programs: small deck amphibious, combatants, auxiliary, and special mission ships. Specific tasking will be identified in each Task Order (TO).

1.2.1 Places of Performance The principal place of performance of the contract is Charleston, SC, and the anticipated shipyards are in: Mobile, AL; San Diego, CA; Bath, ME, Pascagoula, MS; Norfolk, VA; and Marinette, WI.

1.2.2 Facilities and Operations The Contractor shall maintain sufficient facilities for the performance of this contract within a 25-mile radius of the SSC–LANT TIF Complex in Charleston, SC, and at designated shipyard locations as required and approved by the Government. The Contractor’s permanent support facility shall be ready for use no later than forty-five (45) days after contract award. The facility must be capable of meeting security requirements for storage and safeguarding of classified information up to the SECRET level. The Contractor shall perform platform TIF integration at the Government TIF Complex. The Contractor shall provide/lease utility carts, and shall provide/lease office, and/or storage space to support normal operations and emergency evacuation for Program personnel and material near shipyard facilities.

1.2.3 Industrial/Warehousing Facility The Government will provide industrial/warehousing space in Charleston, SC, to accommodate storage of the electronic equipment and material required in performance of this contract. In the event that Government warehousing space has been exceeded or is unavailable, the Contractor shall have the ability to store equipment within a 25-mile radius of the TIF Complex and/or shipyard locations. The Contractor shall provide/lease office and/or storage space at designated shipyard locations as required and approved by the Government to support normal operations and emergency evacuation for Program personnel and material near shipyard facilities. Additional warehouse space may be required due to the recent change from traditional delivery to the shipbuilder’s warehouse to just-in-time delivery directly to the ship.

1.2.4 Tasking Specific tasking may include but is not limited to:

- Calibration of Equipment
- Communications Security
- Configuration Management
- Crew Support and Familiarization
- Design Engineering
- Facilities
- Human Systems Integration
- Industrial/Warehousing Facility
- Installation, and Platform Familiarization

- 1 • Integrated C4I Test Development & Support
- 2 • Integration Engineering
- 3 • Management Plan
- 4 • Manufacturing, Production, and Fabrication Process Development/Maintenance
- 5 • Manufacturing Engineering; Manufacturing Readiness
- 6 • Material Management
- 7 • Packaging, Handling, Storage, and Transportation
- 8 • Platform C4I Testing
- 9 • Platform Execution Plan
- 10 • Platform Logistics Support
- 11 • Platform Ship Compartment Build-up Integration and Test within the TIF Complex
- 12 • Platform Systems Engineering
- 13 • Post Trials Discrepancy Correction
- 14 • Product Testing & Support
- 15 • Production/Integration
- 16 • Quality Control and Quality Assurance
- 17 • Rack Integration/Assembly
- 18 • Repair of Material Items
- 19 • Resource Planning
- 20 • Ship Post Delivery Support
- 21 • Shipyard/Shipboard Installation/Support
- 22 • Shipboard Equipment Installation
- 23 • Shock and Vibe Testing
- 24 • Systems Engineering
- 25 • Systems Packing and Transportation
- 26 • Trials Support

27
28 **1.3 Security** The nature of this task requires some Contractor personnel with clearances sufficient to allow access to
29 data and information up to Secret, and on a limited basis Top Secret (TS) with access to Sensitive Compartmented
30 Information (SCI). Office and storage facilities must be cleared to the level of Secret. The Government anticipates
31 TS/SCI cleared personnel will be needed beginning 180 Days After Contract Award.

32
33 **1.3.1 Communications Security** The Contractor shall be certified to handle Communications Security (COMSEC)
34 Information up to the Secret level at the TIF Complex and up to the TS SCI level during shipboard production,
35 integration and testing efforts, ensuring chain of custody of all classified material. The Contractor shall coordinate
36 with the local Crypto Management System (CMS), Electronic Key Management System (EKMS), and/or Key
37 Management Infrastructure (KMI) custodian to obtain COMSEC material and shall conduct periodic inventories as
38 required by applicable COMSEC regulations, maintain a CMS User Access List approved by the EKMS Manager,
39 issue Controlled Cryptographic Item (CCI) and load and test Key material, and schedule yearly user training.

40
41 **1.3.2 Operations Security** All work is to be performed in accordance with Department of Defense (DoD) and Navy
42 Operations Security (OPSEC) requirements and in accordance with the OPSEC attachment to the DD254.

43
44 **1.3.3 Cybersecurity** Cybersecurity (which replaced the term Information Assurance (IA)) is defined as prevention
45 of damage to, protection of, and restoration of computers, electronic communications systems, electronic
46 communications services, wire communication, and electronic communication, including information contained
47 therein, to ensure its availability, integrity, authentication, confidentiality, and nonrepudiation. Contractor personnel
48 shall perform tasks to ensure Navy applications, systems, and networks satisfy Federal/DoD/Department of the
49 Navy (DON)/Navy cybersecurity requirements.

50 51 **2.0 APPLICABLE DOCUMENTS**

52 Reference documents are identified in the applicable technical and management requirement statements. The latest
53 revision in force at the time of TO award will be applicable unless otherwise specified. The Contractor may identify

1 and propose alternative commercial specifications and standards where applicable at the time of execution. The
 2 Government will review and approve prior to acceptance and implementation.
 3

Document	Title	PWS Location
DODAF (SV)-1	Department of Defense Architecture Framework Internal System View	3.1.5
ABS NVR	American Bureau of Shipbuilding Naval Vessel Rule	3.2.1 3.2.5.5 3.2.5.6 3.2.5.7
ASME Y14.5	American Society of Mechanical Engineers Standard Y14.5 Dimensioning and Tolerancing Standard	3.2.5.2 3.2.6
MIL-D-23140D	Military Specification: Drawings, Installation Control, for Electronic Equipment	3.2.5.4 3.2.5.6
DoD-STD-20034A	Department of Defense Standard Practice: Electric Plant Installation Standard Methods for Surface Ships and Submarines (Cableways)	3.2.5.5
NSTISSAM TEMPEST/2-95	Red/Black Installation Guidance	3.2.5.5 3.2.6.4
IA PUB-5239-31	Department of the Navy Information Assurance Module: Information Assurance Shipboard Red/Black Installation Publication	3.2.5.5 3.2.6.4
DoD-STD-2003-3	Department of Defense Standard Practice: Electric Plant Installation Standard Methods for Surface Ships And Submarines (Penetrations)	3.2.5.5
MIL-STD-2003A	Department of Defense Standard Practice: Electric Plant Installation Standard Methods for Surface Ships and Submarines	3.2.5.6 3.2.6.6
S9086-KC-STM-010/CH-300R8	Naval Ships' Technical Manual (NSTM) 300 Electric Plant – General	3.2.5.7
MIL-STD-1399C	Military Standard: Interface Standard For Shipboard Systems	3.2.5.7
IEEE STD 45	Institute of Electrical and Electronics Engineers (IEEE) Recommended Practice for Electrical Installations on Shipboard	3.2.5.7
MIL-STD-882E	Department of Defense Standard Practice: System Safety	3.2.6.4
DoD-STD-2106 (NAVY)	Department of Defense Design Criteria: Development of Shipboard Industrial Test Procedures	3.2.6.7 3.4.2
DoD Instruction 5000.02	Operation of the Defense Acquisition System	3.2.12
Defense Acquisition Guidebook	Chapter 6 – Humans Systems Integration (HSI)	3.2.12
MIL-STD-46855A	Department of Defense Standard Practice: Human Engineering Requirements for Military Systems, Equipment, and Facilities	3.2.12.1
ASTM F1337	Standard Practice for Human Engineering Program Requirements for Ships and Marine Systems, Equipment, and Facilities	3.2.12.1
ASTM F1166	Standard Practice for Human Engineering Design for Marine Systems, Equipment, and Facilities	3.2.12.1
MIL-STD-1472G	Department of Defense Design Criteria Standard: Human Engineering	3.2.12.1
NAVSEA Standard Items	NAVSEA Standard Items	3.2.12.2
29 CFR Part 1915	Occupational Safety and Health Standards for Shipyard Equipment	3.2.12.2

Document	Title	PWS Location
MIL-STD-2003-1A	Department of Defense Standard Practice: Electric Plant Installation, Standard Methods for Surface Ships and Submarines (Cable)	3.2.12.2
MIL-STD-2003-2A	Department of Defense Standard Practice: Electric Plant Installation, Standard Methods for Surface Ships and Submarines (Equipment)	3.2.12.2
MIL-STD-2003-5A	Department of Defense Standard Practice: Electric Plant Installation, Standard Methods for Surface Ships and Submarines (Connectors)	3.2.12.2
COMLTFORCOMINST 4790.3	Joint Fleet Maintenance Manual	3.2.12.2
SECNAVINST 5100.16 B	Navy Gas Free Engineer Certification/Recertification	3.2.12.2
NAVSEA S9AA0-AB-GSO-1010	General Specs for Overhaul of Surface Ships (GSO)	3.2.12.2
SPAWARINST 4720.5	SPAWAR Installation Requirements Drawings Standard	3.2.12.2
NAVSEA SE000-00-EIM-100	Electronics Installation and Maintenance Book, General	3.2.12.2
NAVSEA S9074.AQ-GIB-010/248	Requirements for Welding and Brazing Procedure and Performance Qualification	3.2.12.2
MIL-HDBK-454B	Department of Defense Handbook: General Guidelines for Electronic Equipment	3.2.12.2
MIL-STD-1310H	Department of Defense Standard Practice: Shipboard Bonding, Grounding, and other Techniques for Electromagnetic Compatibility, Electromagnetic Pulse (EMP) Mitigation, and Safety	3.2.12.2
MIL-S-901D	Military Specification: Shock Tests. H.I. (High-Impact) Shipboard Machinery, Equipment, and Systems, Requirements For	3.2.12.3 3.4.7
MIL-STD-167-1A	Department of Defense Test Method Standard: Mechanical Vibrations of Shipboard Equipment (Type I - Environmental and Type II - Internally Excited)	3.2.12.3
MIL-STD-188-125-1	Military Standard: High-Altitude Electromagnetic Pulse (HEMP) Protection for Ground-Based C4I Facilities Performing Critical, Time-Urgent Missions Part 1 Fixed Facilities	3.2.12.3
MIL-STD-188-125-2	Military Standard - High-Altitude Electromagnetic Pulse (HEMP) Protection for Ground-Based C4I Facilities Performing Critical, Time-Urgent Missions - Part 2 - Transportable Systems	3.2.12.3
DODI 8500.01	Department of Defense Instruction – Cybersecurity, 14 March 2014	3.2.13
DON CIO Memorandum	Department of the Navy Chief Information Officer Memorandum – Acceptable Use of Department of the Navy Information Technology, 12 February 2016	3.2.13
MIL-HDBK-61A	Military Handbook – Configuration Management Guidance	3.3.6
NAVSEA S9095-AD-TRQ-010/TSTP	Total Ship Test Program Manual	3.4.3
ANSI/NCSL Z540-3	Requirements for the Calibration of Measuring and Test Equipment	3.4.6.1
ISO 9001	Quality Management System	3.4.6.1
SPAWARSYSCENLANTI NST 2280.1	Communications Security Material System (COMSEC) and Electronic Key Management System (EKMS) Material and Equipment Guidance	3.5.2.h

