**C2BMC S8.2-3 Capability
Development to Deployment Task Order**

Task Order Number 0014

Statement of Work Revision 4

August 24, 2017

Table of Contents

The following Task Order (TO), Number 0014, shall be performed by the Contractor as a TO under Missile Defense Agency (MDA) Indefinite Delivery Indefinite Quantity (IDIQ) Contract HQ0147-12-D-0003. In case of conflict between this Statement of Work (SOW) and the basic IDIQ Contract in effect at time of award of this TO, the basic IDIQ shall have precedence.

1.0   TASK DESCRIPTION

The purpose of this TO is to define the requirements for the Contractor to develop and deploy the Command and Control, Battle Management and Communications (C2BMC) capability for Phase III of the Phased Adaptive Approach (PAA). C2BMC is one Element of the Integrated Ballistic Missile Defense System (BMDS) providing a limited active defense against enemy attacks. C2BMC coordinates Defense Design, Sensor and Weapon Element operations to achieve integrated capabilities beyond each individual Element autonomous capabilities.

2.0   BACKGROUND

The MDA is developing the Integrated BMDS to defend the forces and territories of the United States, its Allies, and Friends against all categories (short, medium, intermediate, and long range) of ballistic missile threats. The BMDS will accomplish this mission by providing an integrated layered defense that employs sensors for threat detection and tracking, battle management aids for real-time decision making in accordance with (IAW) defined doctrine during mission planning cycles, and weapons to engage threat targets in all phases of their flight. The C2BMC Phase III Capability (S8.2-3) will be designed and developed IAW the Government-approved C2BMC Build D Element Specification (CES). Major capabilities are summarized:

Mission Planning: 2018 Red/Blue Force Validation Updates
Battle Management: BMDS Overhead Persistent Infra-Red (OPIR) Architecture (BOA)
                             6.1 Integration
Battle Management: Mission Data Record and Playback (RnP)
Battle Management: 2018 IBCS IOC Link 16/Joint Range Extension (JRE) Interoperability
Battle Management: Initial Aegis BMD Engage–on–Remote (EoR) Link System Track
Battle Management: Track Processing Updates for BOA 6.1 (2018) National Sensors
Net Centric: Link 16/JRE Message Interface Changes

The C2BMC system is the integrating element for the BMDS, providing critical mission coordination among BMDS planners, sensors and shooters. The Government is responsible for the evolutionary C2BMC spiral acquisition with the development, integration, test, and fielding of capabilities that provide significant improvements to BMDS Warfighter operations. There are currently 100+ C2BMC workstations fielded globally to support numerous Army Air & Missile Defense Commands (AAMDCs), Air & Space Operations Centers (AOCs), and various warfighter organizations to implement Integrated Missile Defense (IMD).

3.0 PROGRAM MANAGEMENT

The Contractor shall provide Program Management services to enable planning, controlling, directing, monitoring, reporting, and managing in a manner consistent with TO requirements.

All documentation created and maintained in a database or storage medium associated with this contract shall be delivered to the Government's Contracting Officer by the various Contract Deliverables Requirements List (CDRLs) associated with this contract. All deliverables (CDRLs) shall be submitted to the Government's Contracting Officer electronically, unless otherwise stated, with distribution method to the Government to be determined by the C2BMC Program Management Office. Therefore, all such data shall be in compliance with the terms and conditions of the contract.

3.1 Integrated Process and Product Development (IPPD)

The Contractor shall apply an IPPD approach in all technical/functional disciplines and requirements in a coordinated manner to meet established financial management, resource, cost, schedule, performance, and supportability requirements for the C2BMC system.

3.2 Contractor Integrated Performance Management

The Contractor shall prepare and use an integrated performance management system. Central to this integrated system shall be a Department of Defense (DoD) validated Earned Value Management System (EVMS). The EVMS shall be linked to, and supported by, the Contractor's management processes and systems to include the Integrated Master Schedule (IMS), Contract Work Breakdown Structure (CWBS), change management, material management, procurement, cost estimating, and accounting.

3.3 Integrated Baseline Reviews (IBRs)

The Contractor shall support the Government Program Manager, Contracting Officer and his/her representatives in IBRs to evaluate the risks inherent in the performance measurement baseline for this TO. The totality of the baseline will be reviewed and evaluated no less than annually by the Government. Each IBR will verify that the Contractor is using a reliable performance measurement baseline (to include the entire contract scope of work for this TO), is consistent with contract schedule requirements, and has adequate resources assigned.