Document	Title	PWS Location
SECNAVINST 5510.30	Department of the Navy Personnel Security Program (PSP) Instructions	3.5.2.h
NAVSEA Technical Specification (TS) 9090.310	Alterations to Ships Accomplished by Alteration Installation Teams	3.5.7 4.2.1 4.2.2
DoDD 8140.01	Department of Defense Directive – Cyberspace Workforce Management, 11 August 2015	4.1.11
DoD 8570.01-M	Department of Defense Information Assurance Workforce Improvement Program, 19 December 2005	4.1.11 4.1.11.1
SECNAVINST 4239.20A	Department of the Navy Cyberspace Information Technology and Cybersecurity Workforce Management and Qualification, 11 Feb 2016	4.1.11
SECNAV M-5239.2	Department of the Navy Information Assurance Workforce Management Manual, May 2009	4.1.11
ISO 9000	International Standards Organization	4.2
GEIA-STD-0007	Logistics Product Data	4.3.1
DoDI 4161.02	Department of Defense Instruction: Accountability and Management of Government Contract Property	4.4
DoDI 5000.64	Department of Defense Instruction: Accountability and Management of DoD Equipment and Other Accountable Property	4.4
DoDI 4140.67	Department of Defense Instruction: Counterfeit Prevention Policy	4.4
SECNAVINST 4440.34	Implementation of Item Unique Identification Within the Department of the Navy	4.4.1
MIL-STD-2073-1(E)1	Department of Defense Standard Practice for Military Packaging	4.5.1
MIL-PRF-55585G	Performance Specification: Electronics Equipment and Parts, Packaging Of	4.5.1
MIL-STD-129	Military Marking for Shipment and Storage	4.5.1
MIL-PRF-8726A	Performance Specification: Manuals, Interactive Electronic Technical-General Content, Style, Format, and User-Interaction Requirements	4.6

1

2 **3.0 TECHNICAL REQUIREMENTS**

3 **3.1 Systems Engineering** The Contractor shall provide Systems Engineering to include systems engineering
4 management, design, and specifications management. The C4I SoS includes but is not limited to: Program of Record
5 (POR) and non POR Surveillance and Reconnaissance systems, interfaces to external systems, and other support
6 equipment.

7

8 **3.1.1 Systems Engineering Management Plan (SEMP)** The Contractor SEMP shall be available to the Government
9 upon request, and the Contractor shall notify the Government when updates have been made.

10

11 **3.1.2 Verification Methods for Requirements** The Contractor shall assign verification methods to each allocated
12 requirement, including Analysis, Inspection, Similarity, Demonstration, and Test.

13

14 **3.1.3 C4I SoS Product Breakdown Structure (PBS)** The Contractor shall synthesize a PBS that defines the
15 hardware-based hierarchy of the C4I SoS. The PBS shall define the C4I SoS top-down breakdown by Extended
16 Shipboard Work Breakdown Structure (ESWBS) code, subsystems, PORs, e.g., (Government-provided, fully
17 integrated racks), and nomenclature equipment. The PBS provides the Government and Contractor the hardware-
18 based structure and parts hierarchy necessary to establish configuration identification and control of the C4I SoS.
19 The PBS also provides the Government and Contractor a convenient graphical breakdown view of the C4I SoS
20 against which work can be organized. (Contract Data Requirements List [CDRL] A004)

1
2 3.1.4 Specifications The Contractor shall create a specifications tree that defines the relationships among the
3 specifications required for the project and references the platform's Work Breakdown Structure (WBS). The
4 Contractor shall create Performance, System, Subsystem, Configuration Item Performance, and Configuration Item
5 Procurement specifications as required. (CDRL A004)

6
7 3.1.5 Functional Interface Diagram (FID) The Contractor shall create and/or modify a FID derived from the
8 platform's Department of Defense Architecture Framework (DoDAF) Internal System View (SV)-1. The FID shall
9 show the systems comprising the C4I SoS and the interfaces connecting them, and shall be organized in a
10 Government-provided FID format. (CDRL A005)

11
12 3.1.6 Specialty Engineering The Contractor shall perform specialty engineering studies as required. These studies
13 may include: Reliability, Maintainability, and Availability assessments, Environmental Electromagnetic Effects
14 assessments, modeling and simulation testing, engineering design recommendations, feasibility studies, white
15 papers, and systems safety and hazards assessments. (CDRL A016)

16
17 **3.2 Design Engineering** Using Government Furnished Information (GFI), (e.g., Installation Requirements
18 Drawings (IRDs), Installation Control Drawings (ICDs), architecture views, ship specifications, FIDs) the
19 Contractor shall provide engineering and technical support services in the area of C4I Platform design to include
20 performing engineering analyses and evaluations to generate an optimal and achievable platform system
21 configuration baseline (CDRL A004). The Contractor shall translate the requirements identified, defined,
22 decomposed, and allocated by the systems engineering process into documents and drawings that provide technical
23 direction and specifications to procure, fabricate, assemble, integrate, and install the C4I SoS aboard the designated
24 platform.

25
26 3.2.1 Design Requirements (DR) Baseline The primary mechanism used to control design activities shall be the DR
27 Baseline. The DR Baseline shall be accessible to personnel conducting design engineering activities and to the
28 Government. The DR Baseline shall list associated ICDs, IRDs, ship contract and guidance drawings, shipbuilding
29 specification change notices, ship and system specifications or equivalent American Bureau of Shipbuilding Naval
30 Vessel Rules (ABS NVR), operations and maintenance manuals, Systems User Guides (SUGs), System
31 Administrators Guides (SAGs), Engineering Direction Memoranda (EDM), and other design inputs and their
32 revisions in effect, authorized for use in design development. The Contractor shall maintain the DR Baseline using
33 the configuration management processes described in paragraph 3.3.

34
35 3.2.2 Impact Assessment (IA) The Contractor shall prepare and submit IAs with recommendations and guidance
36 concerning Government-proposed changes or tasking that is beyond the original scope of the TO. The IAs shall
37 provide a quantified assessment of expected impacts to design documents, drawings, data, cost, schedule, and
38 performance, as well as detailed implementation procedures and an implementation timeframe. (CDRL A016)

39
40 3.2.3 Design Decision Matrix The Contractor shall deliver a design decision matrix to support integration efforts,
41 including relevant source data, and shall be maintained throughout the scope of this PWS. The design decision
42 matrix shall include a listing of design decisions, the date on which they were made, and the identity of the
43 individual entering the data. The design decision matrix shall be used to maintain Space, Weight, and Power (SWaP)
44 /Heating, Ventilation, and Air Conditioning (HVAC) data, and these data shall be maintained and organized at the
45 compartment, envelope, cabinet, and equipment levels of indenture. Values for the following design budget
46 parameters shall be maintained: weight, center of gravity, dimensions (including sway space), heat to air, heat to
47 water (if applicable), air flow rate, temperature rise, whether a direct ventilation return is required, the number of
48 electrical leads per cabinet/equipment, the type of power per cabinet/equipment, the load per phase, the in-rush load,
49 the power panel characteristics and loads, fusible link values, and breaker sizes. The SWaP/HVAC data shall also
50 include design budget and actual values of data provided for inter-compartment cables and cableways. The design
51 decision matrix shall be flexible and expandable to incorporate needed additional design parameters. The design
52 decision matrix shall provide a summary report of margins available in both absolute values and percentages for
53 each contractual design budget value. The design decision matrix shall be used to compare against values
54 established by the shipbuilder and to identify potential issues. (CDRL A016)

1 3.2.3.1 *Design Inputs* The Contractor shall populate the design decision matrix with parametric data obtained from
2 ICDs or IRDs, contract specifications, and other technical data sources for the systems and equipment comprising
3 the C4I SoS and any additional required non-C4I systems and any new capabilities and equipment necessitated by
4 additional requirements. Data populated in the design decision matrix shall be based upon source documentation that
5 has been formally authorized for use as design inputs. Because the Contractor will sometimes have to work with and
6 base early GFI contractual deliverables upon immature design inputs prior to preliminary ICDs/IRDs being issued,
7 the Contractor shall work directly with the technical design agents for those systems to ensure that the preliminary
8 design data available are accurate, consistent, and reasonable and that the system's design will be compatible with
9 planned integration approaches on a given ship program. The Contractor shall review and provide reports (CDRL
10 A016) documenting comments and recommendations on ICDs/IRDs and other documents used as design inputs. The
11 Contractor shall annotate and redline ICDs/IRDs and other documents used for design inputs to correct
12 discrepancies and provide clarifications before issuing them for design use.
13

14 3.2.4 Preliminary and Contract Design Support The Contractor shall provide technical support to shipbuilding
15 programs prior to release of a Request for Proposal (RFP) for shipbuilding detail design, construction, test and trials
16 contract, or preliminary design contracts. This support shall encompass aspects of ship design development
17 preceding release of the shipbuilding RFP, including developing schedule, content, and format requirements for
18 developing preliminary arrangement models at the ship, compartment, and work area levels; parametric estimates of
19 SWAP/HVAC characteristics of the C4I SoS; review, mark-up, and input to specifications to be used in the RFP;
20 development of preliminary equipment lists derived from Systems Engineering input; providing input to contract
21 drawings; and developing project-specific documents.
22

23 3.2.5 C4I SoS GFI The Contractor shall develop and provide documents, drawings, and data required to support
24 concurrent detail design and construction of the ship. The Contractor shall define, develop, review, update, and
25 deliver revised GFI necessary for the Shipbuilder to use in design and construction of C4I spaces, and in the
26 effective integration of the C4I SoS and subsystems into the platform. (CDRL A016)
27

28 3.2.5.1 *Product Specifications* The Contractor shall develop, review, update, and deliver new and/or existing drafts
29 of GFI product specifications that define the detailed content and format of GFI products based upon definitions
30 previously negotiated and documented in project-specific documents and the platform's Schedule C. These
31 specifications shall reflect the basic design budget and turnkey execution approach that have been established for
32 that ship or ship class.
33

34 3.2.5.2 *GFI Products* The Contractor shall develop draft GFI products described in paragraphs 3.2.5.3 to 3.2.6.6 in
35 accordance with (IAW) the GFI Product Specifications, ASME Y14.5: Dimensioning and Tolerancing Standard,
36 and approval authority requirements.
37

38 3.2.5.3 *Arrangement Design* The Contractor shall develop, review, update, and deliver arrangement drawings that
39 depict the relevant aspects of arrangement design required by the shipbuilder at various times during detail design
40 and construction. These deliverables shall include: arrangement drawings of key C4I spaces depicting arrangement
41 of space envelopes; fully integrated Government Furnished Equipment (GFE); Contractor Furnished Equipment
42 (CFE); Outfitting and Furnishing (O&F) items; and the incorporation of cableway reservations, ventilation ducting,
43 and other key structural obstructions. These products shall consider information from official shipbuilder drawings
44 such as general arrangement, compartment and access, and scantling drawings. (CDRL A014)
45

46 3.2.5.4 *Foundation Design* The Contractor shall develop, review, update, and deliver GFI products that provide
47 Outline and Mounting (O&M) drawings for each individually mountable item. The O&M drawing shall identify the
48 physical outline, weight, center of gravity, mounting interfaces, flatness requirements, and material characteristics of
49 each individually mountable item. The O&M drawings shall comply with MIL-D-23140D: Drawings, Installation
50 Control, for Electronic Equipment, or the relevant IRDs/ICDs, less any detail not required to specify the O&M
51 configuration. (CDRL A014)
52

53 3.2.5.5 *Platform Cableway Design* The Contractor shall develop, review, update, and deliver GFI products that
54 specify requirements for cableways through which cabling associated with C4I SoS or other required systems
55 equipment must be pulled and installed. These requirements shall be specified for both local and main cableways
56 and shall indicate the routing plan for systems' cabling into and out of the cableways. Cableway design shall comply

1 with the requirements of Section 304 of the respective shipbuilding specifications, or equivalent ABS NVR. General
2 cableway design shall also comply with DoD-STD-2003-4: Electric Plant Installation Standard Methods for Surface
3 Ships and Submarines (Cableways), Section 4 of 5 Sections. Cableway design shall comply with NSTISSAM
4 TEMPEST/2-95A: Red/Black Installation Guidance and IA PUB 5239-31: Information Assurance Shipboard
5 Red/Black Installation. Penetrations shall comply with DoD-STD-2003-3. (CDRL A014)

6
7 *3.2.5.6 Platform Connectivity Design* The Contractor shall ensure interoperability of interfaces between internal
8 and external systems. The Contractor shall develop and provide GFI products that specify the connectivity of the
9 C4I SoS. The connectivity design shall be based upon inputs from: the approved FID; C4I SoS system or equipment
10 ICD/IRD Cable Block Diagrams (CBDs); C4I SoS system or equipment Cable Run Sheets (CRSs); and shipbuilding
11 contract system drawings. Connectivity GFI products shall include Inter-Compartment Cable Lists (ICL), CBDs,
12 and CRSs. Format and content of CBDs and CRSs shall comply with MIL-D-23140D: Drawings, Installation
13 Control, for Electronic Equipment; IRD/ICD; or requirements of the applicable shipbuilding contract, whichever has
14 precedence. The Contractor may propose alternate formats of these products to save costs and implement those
15 formats if approved by the Government and the respective NAVSEA Ship Program Manager (SPM) and
16 shipbuilder. Cables and connectors shall be constructed per MIL-STD-2003A. Cables and connector hardware shall
17 comply with Section 302 of the respective shipbuilding specifications or equivalent ABS NVR. (CDRL A014)

18
19 *3.2.5.7 Power Distribution Design* The Contractor shall develop, review, update, and deliver power distribution
20 GFI products for the C4I SoS or other required non-C4I systems. These products shall consist of single-line
21 distribution drawings that specify power leads and associated sources for the C4I SoS. The power distribution design
22 shall be based upon the power requirements of the C4I SoS equipment, the shipbuilder's single line power
23 distribution drawings showing distribution from load centers to distribution panels, and Sections 300, 314, and 324
24 of the respective shipbuilding specifications or equivalent ABS NVR. General power distribution guidance shall be
25 from S9086-KC-STM-010/CH-300 Naval Ships' Technical Manual, Chapter 300 Electric Plant General; MIL-STD-
26 1399C: Interface Standard For Shipboard Systems, Section 300A, Electric Power, Alternating Current (Metric);
27 IEEE Std 45: IEEE Recommended Practice for Electric Installations on Shipboard; or equivalent commercial
28 specifications. (CDRL A014)

29
30 *3.2.5.8 Cooling Design* The Contractor shall develop, review, update, and deliver GFI products that specify the
31 heat dissipation characteristics of C4I SoS equipment. In conjunction with Arrangement of Envelopes and O&M
32 drawings, these products shall specify the locations and dimensions of forced air exhausts or cooling water
33 interfaces, cooling medium flow rates and quality levels, the magnitude of heat to be dissipated, and whether a direct
34 ventilation return is required for each forced air exhaust. (CDRL A014)

35
36 *3.2.5.9 Topside Design* The Contractor shall develop, review, update, and deliver Outline and Installation (O&I)
37 drawings as GFI for antennas and other C4I SoS equipment that is mounted topside. These drawings shall consist of
38 the O&I drawings from the respective antenna system ICDs/IRDs and shall be redlined as required to delete
39 superfluous information not pertinent to the installation or variant being installed. In cases in which O&I drawings
40 for antenna or other topside equipment do not exist, the Contractor shall develop the drawings. (CDRL A014)

41
42 *3.2.5.10 Top-Down Breakdown (TDBD)* The Contractor shall develop, review, update, and deliver GFI that
43 specifies the TDBD of the C4I SoS. The TDBD data shall provide an indented listing of items comprising the C4I
44 SoS. The Contractor shall provide the TDBD in formats and sort orders that provide the basis for functional
45 grouping, material identification, tracking, receipt, and shipboard location as required by each individual
46 shipbuilder. (CDRL A013)

47
48 *3.2.5.11 As-Built Drawings* The Contractor shall develop, review, update, and deliver As-Built drawings of the C4I
49 SoS to be used as selected record drawings. These drawings shall consist of O&I drawings obtained from the
50 ICDs/IRDs for POR systems, O&I drawings developed by the Contractor for non-POR (including Contractor-
51 provided, Contractor-integrated) cabinets and method mounted items, Cable Block Diagrams by system, Cable Run
52 Sheets, and Compartment Arrangement of Equipment drawings for each key C4I space. The Contractor shall
53 develop and deliver As-Built drawings as specified in the ship specifications. The format and content of these
54 drawings may be identical to previously submitted detailed GFI products or they may be reformatted to better suit
55 use by the ship's force depending upon each program's requirements. (CDRL A014)

56

1 3.2.6 TIF Design Products The Contractor shall develop and provide documents, drawings, and data required to
2 fully integrate subsystems of the C4I SoS, and those documents required to support concurrent detail design and
3 construction of the ship. The Contractor shall design full-scale, individual platform TIFs for C4I equipment.
4 Individual platform TIFs are defined as “mock-ups” of the platform-specific shipboard environment and are
5 components of the overall TIF as delineated below. Products shall conform to ASME Y14.5: Dimensioning and
6 Tolerancing Standard. (CDRL A005)

7
8 *3.2.6.1 Overall Facility Design* The Contractor shall develop, maintain, and deliver Government-approved plans
9 and drawings in the approved format that specify the overall configuration and use of the production, integration,
10 test, and storage facilities to which they have been assigned. These products shall address arrangement of individual
11 platform TIFs, material storage areas, material flow, office areas, and other areas to be used by the Contractor within
12 the facility. These products shall also specify facility power distribution from facility power skids to the distribution
13 panels within each individual platform TIF. The Government will approve and compile all plans and drawings and
14 maintain an overall configuration plan for the TIF to include overall TIF layout, power distribution, antenna
15 location, and network and phone drops. (CDRL A005)

16
17 *3.2.6.2 Individual Platform TIF Arrangement Design* The Contractor shall develop, review, update, and deliver
18 platform TIF layout drawings that specify the configurations of the walls, accesses, flooring, cableways, O&F items,
19 CFE, and non-POR GFE to be mocked up in the platform TIF. The structural configurations and features of the
20 individual compartments and accesses shall replicate those of the ship design to the highest degree practical within
21 cost constraints. The arrangement configuration shall be based upon the same ship drawings upon which the
22 arrangement GFI drawings are based. The Contractor shall validate the shipbuilder’s design to support the
23 integration of the C4I suite. The Contractor shall develop power distribution drawings that specify the
24 configurations of power distribution to distribution panels within the individual platform TIFs. (CDRL A005)

25
26 *3.2.6.3 TIF Cableway Design* The Contractor shall develop, review, update, and deliver detailed cableway plans
27 and cable routing for each cable that will be built and delivered to the ship for installation. The cable routing shall
28 determine the required cable length and remain within the constraints of the ship’s cableway structure and the
29 parameters specified in GFI. Cableway design shall also include TIF-specific cables that will not be delivered, such
30 as inter-compartment cables that would be built and installed by the shipbuilder, but are necessary for testing of the
31 C4I SoS within the platform TIF. (CDRL A005)

32
33 *3.2.6.4 Cabinet Integration Design* The Contractor shall develop, review, update, and deliver designs and issue
34 drawings for production use that specify the configuration of C4I SoS cabinets that are not part of POR systems.
35 These Contractor-developed cabinet designs may include components from POR systems as well as non-POR
36 systems. Examples of cabinet designs may include systems such as Tactical Variant Switch (TVS), Crypto, Extra-
37 High Frequency TDMA Interface Processor (EHF TIP), and others needed to support the integration of a C4I suite
38 of equipment onto a particular ship. Cabinet integration designs shall comply with HSI requirements to include
39 MIL-STD-882E: Department of Defense (DoD) Standard Practice for System Safety. Cabinet integration designs
40 shall also comply with requirements of NSTISSAM TEMPEST/2-95A: Red/Black Installation Guidance; and IA
41 PUB 5239-31: Information Assurance Shipboard Red/Black Installation. (CDRL A014)

42
43 *3.2.6.5 TIF Connectivity Design* The Contractor shall develop, review, update, and deliver the TIF Build packages
44 (cable block diagrams, cable running sheets, Work Instructions, and O&I drawings) to detail the connectivity
45 requirements of the various subsystems to be integrated at the platform TIF. The products shall provide sufficient
46 detail to support production, fabrication, and integration of associated components, and will show any changes made
47 during the integration efforts to the connectivity requirements of those subsystems. The Contractor shall notify the
48 Government of any required changes and obtain written approval from the Government prior to incorporating them
49 into the drawings. The Contractor shall incorporate all approved red-line changes into the final drawing packages.
50 (CDRL A014)

51
52 *3.2.6.6 Miscellaneous Hardware Design* The Contractor shall develop, review, update, and deliver fabrication
53 detail drawings for any component that must be custom fabricated. Such items may include mounting adapters,
54 custom rack installation kits, connector panels, component enclosures, or cable running sheets for outsourced cable
55 assemblies. Cables and connectors shall be designed and built as specified in the Task Order. (CDRL A014)