3.4 Process Control

The Contractor shall maintain a set of operating documentation that provides management direction, policies and procedures, per established Contractor tools and procedures IAW existing Government processes.

3.5 Program Reviews

The Contractor shall support the planning, preparation, conduct, and preparation of minutes of program reviews. The Contractor shall support the IBR, Program Management Reviews (PMR), Government-led Internal Configuration Control Board (ICCB), Integration Synchronization Group (ISG)/Integration Synchronization Center (ISC), Program Change Board (PCB), bi-weekly Joint Business Reviews, and other meetings as agreed on by the Government and Contractor. The Contractor shall support C2BMC component immersion reviews with the Government to facilitate understanding and agreement with implementation approaches used for chosen technical efforts. The results of these reviews shall include updating program documentation based on the outcome of the

reviews. The Contractor shall provide progress reports to the Government in monthly C2BMC Cost/Schedule Executive Round Table (C/SERTs).

3.6 Bills of Material Management (BOM)

The Contractor shall manage the BOM and control changes IAW program configuration control procedures for this TO. The Contractor shall monitor new material requirements, technical refresh, obsolescence, and lifecycle upgrades. The Contractor shall identify when changes are required to BOM line items to meet baseline program requirements and ensure that these BOM changes are coordinated with the Government.

3.7 Software Resources Data Reporting (SRDR)

The Contractor shall prepare and deliver the Software Resources Data Reporting (SRDR) IAW DI-MGMT-81739B (CDRL A142) and DI-MGMT-81740A (CDRL A143). The SRDR includes the Initial Developer Report, the Final Developer Report, and the Data Dictionary. All SRDRs must be in accordance with approved Cost and Software Data Reporting (CSDR) Plan provisions, the WBS Data Dictionary, and the CSDR Manual (DoD 5000.04-M-1). The Contractor shall use the CSDR Plan (DD Form 2794) format that is included as a contract attachment.

4.0 TASKS

This is the follow-on spiral of C2BMC, building upon S8.2-1 that is being developed under TO 0001. S8.2-3 shall be designed and delivered as a Troubleshooting Procedure (TP) adding EPAA Phase III capabilities discussed below to the S8.2-1 baseline that is being developed under TO 0001. As such, there are no COTS software or hardware updates necessary in this spiral capability. The Contractor shall retain all S8.2-1 capabilities unless specifically changed by S8.2-3 requirements or design. The Contractor shall provide C2BMC S8.2-3 capability support for engineering, development, integration, verification, test, deployment/fielding and equipment support. The Contractor shall design, develop, integrate, test, and deliver the C2BMC capabilities specified in the Government's C2BMC Build D Element Specification (CES) for PAA Phase III. Major developments and enhancements summarized from the CES are annotated in section 2.0 of this SOW.

4.1 System/Software Engineering

4.1.1 System Engineering

The Contractor shall apply standard Systems Engineering processes that comply with the MDA/C2BMC Program Office Systems Engineering Plan (SEP) (signed 2/28/2014) to develop, model, fabricate, integrate, test, verify, evaluate, validate, document, deliver, field, train, operate, sustain, decommission and support updates to the C2BMC Element.

The Contactor shall provide technical assistance and information to support a Government-chaired Product Integration Team (PIT) for collaboration and coordination across C2BMC product areas. The Contractor shall include Government product engineers, C2BMC Tri-Service Cell representatives, and Subject Matter Experts (SMEs) within the engineering development teams to participate in the Contractor's system and software designs including:

- Architecture Design

- Requirements analysis/refinement
- Systems/software engineering and design
- Obsolescence/Vanishing Vendor
- Other activities specifically identified in this SOW.

The Contractor shall update and maintain the Government provided S8.2-3 Operational Concept (OCD) Description Document.

4.1.2 Design/Readiness Reviews

The Contractor shall conduct an S8.2-3 Initial Requirements Review and Design Technical Interchange Meeting (TIM), Critical Design Review (CDR), Test Readiness TIM and a spiral development Ship Readiness Review (SRR).

Scheduling of these Design/Readiness Reviews is based on readiness to complete the reviews and as approved by the Government. For reference purposes, the Initial Requirements Review and Design TIM should be scheduled ~45-60days after award and CDR ~90-150 days after Initial Requirements Review and Design TIM. All Technical reviews are to be scheduled to minimize risk to the program, support the GT-07b schedule, EPAA Phase III, and the NORTHCOM/PACOM 8.2-3 TCD (scheduled to be determined by the current IMTP). Approval of all technical reviews (CDR, SRR) completion will be based on criteria as noted in the System Engineering Plan and additional exit criteria designated by the C2BMC Contracting Officer. Approval of all TIM reviews (Initial Requirements and Design TIM, Test Readiness TIM) will be based upon tailored criteria from the C2BMC Architecture and System Engineering Management Plan (ASEMP) and additional exit criteria designated by the C2BMC Contracting Officer.