56

1 3.2.6.7 *Equipment Received at the TIF Complex and Shipyards* The Contractor shall perform visual inspection for
2 damage during acceptance of POR or major non-POR equipment at the TIF Complex and Shipyards. Additionally,
3 the Contractor shall perform an in-depth Material Receipt Report (MRR) within five (5) working days of receipt and
4 prior to storage, which validates the physical equipment with the latest drawings. For any discrepancies noted
5 between the physical equipment and the drawings, the Contractor will generate a Material Discrepancy Report
6 (MDR) for each discrepancy noted during the MRR process. Receipt Inspection (Stage 1), and Installation
7 Inspections and Tests (Stage 2) or as noted in individual product specifications. Tests should be performed IAW
8 DoD-STD-2106 (NAVY). Items with discrepancies shall be identified to the Government Project Lead (PL) to
9 determine further action. (CDRL A017)

10
11 3.2.7 Bills of Material (BOM) The Contractor shall develop, review, update, and deliver in MS Excel format,
12 BOMs that support and track required purchasing and production/integration for each C4I SoS. Required fields in
13 the BOM shall include, but are not limited to, Manufacturer Cage and Part Number, National Stock Number (NSN)
14 and COG (if applicable), Unit Of Issue, quantity ordered, Description, Navy Nomenclature, Configuration Item
15 number, Purchase Order number, vendor, Estimated Delivery Date, Contract Number and TO the material was
16 procured under. In addition, it will include a reference source for the procurement, i.e. DWG and item number on
17 the list of material, to also include fabricated material, calibration of test equipment, Change Notice or ECR number,
18 etc. The BOMs may include Open Purchase Material, CCI Material, items purchased via Military Interdepartmental
19 Purchase Request (MIPR), NSN materials, and items used for mounting of CCI materials. (CDRL A009)

20
21 3.2.8 Engineering Change Documents The Contractor shall review engineering change documents (e.g.,
22 Preliminary Engineering Change Proposals [PECPs], Engineering Change Proposals [ECPs], Engineering Change
23 Requests [ECRs], Ship Change Documents [SCDs]) submitted by Government entities or other systems integrators
24 for potential impact on the design and integration of the C4I SoS. The Contractor shall develop a report detailing
25 impacts on design, cost and schedule as part of CDRL A006 and provide the Government recommendations for the
26 approval or rejection of each document, considering the current state of progress of design and integration activities.
27 Upon approval of each document, the Contractor shall incorporate changes into the C4I baselines as directed by the
28 Government. The Contractor shall develop revisions to previously-delivered GFI and submit them to the
29 Government for subsequent delivery. Changes to released documents shall be incorporated in accordance with the
30 Configuration Management (CM) procedures used by the NAVSEA SPM. The Contractor shall prepare
31 documentation to include ECPs (CDRL A006) and Notices of Revision (NORs) (CDRL A007), resulting from either
32 internally- or externally-driven changes to specify any changes required to the shipbuilding contract baseline,
33 including previously delivered GFI. Upon Government approval of the changes, the Contractor shall prepare a
34 Specification Change Notice (SCN) (CDRL A008).

35
36 3.2.9 Design Changes and Feasibility Validations The Contractor shall design changes to implement solutions,
37 technical improvements, and mandated system upgrades as well as develop or review design change proposal
38 documentation and feasibility validations. The Contractor shall identify capability gaps, design and develop solution
39 alternatives, and perform feasibility studies to support the selection of the appropriate design change proposal. The
40 Contractor shall assist the Government in reviewing other proposed changes or feasibility studies and make
41 recommendations with respect to the potential impacts to platform integration. (CDRL A016)

42
43 3.2.10 C4I SoS Products The Contractor shall support the identification and resolution of potential and actual
44 problems associated with the C4I system products. Throughout the course of integration design, material receipt,
45 platform TIF integration, and shipboard installation and testing, if deficiencies are noted with any equipment or
46 components of the C4I SoS that have been furnished by a PEO C4I POR the Contractor shall assist the Government
47 in the reporting and resolution of these deficiencies. The Contractor shall prepare MDRs as referenced in paragraph
48 4.4.2 and shall assist the Government in the further troubleshooting and resolution of these issues. If the resolution
49 requires baseline changes, the Contractor shall submit Baseline Change Requests as described in paragraph 3.3.2.

50
51 3.2.11 Limited Life Items The Contractor shall determine which systems contain components that would be
52 damaged by storage in an unpowered state, such as uninterruptable power supplies, and shall take measures to
53 preserve remaining life and otherwise avoid damage to the components.

54
55 3.2.12 Human Systems Integration (HSI) The Contractor shall apply HSI principles to systems engineering tasks to
56 optimize total system performance, minimize total ownership costs, and ensure that the non-POR systems are built

1 to accommodate the characteristics of the user population that will operate, maintain, and support the system as
2 required by DoD Instruction 5000.02 and the Defense Acquisition Guidebook, Chapter 6.

3
4 *3.2.12.1 Human Factors* The Contractor shall include Human Factors Engineering (HFE) and the guidelines of
5 MIL-STD-46855A: Human Engineering Requirements for Military Systems, Equipment, and Facilities; ASTM
6 F1337: Standard Practice for Human Engineering Program Requirements for Ships and Marine Systems,
7 Equipment, and Facilities; ASTM F1166: Standard Practice for Human Engineering Design for Marine Systems,
8 Equipment, and Facilities; and MIL-STD-1472G: DoD Design Criteria Standard, Human Engineering, where they
9 apply in the C4I SoS design. The Contractor shall take steps to ensure ergonomics, HFE, and cognitive engineering
10 are employed during design of systems engineering to provide for effective human-machine interfaces and to meet
11 HSI requirements. C4I SoS design shall minimize or eliminate system characteristics that require excessive
12 cognitive, physical, or sensory skills; entail extensive training or workload-intensive tasks; or produce safety or
13 health hazards for effective human-machine interfaces. HFE shall be an agenda item in engineering design reviews.
14

15 *3.2.12.2 Safety and Occupational Health* The contractor is solely responsible for compliance with the Occupational
16 Safety and Health Act (OSHA) Public Law 91-596 and the resulting standards, OSHA Standard 29 CFR 1910
17 (general), 1915 (shipboard) and 1926 (shore) and for the protection, safety, and health of their employees and any
18 subcontractors assigned to the respective task orders under this contract. Contractor personnel shall be familiar with
19 and shall follow all applicable safety guidance including applicable NAVSEA Standard Items. The Contractor shall
20 ensure that appropriate HSI and Environment, Safety and Occupational Health (ESOH) efforts are integrated across
21 disciplines and into systems engineering to determine system design characteristics that can minimize the risks of
22 acute or chronic illness, disability, or death or injury to operators and maintainers; and enhance job performance and
23 productivity of the personnel who operate, maintain, or support the system. The Contractor shall analyze and report
24 to the Government any shipboard C4I ESOH hazards, including issues regarding equipment electrical safety (MIL-
25 HDBK-454B: General Guidelines for Electronic Equipment), bonding and grounding criteria for shipboard systems
26 (MIL-STD-1310H: Shipboard Bonding, Grounding, and other Techniques for Electromagnetic Compatibility,
27 Electromagnetic Pulse [EMP] Mitigation, and Safety), and Hazards of Electromagnetic Radiation to Personnel
28 (HERP) for the C4I SoS. (CDRL A010)
29

30 *3.2.12.3 Personnel Survivability* The Contractor shall provide C4I survivability analyses and studies to the
31 Government and shall include C4I system survivability in the selection of equipment and in C4I SoS design. The
32 Contractor shall ensure that C4I system equipment is designed to ensure crew survivability in hostile environments
33 in accordance with MIL-S-901D, MIL-STD-167-1A, and other hazardous effects such as High-Altitude
34 Electromagnetic Pulse (HEMP) in accordance with MIL-STD-188-125 parts 1 and 2, and natural effects such as
35 lightning. (CDRL A010)
36

37 3.2.13 Cybersecurity Design, Integration, Configuration or Installation of Hardware and Software The contractor
38 shall ensure any equipment/system installed or integrated into Navy platforms will meet the cybersecurity
39 requirements as specified under DoDI 8500.01. The contractor shall ensure that any design change, integration
40 change, configuration change, or installation of hardware and software is in accordance with established
41 DoD/DON/Navy cyber directives and does not violate the terms and conditions of the accreditation/authorization
42 issued by the appropriate Accreditation/Authorization official. Contractors that access Navy Information
43 Technology (IT) are also required to follow the provisions contained in DON CIO Memorandum: Acceptable Use
44 of Department of the Navy Information Technology (IT) dtd 12 Feb 16. Use of blacklisted software is specifically
45 prohibited and only software that is registered in DON Application and Database Management System (DADMS)
46 and is Functional Area Manager (FAM) approved can be used. Procurement and installation of software governed
47 by DON Enterprise License Agreements (ELAs) such as Microsoft, Oracle, Cisco, Axway, Symantec, ActivIdentity,
48 VMware, Red Hat, NetApp, and EMC shall be in accordance with DON CIO Policy and DON ELAs awarded.
49

50 **3.3 Configuration Management (CM)** The Contractor shall identify and utilize Configuration Management
51 practices that are documented in an approved Configuration Management Plan (CMP) consistent with the functions
52 and principles as listed in the PEO C4I Policy for Configuration Management, its associated Life Cycle
53 Configuration Management Implementation Manual, and the PMW 760 Platform Integration and CMP.
54 Participation by the Contractor's CM personnel at the Government's Configuration Control Boards (CCB) may be
55 required.
56

1 3.3.1 Platform Configuration Identification For non-POR equipment, the Contractor shall develop and maintain
2 Configuration Baselines (Functional, Allocated, and Product) to provide identification of configuration items such
3 as: documentation, data, services, processes, hardware, software, and firmware. The Contractor shall prepare
4 required functional, allocated, and product-specific configuration baselines to include a complete listing of technical
5 documentation, physical and logical configuration items, and any change requests defining the authorized
6 configuration of the Government equipment/system's functional and physical characteristics. The Contractor shall
7 generate a Platform baseline report that lists the current configuration, including both POR and non-POR equipment
8 identified for the specific platform baseline. (CDRL A004)
9

10 3.3.2 Platform Baseline Change Documentation At the direction of the Government, the Contractor shall develop
11 change documentation to effect design changes that impact the platform baseline and its associated POR and non-
12 POR C4I products through integration and implementation that have been approved by the Government. The
13 Contractor shall prepare detailed technical data packages (TDPs) in support of Government engineering change
14 documents (e.g., PECPs, ECPs, ECRs, SCDs, etc.) as required for the revised platform baseline and the relevant
15 documents and/or drawings. The Contractor shall review and address comments on each draft change document,
16 ensuring that the scope of the change is addressed appropriately and that the nature of the change is technically
17 valid. The Contractor shall obtain the necessary Government approvals as required to authorize the change and shall
18 post the draft and final approved change documents. (CDRL A016)
19

20 3.3.3 Platform As-Built Configuration List The Contractor shall develop and maintain As-Built documentation to
21 identify specific individual configuration items delivered under the contract. The Contractor shall remain in
22 compliance with contractual hardware and software configuration requirements specific to each individual platform
23 delivered under the contract. (CDRL A022)
24

25 3.3.4 Platform Configuration Status Accounting The Contractor shall establish a reliable source of configuration
26 information to support program/project activities including program management, systems engineering,
27 manufacturing, software maintenance, logistics support, modification, maintenance, decommissioning and disposal.
28 The Contractor shall establish and maintain a Configuration Status Accounting (CSA) database, which represents
29 the configuration of the Platform Baseline. Platform baselines and changes shall be documented in the Contractor's
30 CSA database. The Contractor shall permit acceptance of commercial product information in the CSA database.
31 (CDRL A021)
32

33 3.3.5 Platform Configuration Documentation The Contractor shall implement an internal configuration
34 management system for the control of platform baseline configuration documentation, physical media, physical parts
35 and software/firmware representing or comprising the platform baseline. For software, the system shall address the
36 evolving configuration and support environments (engineering, integration, and test) used to develop, integrate, and
37 test the platform baseline. CM shall be defined consistently with POR hardware and software identified for the
38 platform baseline. For TIF Task Orders, results of functional and physical configuration audits shall be accurately
39 recorded and reported as part of the Platform TIF Completion Report (CDRL A019). For Shipboard Task Orders,
40 results of functional and physical configuration audits shall be accurately recorded and reported as part of the
41 Platform Shipboard Completion Report (CDRL A020).
42

43 3.3.6 Platform Configuration Verification The Contractor shall track both the initial configuration provided by the
44 Government of the platform baseline (including POR and non-POR items), and the incorporation of approved
45 changes, to ensure that the item meets its performance and documented configuration requirements. The
46 Government and Contractor shall conduct the audit jointly with the Government chairing the audit. The Contractor
47 shall verify that: documentation reflects the "As-Built" configuration of newly developed non-POR equipment or
48 modified POR equipment within the platform baseline; accurate form, fit, function information is provided on
49 control documents for non-developmental or commercial off-the-shelf items; and confirm that documentation
50 accurately represents the "As-Built" production configuration. The Contractor shall assist the Government in the
51 development of the audits, using the guidelines contained in MIL-HDBK-61A. The Contractor shall document the
52 results of each audit and shall correct audit discrepancies documented in the configuration audit reports. In the event
53 the Government finds/concurs with evidence that the drawings or documents do not adequately represent the item,
54 integration shall cease until discrepancies are corrected and the Government approves the configuration audit
55 summary report. (CDRL A021)
56

1 3.3.7 Technical Data Package (TDP) The Contractor shall maintain a configuration management system for the
2 control of configuration documentation, physical media, and physical parts representing or comprising the Platform
3 Baseline for every new construction platform. The Contractor shall support the Government in the definition and
4 delivery of the platform final TDP IAW CDRL A014. The TDP will be used to document the Platform Baseline, and
5 shall consist, at a minimum, of a final drawing package to include: current FID, Main Cable Routing diagrams,
6 O&M Method of Mounted Equipment, Cabinet O&I, Cable Block Diagrams (Intra- & Inter- Cabinet/Compartment),
7 IRDs with Cable Run Sheets, Connector Panel fabrication drawings, Integrated Logistics Support (ILS) Checklist,
8 Space Arrangement Drawings, Topside O&I Drawings, Label Plate Drawings, Logical Network Diagrams, Work
9 Instructions, and SWAP/HVAC allocations by compartments.

10
11 **3.4 TIF and Shipboard Testing and Documentation** The Contractor shall develop, conduct, and document TIF
12 and shipboard testing IAW the Total Ship Test Plan to ensure equipment and systems successfully meet
13 requirements prior to Government acceptance.

14
15 3.4.1 Platform Test Plans The Contractor shall provide input to a Platform Test Plan (CDRL A011) compatible
16 with the platform's Total Ship Test Plan or other applicable specifications, such as a Shock Test Plan in accordance
17 with NAVSEAINST 9072.2A. The Test Plan shall contain test planning and coordination documents such as an
18 Integrated Platform Test Schedule for both TIF testing and shipboard testing, which shall be incorporated into the
19 Integrated Master Schedule (IMS); Test Readiness Reviews (TRRs) with entrance and exit criteria in accordance
20 with the DoD Acquisition Guidebook and other references determined by the Government; a Platform Test Index;
21 and a Platform Test Sequence Network. The Test Plan shall outline the Contractor's method for configuration
22 control over testing documents. The Government will review and approve all test plans prior to acceptance and
23 implementation.

24
25 3.4.2 Test Procedures The Contractor shall develop a Platform Test Procedure based on GFI provided with C4I
26 systems IAW the Total Ship Test Plan. The Contractor shall develop, review, and modify Test Procedures suitable
27 for TIF and shipboard testing (CDRL A011) in accordance with DoD-STD-2106 (NAVY): Development of
28 Shipboard Industrial Test Procedures; Command, Control, Communications, Computers, Intelligence, Surveillance,
29 and Reconnaissance (C4ISR) Interoperability Test Process; or other applicable specifications. The Contractor shall
30 notify the Government and request approval before any modification/rewrite of C4I Test Procedures (GFI) is
31 performed prior to shipboard testing phase as scheduled on the IMS. The Contractor shall obtain the relevant
32 reference material, research the system functions and capabilities, develop testing methods and detailed testing steps,
33 and develop a verification record, including expected results and tolerances for each testing step, to be used to
34 record actual results of testing. The Contractor shall validate the draft test procedures and data sheets through trials
35 conducted with the actual equipment to be tested in the TIF and onboard the ship/craft. The Contractor shall make
36 adjustments to the test procedures based on the findings of the validation efforts. The Government will review and
37 approve any proposed adjustments prior to acceptance and implementation.

38
39 3.4.3 Testing Documents The Contractor shall update and maintain testing documents in accordance with change
40 management processes described in the Platform Test Plan. (CDRL A011) The contractor shall perform test analysis
41 and document test results. The Contractor shall accept, investigate, respond to, and take action upon external test
42 discrepancy reports (i.e., Test Problem Report and Resolution [TPRR] forms) from a platform Total Ship Test
43 Program, as described in NAVSEA S9095-AD-TRQ-010/TSTP: Total Ship Test Program Manual. (CDRL A016)

44
45 3.4.4 TIF Testing and System Demonstration The Contractor shall conduct equipment and system testing in the
46 TIF Complex according to the Platform Test Plan. The Contractor shall validate the approved test procedures and
47 data sheets through trial conduct prior to demonstration of the test procedures. The Contractor shall complete
48 Receipt Inspection (Stage 1) within thirty days of receipt of equipment at the TIF, Installation Inspections and Tests
49 (Stage 2), Equipment Tests (Stage 3), Intrasystem Tests (Stage 4), Intersystem Tests (Stage 5), Special Tests (Stage
50 6), and Trials Tests (Stage 7) to the maximum extent possible as determined by the constraints of the Platform and
51 the TIF. For each test, the Contractor shall obtain the necessary test equipment and keying material, set-up and
52 groom the equipment, coordinate services and test participants, and perform the test and demonstrate the system for
53 a designated Government witness. Actual results shall be recorded in the data recording sheets of the test procedure,
54 as well as any exceptions to the procedure or expected results. (CDRL A017)

55

1 3.4.5 Shipboard Testing The Contractor shall conduct shipboard equipment and system testing in accordance with
2 the Platform Test Plan in any of the following enclaves: UNCLAS, GENSER SECRET, TS/SCI and SECRET
3 Releasable. The Contractor shall participate in a TRR prior to the official start of testing. For those test procedures
4 not completed in the TIF Complex, the Contractor shall validate the draft test procedures and data sheets through
5 trial conduct prior to demonstration of the test procedures. The Contractor shall complete Installation Inspections
6 and Tests (Stage 2), Equipment Tests (Stage 3), Intrasystem Tests (Stage 4), Intersystem Tests (Stage 5), Special
7 Tests (Stage 6), and Trials Tests (Stage 7) as required by the platform. For each test, the Contractor shall ensure
8 availability and obtain the necessary test equipment and keying material, set-up and groom the equipment,
9 coordinate services and test participants, and perform the test for a designated Government witness. Actual results
10 shall be recorded in the data recording sheets of the test procedure, as well as any exceptions to the procedure or
11 expected results (CDRL A017). The Contractor shall also provide support for shipboard C4I and other related
12 systems testing and demonstrations, such as System Operational Verification Test (SOVT), operational testing, ship
13 trials, sail-away, and readiness testing.

14
15 3.4.6 Test Equipment The Contractor shall provide necessary and requisite General Purpose Electronic Test
16 Equipment to complete TIF and shipboard testing. The Government may provide Government test equipment to the
17 Contractor when required and if available from the Government pool of test equipment. The Contractor shall
18 oversee the protection, storage, and use of Government test equipment in their possession. Missing or unaccounted
19 for Government test equipment shall be reported to the Government Project Lead within three (3) working days after
20 all efforts to locate the missing equipment have been exhausted. The Contractor shall be responsible to ship test
21 equipment to and from remote installation sites that are required by the platform; and facilitate test equipment
22 resource allocation, such as need schedules and availability forecasts. The Contractor shall submit data records and
23 transactions for inclusion entry into the test equipment database of calibration activities. The Contractor shall assess
24 and provide to the Government the cost benefits, if any, of purchasing or leasing advanced test equipment. The
25 Contractor shall submit a consolidated list of all Government owned test equipment required for the
26 testing/troubleshooting period no later than one month prior to the need date (CDRL A017). The list shall include at
27 a minimum, the Sub-Category (SCAT) code, nomenclature or description, part number and beginning/ending need
28 dates required. A complete list of Government test equipment available for check out is available via the SSC LANT
29 Intelink site.

30
31 3.4.6.1 Test Equipment Calibration The Contractor shall provide calibrated test equipment in support of scheduled
32 test events. Test equipment shall be calibrated by a company that has an accreditation certificate with a valid
33 certificate number and in accordance with ISO 9001 & ANSI/NCSLZ540-3. The Contractor shall not, under any
34 circumstances, use test equipment that requires calibration and the calibration date has expired, at any remote site or
35 within any lab space. Contractor provided test equipment shall be tracked, maintained, and calibrated by the
36 Contractor. Government Test equipment that requires calibration shall be returned to the Government with a Test
37 Equipment Calibration Request Form (CDRL A017) five (5) working days prior to calibration expiration; the
38 Government will be responsible to have the test equipment calibrated. If requested, the Contractor shall calibrate
39 Government test equipment.