Initial Requirements Review and Design TIM is conducted to baseline the requirements for the S8.2-3 system, the capabilities to be implemented, readiness to proceed with preliminary design, assessment of risks, and Government approval of C2BMC Spiral Specification (CSS). In addition, this TIM will review the preliminary Hardware/Software designs, requirement allocations, technical adequacy, risk assessment and mitigation, algorithm maturity, and assess readiness to move into detailed design and initial software development. Government approval at the conclusion of the Initial Requirements Review and Design TIM is required to proceed with detailed design.

CDR is conducted to baseline the S8.2-3 design implementation prior to receiving Government approval at the conclusion of CDR is required to proceed with final development and coding.

Test Readiness TIM is conducted to approve entry into Formal Verification Testing (Cycle 2).

SRR is completed prior to each major release of Software to include: coordination of release/deployment with TO Management; Requirements Managers and Development Leads; confirmation that Assessment and Authorization (A&A) Plan of Actions and Milestones (POA&Ms) are in place; all release requirements are met or delivery of proper variances has been completed; and delivery of all required CDRLs has been completed. The software SRR is conducted to ensure the readiness of the spiral software for delivery to the test (GT-07b series) and/or operational sites and cycle 5 testing. The SRR and delivery of software to the field requires Government approval.

4.1.2.1   Reserved   (Planner-to-C2BMC Interface)

4.1.2.2   C2BMC Build D Element Specification (CES)

The CES will be provided as Government Furnished Information (GFI) via the Dynamic Object-Oriented Requirements System (DOORS) partition. The Contractor shall use the CES to derive its spiral requirements for initial and subsequent deliveries of the S8.2-3 C2BMC Spiral Specification (CSS). CES v5.0 is the starting point for this TO. These changes to v5.0 are to be addressed by the Contractor:

- CES-2414 is NOT to be implemented by the Contractor; it is allocated to the Planning Analysis Support Cell;
- CES-2963 is NOT to be implemented by the Contractor; it is allocated to a later build;
- CES-3958 is NOT to be implemented by the Contractor; it is to be replaced by CES-3983 which reads: C2BMC shall use Link 16 to exchange messages in accordance with MDA-STD-007 Change 1 "Section 4.4 CI D4 MDA-STD-007 Requirements" with removal of Mandatory ICPs TM05-170 CH4; TM06-027 CH5; TJ09-050 CH4; TM09-059 CH7; TM09-111 CH3; TM09-149 CH2; TM11-006 CH4; TM11-020 CH3; TM11-047 CH3; TM12-009 CH6; and TM12-010 CH5;
- CES-2960 is changed to read: C2BMC shall enable the user to specify variable time spacing between launch events from specific launch areas for a Scenario Analysis in accordance with the anticipated red-force courses of action;
- CES-2962 is changed to read: C2BMC shall enable the user to specify multiple threat trajectories types (lofted or nominal) from each specific launch area in accordance with the anticipated red-force courses of action.

4.1.2.3   S8.2-3 C2BMC Spiral Specification (CSS)

The Contractor shall develop and maintain a CSS in DOORS which is traceable to the Government-maintained CES and applicable System Interface Control Documents (SICDs). The Contractor shall identify all CSS requirements in DOORS as safety critical, safety related, or not applicable. The Contractor shall develop the initial and subsequent revisions to the CSS and associated DOORS representation based on the Government maintained CES. Traceability shall be maintained to the CES for changes to C2BMC documentation. All specifications and associated documentation, such as Specification Change Notices (SCNs), shall be delivered to the Government (CDRL A015).

4.1.2.4   Interface Documentation

The Contractor shall participate in and support the development of the Interface Control Document (ICD) Part 1 documents as defined in the BMDS Technical Baseline (TBL). The Contractor shall also establish and maintain ICD Part 2s (CDRL A013) and Document Change Notices (DCNs) (CDRL A013), as required by the Government, and ensure traceability to ICD Part 1s. Delivery of documents as required by CDRL A013, should be delivered to the Contracting Officer. The Contractor shall establish and maintain Interface Description Documents (IDD) and acceptable delivery of the IDDs will be via the Data Accession List (DAL).