40
41 3.4.7 Environmental Testing The contractor shall generate test plans, perform modeling and simulation, and
42 execute light, medium and heavyweight testing in accordance with MIL-STD-901D for equipment that is not
43 certified at the appropriate grade and approved by NSWC-CD. For equipment unable to be certified, the contractor
44 shall generate shock test discrepancy plans. (CDRL A010) The Contractor shall execute testing IAW MIL-STD-
45 901D for all components in accordance with the Government-approved plan at the designated testing facility. The
46 Contractor shall perform test analysis and document test results IAW NSWC-CD requirements. The Contractor shall
47 prepare and submit test results and recommendations for approval to the Government. The contractor shall provide
48 input and/or prepare Shock Deficiency Correction Plans (SDCPs) (CDRL A011) when required. At the direction of
49 the Government, the Contractor shall fully restore any equipment that sustains damage during the course of testing.

50
51 **3.5 Production/Integration** The Contractor shall fully maintain detailed TIF schedules to complete integration and
52 testing, integrate C4I systems at the TIF Complex and/or the shipyard, maintain the systems during testing, and
53 prepare systems for delivery and shipboard integration/testing using approved GFI. (CDRL A024)

54
55 3.5.1 Production Management The Contractor shall:

- 1 a. Plan and manage production and integration activities for multiple simultaneous platform integration
- 2 projects;
- 3 b. Prepare schedule data for production and integration activities for inclusion into the IMS, and submit
- 4 updates;
- 5 c. Prepare standard operating procedures for production and integration activities;
- 6 d. Prepare workmanship standards for minimum acceptable production quality levels; and
- 7 e. Prepare, develop, and deliver TIF implementation plans (CDRL A012) for individual platform TIFs. The
- 8 plans shall identify organizations and responsibilities involved in TIF operations, association with
- 9 engineering data, material management, testing milestones, and program constraints leading to delivery
- 10 date and provide an overall production IMS.

11
12 3.5.2 Platform TIF The Contractor shall:

- 13 a. Integrate and test the platform C4I SoS at the TIF facility located at SSC-LANT in Charleston, SC, based
- 14 upon Government-approved drawings;
- 15 b. Develop, construct, erect, and modify as needed simulated bulkheads in the TIF Complex to accurately
- 16 represent the interior dimensions aboard the ship;
- 17 c. Construct, erect, and modify as needed cableways in the TIF Complex to accurately represent the shipboard
- 18 cableway paths and available volume. The Contractor shall also mock-up beams, beam penetration sizes,
- 19 HVAC ducting interferences, and other applicable physical characteristics to the extent that they constrain
- 20 cable routing;
- 21 d. Construct, install, and modify as needed a power distribution network inside the TIF Complex to simulate
- 22 the power distribution system aboard the ship. The Contractor shall recommend and co-ordinate facility
- 23 modifications with Government facility managers (Public Works);
- 24 e. Construct, install, and modify as needed simulated equipment foundations for equipment cabinets,
- 25 workstations, consoles, desks, tables, fiddleboards, and other relevant shipboard structure to accurately
- 26 represent the user environment inside the shipboard compartments;
- 27 f. Construct and erect antenna mounting foundations, platforms, and supports for those antennas to be tested
- 28 at the TIF Complex;
- 29 g. Ensure that work accomplished in places of performance referenced in paragraph 1.2.1 above is compliant
- 30 with applicable Occupational Safety and Health Administration (OSHA) regulations and has the proper
- 31 provisions for a safe workspace; and
- 32 h. Remain compliant with electronic key management directives, including but not limited to KMI and
- 33 EKMS. The Contractor shall also remain in compliance with SPAWARSCENLANT INST 2280.1
- 34 series and SECNAVINST 5510.30 series.

35
36 3.5.3 Equipment Integration The Contractor shall:

- 37 a. Prepare and integrate C4I equipment;
- 38 b. Fabricate/build equipment, cabling, ancillary hardware, interface units, test fixtures and other required
- 39 items not available from other sources or provided by the Government;
- 40 c. Perform pre-production and production activities, including fabrication of: inter-/intra-cabinet cables,
- 41 inter-/intra-compartment cables, and unique cabling in accordance with Government-approved applicable
- 42 standards;
- 43 d. Build integrated assemblies, assemble components inside equipment cabinets, and build test fixtures,
- 44 interface boxes, test cables, and other items required for C4I testing;
- 45 e. Perform integration activities to include mounting and securing equipment, installing interconnecting
- 46 hardware, installing interconnecting cabling, dressing, and stowing cables to assure sufficient length prior
- 47 to final termination in accordance with applicable standards;
- 48 f. Perform Quality Control checks IAW Government-approved check procedures and work instructions as
- 49 referenced in 4.2.1; and
- 50 g. Perform TIF integration activities in support of multiple platforms, such as installation of antennas and
- 51 Radio Frequency (RF) switching equipment for access by multiple Platform TIFs, assembly and set up of
- 52 special test fixtures of authorized cryptographic material IAW KMI (or latest applicable key management
- 53 document).

54
55 3.5.4 Equipment in the TIF Complex and Onboard Ship/Craft The Contractor shall keep all C4I equipment

56 maintained to the original specifications through all testing, SOVT, ship trials, and sail-away to support test and

1 demonstration events unless directed by the Government. The Contractor shall notify the Government of
2 recommended or discovered changes to equipment or systems specifications prior to taking any action and for
3 guidance.

4
5 3.5.5 Preparation of Systems for Delivery The Contractor shall prepare systems and equipment for shipboard
6 delivery, to include disassembly from the Platform TIF, removal of CCI and other equipment not amenable to long-
7 term storage, preparation for packing, and marking IAW both Government and receiving shipyard identification
8 numbers.

9
10 3.5.6 TIF Completion Report The Contractor shall provide a completion report at the conclusion of the Platform
11 TIF integration and testing effort IAW CDRL A019 that identifies any incomplete testing, the remaining/outstanding
12 test procedures, production items, Change Requests/Change Notices (CR/CNs), Engineering Change Orders
13 (ECOs), and Test Change Proposals (TCPs). The Contractor shall provide explanations for any incomplete testing
14 and installations. Upon completion and shipment of the TIF systems to the shipbuilder, the Contractor shall clean the
15 TIF space and inventory all remaining material and equipment. At a minimum, the report shall include:

- 16 • Technical Issues – including MDR status
- 17 • Planned/Completion Installation – including Rack status
- 18 • Test Status
- 19 • Familiarization and ILS Package
- 20 • Delivered/Undelivered Items – including TIF Invoice and Inventory Receipt Form (TIIRF) Reports
- 21 • Open Items, Requirements need for follow-on TO

22 3.5.7 Integration, Installation, and Test Support The Contractor shall provide installation planning, installation
23 preparation, system installation or support, technical support, evaluation reporting, trials support, and pre- and post-
24 sea trials support at the designated installation site. The Contractor shall conform to NAVSEA TS9090.310E as
25 required.

26
27 3.5.7.1 Installation Plan The Contractor shall develop an installation plan that includes schedule, handling
28 guidance, equipment, and materials to be loaded and installed in the TIF and on the ship.

29
30 3.5.7.2 Installation and Testing Support The Contractor shall provide technical and engineering support for system
31 installation and light-off, grooming of systems, and conduct of required tests.

32
33 3.5.7.3 Shipyard Liaison The Contractor shall provide support to installing activities, facilitate termination of intra-
34 /inter-compartment cabling IAW applicable guidance documentation, specifications, and approved cable block
35 diagrams and cable run sheets, monitor the load-out, installation, grounding, and bonding of equipment racks, and
36 monitor the effort of connecting cables to applicable C4I systems and interfaces. The Contractor shall design,
37 fabricate, and install rack foundations and sway braces and install inter-/intra-compartment cabling.

38
39 3.5.7.4 Systems Installation The contractor shall provide personnel to install both POR and non-POR C4I systems
40 in any of the following enclaves: UNCLAS, GENSER SECRET, TS/SCI and SECRET Releasable. On select hulls
41 the contractor shall be prepared to install required infrastructure including but not limited to: install inter- and intra-
42 compartment cables; reconfigure spaces as required including backing structures; and design and install HVAC,
43 power, lighting and cableways as required to support key C4I space design. The contractor shall land and bond
44 racks, antennas, and other equipment in support of the C4I SoS. The contractor shall, on select hulls, fully finish
45 spaces to include lighting, lagging, painting, decking and other work as required to deliver a fully operable space in
46 accordance with specifications and applicable standards.

47
48 3.5.7.5 Space Turnover Support The Contractor shall provide assistance to the Government in conducting an
49 inspection of the C4I and other select spaces to determine their readiness for installation and to document
50 discrepancies. The Contractor, upon acceptance of space custody IAW a Memorandum of Agreement (MOA)
51 provided by the Government, shall provide inventory control of C4I and related systems.

52
53 3.5.7.6 Trials Support The Contractor shall provide technical, engineering, and logistics personnel in support of
54 pre-trial, Builders Trials, Acceptance Trials, and post-trial discrepancy (i.e., trial card) correction. The Contractor
55 shall assist in developing a Communications Plan (COMM Plan). The contractor shall assist, or be responsible for

1 developing and submitting the Satellite Access Request (SAR), developing a Gateway Access Request (GAR),
2 developing the Schedule of Events (SOE), and developing a Communications Watch Bill, access to SIPRnet will be
3 required.

4
5 *3.5.7.7 Post-Sea Trials Support* The Contractor shall provide technical, production, engineering, and logistics
6 personnel in support of equipment repair after delivery of the platform to the Government.

7
8 3.5.8 Shipboard Integration Completion Report The Contractor shall provide a Shipboard Integration Completion
9 report at the conclusion of ship delivery that identifies the remaining/outstanding test procedures, production items,
10 CR/CNs, trial cards, ECOs, and TCPs. The Contractor shall provide explanations for any incomplete testing and
11 installations (CDRL A020). The Government and the Contractor shall agree to the contents of this report at or prior
12 to ship delivery. At a minimum the report shall include:

- 13 • Technical Issues – including MDR status
- 14 • Planned/Completed Installation – including Rack status
- 15 • Test Status
- 16 • Familiarization and ILS Package
- 17 • Delivered/Undelivered Items – including TIIRF Reports
- 18 • Trial Card Status
- 19 • Sparing
- 20 • Work Discrepancy Report (WDR) status
- 21 • Open Items, Requirements needed for follow-on TO

22 **4.0 MANAGEMENT REQUIREMENTS**

23 **4.1 Task Order Management** The Contractor shall execute TOs, including defining, sequencing, and managing
24 activities, resources, budget and schedule, and shall staff the workforce to efficiently and effectively coordinate and
25 execute contract tasking. The Contractor shall employ industry standard concepts to ensure process efficiency. The
26 Contractor shall develop and manage a WBS IAW CDRL A002, implement configuration management principles,
27 and conduct closure activities for each TO. The Contractor shall coordinate responses to emergent requirements and
28 facilitate timely action and resolution.

29
30 4.1.1 Platform Execution Plan The Contractor shall develop, maintain, deliver, and implement a Government-
31 approved Platform Execution Plan that provides a thorough understanding of the C4I and other required systems’
32 integration efforts required for a specific class of ship or individual hull. The Platform Execution Plan shall describe
33 in detail organizational roles and responsibilities, the design budget approach, any necessary platform-specific
34 programmatic and technical information, including Government Furnished Property (GFP) delivery dates. (CDRL
35 A012)

36
37 4.1.2 Meeting and Trip Reports The Contractor shall attend meetings as directed by the Government. If
38 discussions are held at the SCI level, the Contractor may be required to attend such meetings, VTCs, etc. Additional
39 responsibilities may include: coordinate meetings, develop agendas, provide presentation inputs, and track action
40 items. The Contractor shall provide trip reports as directed by the Government. (CDRL A025, A026)

41
42 4.1.3 Integrated Master Schedule (IMS) The Contractor shall develop, maintain, provide to the Government and
43 execute tasking in accordance with an IMS tailored to each platform. The IMS will provide for resource
44 management in order to: complete requirements analysis, parametric development, shipboard installation, and
45 integration and testing; review and update specifications and drawings; integrate C4I systems at the Platform TIF;
46 maintain the systems during testing; support Dock Trials and Builder’s Trials; prepare systems for delivery and
47 shipboard installation and testing. The IMS will include SOVTs and scheduled SME groom/test periods for all
48 systems and support the Ship Post Delivery efforts in order to meet scheduled milestones. The IMS shall be
49 delivered in Government-approved format so both the Contractor and Government can identify, coordinate, and
50 implement changes necessary for desired results by ensuring each IMS is appropriately structured and used in
51 conjunction with systems engineering principles, integrated scheduling, and risk management. The Contractor shall
52 obtain written approval from the Government for the original submittal and proposed subsequent changes to the
53 IMS. Each Platform IMS will enable PMW 760 to identify and assess actual project progress against planned
54 progress; monitor critical path and near critical path; and assess program maturity. (CDRL A023)

1
2 4.1.4 Cost Management The Contractor shall develop and provide cost performance reports for each active TO
3 IAW the Contractor's Progress, Status, and Management Report (CPSMR) (CDRL A001) and the Funds and Man-
4 Hours Expenditure Report (CDRL A002), including monthly and cumulative costs by Sub-contract Line Item
5 Number (SLIN), progress summary, action items, successes, and challenges. The Contractor shall perform cost
6 management including cost estimating, budgeting costs, minimization of travel and per diem, and implementing cost
7 control at the desired level stated in the TO. The Contractor shall provide a Contract Funds Status Report IAW
8 CDRL A003.
9

10 4.1.4.1 Baseline Schedule Review (BSR) The Contractor shall schedule and hold a BSR as part of the first
11 scheduled Platform Review after TO award to assess the performance measurement baseline. The objectives of this
12 review are listed below.

- 13 a. The Contractor shall substantiate the existence of program baselines:
- 14 1) Demonstrate the effective configuration management of documents that adequately reflect the
15 Government requirements, clearly define the design and approach, and identify hardware and software
16 configurations and the integration thereof;
 - 17 2) Produce, maintain, and provide an IMS that shows dependencies and critical path IAW CDRL A023;
18 and
 - 19 3) Produce, maintain, and provide a time-phased cost management baseline that is in place and reflects
20 the baseline schedules and plans.
- 21 b. The Contractor shall produce, maintain, and provide a complete and consistent cost, schedule, and
22 performance program capable of maintaining accurate and timely cost and schedule status.
- 23 c. The Contractor shall demonstrate adequacy of program and technical management plans and controls.
- 24 d. The Contractor shall demonstrate its management teams' understanding of program risks and mitigation
25 plans.
26

27 4.1.4.2 Integrated Program Management Report (IPMR) The Contractor shall provide cost performance reports
28 IAW CDRL A018. The IPMR shall include one or more of the following reports:

- 29 a. Estimate At Completion (EAC)
30 b. Percent expended on the task with applicable dollar rates annotated
31 c. Percent remaining with applicable dollar rates annotated
32 d. Cost Performance Index (CPI) at each WBS level
33 e. Schedule Performance Index (SPI) at each WBS level
34

35 4.1.4.3 Enterprise-wide Contractor Manpower Reporting Application (ECMRA) The contractor shall report ALL
36 contractor labor hours (including subcontractor labor hours) required for performance of services provided under
37 this contract for C4I Engineering, Integration, and Installation Contract (CEnIIC) via a secure data collection site.
38 The contractor is required to completely fill in all required data fields using the following web address
39 <https://doncmra.nmci.navy.mil>. Reporting inputs will be for the labor executed during the period of performance
40 during each Government fiscal year (FY), which runs October 1 through September 30. While inputs may be
41 reported any time during the FY, all data shall be reported no later than October 31 of each calendar year.
42 Contractors may direct questions to the help desk, linked at <https://doncmra.nmci.navy.mil>.
43

44 4.1.5 Engineering Review Boards and Inspections The Contractor shall participate in review boards and
45 inspections to formally assess the maturity of Contractor-developed designs and products, identify defects and defect
46 trends, record corrective actions, and obtain technical authorization to release documents and drawings when
47 directed to do so by the Government. External products shall be reviewed at regular intervals with Government
48 teams, including final product review.
49

50 4.1.6 Readiness Reviews The Contractor shall participate in Government-led readiness reviews. Readiness reviews
51 are scheduled and conducted by the Government at planned intervals as specified in the IMS, and their purpose is to
52 review technical and programmatic progress for a specific project or design effort. The review team typically
53 consists of personnel representing relevant functional areas and/or stakeholders. Checklists, including entrance and
54 exit criteria, will be provided by the Government for each review to ensure they are comprehensive and reflect
55 lessons learned from previous reviews. The Contractor shall demonstrate that entrance criteria have been met prior

1 to each review, and shall demonstrate that exit criteria have been met after each review. For example, the readiness
2 reviews currently defined by the Government are:

- 3 a. Systems Readiness Review (SRR) The SRR examines the functional and performance requirements
4 defined for the system and the preliminary program or project plan and ensures that the requirements and
5 the selected concept will satisfy the stated requirements.
- 6 b. Design Readiness Review (DRR) The DRR evaluates the adequacy of the design requirements and the
7 capability of the design to meet these requirements, and identifies problems before moving to procurement
8 and production. The DRR is sometimes divided into a “preliminary design review” and a “critical design
9 review”.
- 10 c. Production Readiness Review (PRR) The PRR ensures that the production plans, the fabrication, assembly,
11 and integration-enabling products, and the personnel are in place and ready to begin production.
- 12 d. Testing Readiness Review (TRR) The TRR ensures that the test article (hardware/software), test facility,
13 support personnel, and test procedures are ready for testing and data acquisition, reduction, and control.
- 14 e. Installation Readiness Review (IRR) The IRR ensures that the installation plans, location, equipment,
15 materials, and personnel are in place prior to the start of installation.

16
17 4.1.7 Technical Reports The Contractor shall develop and provide technical reports. Technical reports may include
18 studies, white papers, technical presentations, and other technical reports, and the delivery dates shall be negotiated
19 with the request for the specific report. (CDRL A016)

20
21 4.1.8 Risk Management The Contractor shall employ Risk Management principles to identify, assess, and mitigate
22 events that could adversely impact the program/project. The Contractor shall perform risk management planning to
23 include risk identification, qualitative and quantitative analysis, risk mitigation, and monitoring and controlling risk
24 at the TO and program levels.

25
26 4.1.9 Technical Performance Measurement The Contractor shall collect performance metrics for key technical
27 process areas as directed by the Government.

28
29 4.1.10 Equipment Installation Management The Contractor shall be responsible for integration of equipment
30 installation efforts into the IMS. Equipment Installation status updates shall be provided as directed by the
31 Government.

32
33 4.1.11 Cyber IT and Cybersecurity Personnel Management The Cyberspace workforce elements addressed include
34 contractors performing functions in designated Cyber IT positions and Cybersecurity positions. In accordance with
35 DFARS Subpart 5239.71, DoDD 8140.01, SECNAVINST 5239.20A, and SECNAV M-5239.2, contractor
36 personnel performing cybersecurity functions shall meet all cybersecurity training, certification, and tracking
37 requirements as cited in DoD 8570.01-M prior to accessing DoD information systems. Proposed contractor Cyber
38 IT and cybersecurity personnel shall be appropriately qualified prior to the start of the contract performance period
39 or before assignment to the contract during the course of the performance period. The contractor shall be
40 responsible for identifying, tracking and reporting cybersecurity personnel, also known as Cybersecurity Workforce
41 (CSWF) and Cyber IT workforce personnel.

42
43 4.1.11.1 Cybersecurity Workforce Report DoD 8570.01-M and DFAR's PGI 239.7102-3 have promulgated that
44 contractor personnel shall have documented current cybersecurity certification status within their contract. In
45 accordance with clause DFARS 252.239-7001, if cybersecurity support is provided, the contractor shall provide a
46 Cybersecurity Workforce (CSWF) list that identifies those individuals who are IA trained and certified, the prime
47 contractor shall be responsible for collecting, integrating, and reporting all subcontractor personnel. The Contractor
48 shall verify with the Contracting Officer's Representative (COR) or other government representative the proper
49 labor category cybersecurity designation and certification requirements. (CDRL A027)

50
51 **4.2 Quality Control and Quality Assurance** The Contractor shall establish, institute, and maintain a Quality
52 Control program and process in accordance with ISO 9000 family of standards.

53
54 4.2.1 Quality Control Plan (QCP) The Contractor shall develop and deliver a QCP IAW CDRL A017 that identifies
55 how quality assurance and quality control will be implemented for the overall program IAW NAVSEA 9090.310E.
56

1 4.2.2 Process Reviews and Audits The Contractor shall conduct process reviews and audits in accordance with the
2 requirements of NAVSEA TS9090.310E.

3
4 4.2.3 Continuous Process Improvement The Contractor shall emphasize continuous process improvement with the
5 objective of reduced cost of work, improved adherence to schedule, improved speed of transactions, enhanced
6 quality of work life, or improved safety. The contractor shall support and participate in Lean Six Sigma (LSS) as
7 required by the Government.

8
9 4.2.4 Support of Government Quality Initiatives The Contractor shall support and participate in ongoing
10 Government quality assurance initiatives, including Capability Maturity Model Integration (CMMI) working groups,
11 metrics development, increased efficiencies from lessons learned, and analysis projects.

12
13 **4.3 Platform Logistics Support** The Contractor shall utilize a Government-approved system or method for ILS.
14 The Contractor shall collect, correlate, and develop C4I logistics packages to be provided as part of a deliverable to
15 the Government. The Integrated Logistics Documentation shall include an ILS report that captures action item status
16 with narrative summary identifying the progress, delays, and/or problems associated with each ILS process. At a
17 minimum, the status summary should provide reasons for delays and/or problems associated with the ILS
18 deliverables, and recommendations for avoiding/minimizing them in the future. It shall include a final report of
19 equipment procured and final cost, as well as the final Master Equipment List (MEL) listing. (CDRL A013)

20
21 4.3.1 Logistics Management The Contractor shall provide logistics management planning and support to include
22 the identification and coordination of any logistics elements required to support the product. GEIA-STD-0007,
23 Logistics Management Information applies.