4.1.2.4.1   ICD and IDD Scope

The Contractor shall provide documentation maintenance support of ICDs, IDDs and DCNs for previous spiral builds of C2BMC. The Contractor shall provide new and updated ICDs for the S8.2-3 build, including the development of new and updated DCNs, as determined by the Government, to fully document the system design. The Contractor shall provide technical support for ICDs developed by MDA, or by other organizations supporting the BMDS and impacting C2BMC (as agreed to by the Government and the Contractor). The Part 2 ICDs and IDDs specifically identified (by functional title) for maintenance and update by the Contractor consists of:

Part 2 Interface Control Documents (ICDs):

- Build D C2BMC to Host Nation (Japan)
- Build D C2BMC to Host Nation (Israel)
- Build D C2BMC and X-Band Radar (AN/TPY-2)
- Build D General and Link 16 Formatted Data
- Build D C2BMC to Ground-Based Midcourse Defense (GMD)
- Build D C2BMC to BOA
- BMDS Build D and External Command Center Systems (ECCS)
- Build D C2BMC to Joint Space Operation Center (JSpOC) Mission System (JMS).

Part 2 Interface Description Documents (IDDs):

- Net-Centric Command and Control (NC2) IDD - C2BMC with Defense Information Systems Agency (DISA) EM 4.0.
- Air and Missile Defense Workstation (AMDWS) to C2BMC Planner
- Maritime Integrated Air and Missile Defense Planning System (MIPS) to C2BMC Planner.

The Contractor shall support reviews and coordination of these ICDs:

- Build D C2BMC to NATO (Real Time (Link 16))
- Build D C2BMC to NATO (Non Real Time (Planner))
- Build D C2BMC to Increment 2 Space Based Infrared System (SBIRS).

4.1.2.4.2   Reserved   (ICD Verification)

4.1.2.5   Dynamic Object-Oriented Requirements System (DOORS)

The Contractor shall maintain all data associated with the S8.2-3 CSS, part 2 ICDs and SCNs/DCNs in the Contractor's DOORS database. CES requirements traceability to the CSS shall be maintained in the Contractor's DOORS database. The Contractor shall publish periodic reports in a DOORS format as specified by the Government, and make available those reports in the searchable repository. The reports will be marked with proper DFARS marking and have no proprietary markings. The Contractor shall maintain transportability of partitions between the Government and Contractor maintained DOORS databases. The Contractor shall provide a copy of DOORS specifications, part 2 ICDs, and SCNs/DCNs Partition, after the Contractor has received formal approval by the Government of ICDs or SCNs/DCNs, or as requested by the Government. The Contractor shall provide access to DOORS at each Contractor facility. The Contractor shall provide technical assistance and information to support a Government Configuration Control Board (CCB).

4.1.2.6   Deviations and Waivers

Any request for deviations or waivers to spiral specifications and/or Part 2 ICDs/IDDs shall be provided to the Government for acceptance. Any request for deviations or waivers to the verification of CES requirements or Part 2 ICDs/IDDs shall be delivered to the Government for acceptance (CDRL A048).

4.1.3   Software Engineering

The Contractor shall use the S8.2-1 software development process that complies with the IEEE 12207 Software Life Cycle Processes, Engineering Industries Association (EIA)/IEEE J-STD-016-1995, and consistent with the MDA Assurance Provisions (MDA-QS-001-MAP-Rev A).

The Contractor shall maintain interfaces with other BMD elements hardware and software and deliver new capabilities in the S8.2-3 build.

The Contractor shall design, prototype, develop, implement, qualify, and produce the S8.2-3 architecture.

The Contractor shall provide all software executables, source code, source code object, tool sets, libraries, licensing provisions, software user manuals and documentation for each increment to the Government IAW the C2BMC contract technical data and computer software rights terms and conditions (CDRL A042, A044).

The Contractor shall conduct a peer review for design of each new or modified module. Government product engineers and SMEs must be included as part of each peer review.

The Contractor shall integrate S8.2-3 into the MDA Test Program as outlined in the Integrated Master Assessment Plan (IMAP) and the Integrated Master Test Plan (IMTP) to complete verification prior to fielding.

4.1.3.1   Software Development Plan (SDP)

The Contractor shall use the S8.2-1 Software Development Plan as the basis for Software development of S8.2-3.

4.1.3.2   Development Lab Support

4.1.3.2.1   Development Software Tools

The Contractor shall provide any software integration or troubleshooting tools developed to support development lab analysis and integration on request (CDRL A042, A044).