24
25 4.3.2 ILS Certification Checklists The Contractor shall provide supportability documentation for non-POR systems
26 only, including preparing ILS certification checklists for delivery to SSC-LANT, PEO C4I, and NAVSEA. The
27 Contractor shall obtain logistics data for each non-POR component of the integrated C4I suite, and obtain and verify
28 accuracy and currency of the information. (CDRL A013)

29
30 4.3.3 Logistics Data Management The Contractor shall enter logistics data for non-POR systems only into the
31 Material & Equipment Real-time Logistics Information Network (MERLIN), Navy Data Environment (NDE), or
32 other database as designated by the Government. The Contractor shall provide Configuration Management
33 information for upload to Configuration Data Managers Database-Open Architecture (CDMD-OA) or other
34 designated CM database to assist in the ship outfitting process.

35
36 **4.4 Material Management** The Contractor shall implement a material management system that provides status
37 and reports to include the ordering, receipt, inspection, test, inventory, control, and shipment of Contractor Procured
38 Material (CPM) required on each Task Order prior to delivery. Government property shall be maintained in
39 accordance with DoDI 4161.02 Accountability and Management of Government Contract Property, DoDI 5000.64
40 Accountability and Management of DoD Equipment and Other Accountable Property, [and DoDI 4140.67](#)
41 [Counterfeit Prevention Policy](#).

42
43 4.4.1 Material Identification, Procurement, Tracking, and Receipt The Contractor shall provide support for the
44 identification of material requirements and for the generation of procurement BOMs for each Task Order. The
45 Contractor shall procure material as required in each BOM and shall provide support for Government procurements.
46 The Contractor shall document the identification, procurement, status, and delivery to the TIF Complex and to the
47 shipbuilder/other designated location of all GFP and CPM items associated with each BOM. The Contractor shall
48 document the location and assist with the disposition of material throughout the production, testing cycle,
49 disassembly, pack-out, load-out, shipment to the shipbuilder/shipyard, and final installation. [The contractor shall](#)
50 [ensure that material is labeled with an Item Unique Identification Number \(IUID\) or Unique Item Identifier \(UII\) in](#)
51 [accordance with SECNAVINST 4440.34 , Implementation of IUID Within the DoN.](#)

52
53 4.4.2 Material Discrepancy Status The Contractor shall identify CPM discrepancies as part of the material receipt
54 inspection process and develop and provide MDRs for those discrepancies. (CDRL A017)

55

1 4.4.3 Material Status Accounting Support The Contractor shall provide support for verifying, and tracking the
2 status of material, (including long-lead items) documenting the required delivery dates, latest projected delivery, and
3 actual receipt dates of equipment and materials. The Contractor shall monitor status of equipment (including facility
4 hardware, technical data, and logistics support items) to ensure timely completion of the C4I integration effort. The
5 Contractor shall report those instances when a late equipment delivery could impact the integration, test, and
6 delivery schedule when the impact is identified. The Contractor shall notify the Government about any items whose
7 status will not support the shipyard schedule.
8

9 4.4.4 Material Status Report The Contractor shall develop and deliver a Material Status Report that lists CPM and
10 Government Furnished Material (GFM) for the TO. The listing shall also include Material brought forward from
11 specific previous TOs (by name and number) and any Material transferred from other hulls. This Report will be an
12 Excel spreadsheet and shall be organized by: TO Number; Hull and Number; Part Number; Serial Number;
13 Description; Unit Cost; Quantity Remaining; Location in TIF; Procured By (Contractor/Government);
14 Disposition/Recommended Disposition. Disposition will describe how and where Material was used/disposed
15 of/consumed during Period of Performance (PoP). Recommended Disposition will include transfer of Material
16 remaining in inventory (either at the TIF Complex, Shipyard, or at the Contractor warehouse at end of PoP) to a
17 specified follow-on TO, disposal per approved processes, or transfer to other TOs/hulls that will benefit the
18 Government in their cost-savings initiatives. This Report is due to the Government no later than forty-five (45)
19 calendar days prior to the TO's PoP end date. (CDRL A024)
20

21 **4.5 Systems Packaging and Transportation** The Contractor shall assist the Government with implementing a
22 plan to perform packaging, handling, storage, and transportation of ship systems to the shipbuilder or other U.S.
23 destinations as the COR may direct. The Government shall coordinate transportation.
24

25 4.5.1 Product Preparation and Packaging The Contractor shall plan and prepare the integrated suite for delivery to
26 the shipbuilder and perform inventory and disassembly of the integrated suite. Packaging shall be accomplished in
27 accordance with MIL-STD-2073-1(E)1: DoD Standard Practice For Military Packaging, MIL-PRF-55585G,
28 Electronics Equipment and Parts: Packaging of; and MIL-STD-129, Military Marking for Shipment and Storage.
29 The Contractor shall prepare and deliver a platform-specific Product Delivery Plan. (CDRL A013)
30

31 **4.6 ~~Tech Manuals and Crew Support and Familiarization~~** The Contractor shall develop and deliver a C4I
32 Systems Interactive Electronic Technical Manual (IETM) in accordance with MIL-PRF-87268A. The Contractor
33 shall provide crew familiarization for total system operation of the C4I suite. (CDRL A015)
34

1 5.0 ACRONYM LIST

2

Acronym	Definition
ABS NVR	American Bureau of Shipbuilding Naval Vessel Rules
ASME	American Society of Mechanical Engineers Standard
BOM	Bill of Material
BSR	Baseline Schedule Review
C4I	Command, Control, Communications, Computers, Intelligence
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CBD	Cable Block Diagram
CCB	Configuration Control Board
CCI	Controlled Cryptographic Item
CDMD-OA	Configuration Data Managers Database-Open Architecture
CDRL	Contract Data Requirements List
CFE	Contractor Furnished Equipment
CM	Configuration Management
CMMI	Capability Maturity Model Integration
CMP	Configuration Management Plan
CMS	Crypto Management System
CN	Change Notice
COMM Plan	Communications Plan
COMSEC	Communications Security
COR	Contracting Officer's Representative
CPI	Cost Performance Index
CPM	Contractor Procured Material
CPSMR	Contractor's Progress, Status, and Management Report
CR	Change Request
CRS	Cable Run Sheet
CSA	Configuration Status Accounting
CSPR	Cost, Schedule, and Performance Report
CSWF	Cybersecurity Workforce
DADMS	Department of the Navy Application and Database Management System
DoD	Department of Defense
DOD- STD	Department of Defense Standard Practice
DoDAF	Department of Defense Architecture Framework
DoN	Department of the Navy
DoN CIO	Department of the Navy Chief Information Officer
DR	Design Requirements
DRR	Design Readiness Review
EAC	Estimate At Completion
ECMRA	Enterprise-wide Contractor Manpower Reporting Application

Acronym	Definition
ECO	Engineering Change Order
ECP	Engineering Change Proposal
ECR	Engineering Change Request
EDM	Engineering Direction Memorandum
EHF TIP	Extra-High Frequency TDMA Interface Processor
EKMS	Electronic Key Management System
ELA	Enterprise License Agreement
EMP	Electromagnetic Pulse
ESOH	Environment, Safety, and Occupational Health
ESWBS	Extended Shipboard Work Breakdown Structure
FAM	Functional Area Manager
FID	Functional Interface Diagram
FY	Fiscal Year
GAR	Gateway Access Request
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GFM	Government Furnished Material
GFP	Government Furnished Property
H.I.	High-Impact
HEMP	High-Altitude Electromagnetic Pulse
HERP	Hazards of Electromagnetic Radiation to Personnel
HFE	Human Factors Engineering
HIS	Human Systems Integration
HVAC	Heating, Ventilation, and Air Conditioning
IA	Impact Assessment
IA	Information Assurance
IAW	In accordance with
ICD	Installation Control Drawings
ICL	Inter-Compartment Cable List
IEEE	Institute of Electrical and Electronics Engineers
<u>IETM</u>	<u>Interactive Electronic Technical Manual</u>
ILS	Integrated Logistics Support
ISO	International Standards Organization
IMS	Integrated Master Schedule
IPMR	Integrated Program Management Report
IRD	Installation Requirements Drawing
IRR	Installation Readiness Review
IT	Information Technology
<u>IUID</u>	<u>Item Unique Identification Number</u>
KMI	Key Management Infrastructure

Acronym	Definition
LSS	Lean Six Sigma
MATID	Material Identification
MEL	Master Equipment List
MDR	Material Discrepancy Report
MERLIN	Material & Equipment Real-time Logistics Information Network
MIPR	Military Interdepartmental Purchase Request
MOA	Memorandum of Agreement
MRR	Material Receipt Report
NAVSEA	Naval Sea Systems Command
NDE	Navy Data Environment
NOR	Notice of Revision
NSN	National Stock Number
O&F	Outfitting & Furnishing
O&I	Outline & Installation
O&M	Outline & Mounting
OPSEC	Operations Security
OSHA	Occupational Safety and Health Administration
PBS	Product Breakdown Structure
PECP	Preliminary Engineering Change Proposals
PEO	Program Executive Office
PEO C4I	Program Executive Office for Command, Control, Communications, Computers, Intelligence
PoP	Period of Performance
POR	Program of Record
PL	Project Lead
PRR	Production Readiness Review
PSP	Personnel Security Program
PWS	Performance Work Statement
QCP	Quality Control Plan
RF	Radio Frequency
RFP	Request for Proposal
SAG	Systems Administrators Guide
SAR	Satellite Access Request
<u>SCAT</u>	<u>Sub-Category</u>
SCD	Ship Change Documents
SCI	Sensitive Compartmented Information
SCN	Specification Change Notice
SDCP	Shock Deficiency Correction Plan
SEMP	Systems Engineering Management Plan
SLIN	Sub-contract Line Item Number

Acronym	Definition
SOE	Schedule of Events
SoS	Systems of Systems
SOVT	System Operational Verification Test
SPAWAR	Space and Naval Warfare Systems Command
SPAWARINST	SPAWAR Installation Requirements Drawings Standard
SPI	Schedule Performance Index
SPM	Ship Program Manager
SRR	Systems Readiness Review
SSC-LANT	SPAWAR System Center—Atlantic
SUG	Systems User Guide
SV	System View
SWAP	Space, Weight, and Power
TCP	Test Change Proposal
TDBD	Top-Down Breakdown
TDP	Technical Data Package
TIF	Test and Integration Facility
TIIRF	Test and Integration Facility Invoice and Inventory Receipt Forms
TO	Task Order
TPRR	Test Problem Report and Resolution
TRR	Test Readiness Review
TS	Technical Specification
TS	Top Secret
TSTP	Total Ship Test Program
TVS	Tactical Variant Switch
<u>UII</u>	<u>Unique Item Identifier</u>
WBS	Work Breakdown Structure
WDR	Work Discrepancy Report

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2 (End of PWS)