4.1.3.2.2   Lab Analysis and Integration

The Contractor shall integrate and analyze software builds and modifications to them, to assist in maturing the software and identifying issues before installation in the Government maintained C2BMC Testbed lab equipment used for verification and system testing.

4.1.3.3   COTS, GOTS, and Maintenance

The Contractor shall update the development lab environments (Development, IA, Network) with representative hardware and software, as required to stay in line with the operational system, as approved by Government Contracting Officer.

4.1.4   System Modification Requests

4.1.4.1   System Modification Request (SMR) Development

The Contractor shall develop software fixes to any of the Contractor-developed software products during integration, test, and fielding phases of the S8.2-3 lifecycle in accordance with PR-PM-0048 System Modification Request Process. The Contractor shall develop these fixes as prioritized by the Government based on a Government schedule and budget. The Contractor shall work high priority SMRs as out-of-cycle and shall deliver them using established processes. The Contractor shall provide a description of the test approach and pass/fail criteria for development and integration/test for planned Troubleshooting Procedures (TP)s, the status of which will be provided via existing forums. The Contractor shall consider cost in the decision making process for developing TPs from SMRs. The Contractor shall provide documentation to the Government to list which specific SMRs are addressed in each TP.

4.1.4.2   SMR Tracking

The Contractor shall maintain documentation on the SMR analysis, trade studies, and resolution in accordance with PR-PM-0048 System Modification Request Process, and provide database access to the Government. The Contractor shall maintain the SMR process and database which shall be accessible to the Government. The Contractor shall make recommendations to the Government on the priority and disposition of each SMR.

4.1.4.3   SMR Documentation

The Contractor shall update the system configuration, design, and architecture documentation to reflect the changes associated with a given SMR.

4.1.4.4   SMR Metrics

The Contractor shall propose and implement a method to capture 1) rough estimates for cost and 2) reason codes for each Test Discrepancy Report (TDR), Baseline Change Request (BCR), and Non-Conformance Report (NCR). The rough estimated cost information shall be completed as part of the Analysis phase of the SMR process. The rough cost estimates shall include estimated cost for development, integration and test. The reason codes will be added during the analysis phase per the existing SMR process. The reason codes and rough order cost bins shall be proposed by the Contractor and approved by the Government. These metrics are required for new S8.2-3 SMRs (TDRs, BCRs and NCRs). These cost estimates and reason codes will not be used by the Government for detailed analysis and decision making for particular SMRs, but rather to identify trends for the purpose of process improvement for both Contractor and Government processes. These estimates may be used as the basis for the Government requesting Engineering Estimates or Rough Order of Magnitude (ROM) estimates for specific SMRs.

4.1.4.5   SMR Test Reporting

The Contractor shall make available upon request to the Government all SMR test plans and results.

4.1.4.6   **Reserved**   **(Deficiency Reviews)**

4.1.4.7   **Reserved**   **(Failure Reporting Analysis & Corrective Action)**

4.1.5   Software Development Kit (SDK)

The Contractor shall maintain an Adaptable Toolkit for Open Message Service (ATOMS) SDK to allow third-party developers to provide software applications that can be integrated into the C2BMC System/Software computing and messaging infrastructure.

4.1.6   Software Installation Planning

The Contractor shall support software installation as described in the C2BMC Development Integrated Product Team SDP. The Contractor shall provide a plan for software installation in support of C2BMC software for development, integration and test, and deployment to operational locations using the Troubleshooting Procedure installation instruction as the primary vehicle.

4.1.7   Integrated Engineering

The Contractor shall translate CSS requirements into configuration controlled software through a systematic approach to integrated design. The Contractor shall integrate all technical requirements and disciplines into a coordinated effort to meet cost, schedule, performance, affordability, quality, reliability, producibility, and supportability requirements IAW the ASEMP.

4.1.8   User Interface Engineering

The Contractor shall execute a Human Factors Engineering (HFE) program during development and acquisition of the C2BMC system (defined as C2BMC, C2BMC Planner, and C2BMC System Management (CSM) to ensure effective integration of personnel in the design of the system. The Contractor shall follow guidance provided by MDA, and shall also develop, document and follow a process (Human Engineering Program Plan), to provide structured methods for achieving usability in user interface engineering and design during product development. The Contractor shall participate in and support the work of the HFE Functional Area. The Functional Area will use the HFE Style Guide from S8.2-3 for new requirements for S8.2-3. The Contractor shall use existing Government (e.g., MIL-STD-1472, MIL-STD-2525C) guidelines, commercial style guides approved by the Government, as well as style conventions from previous C2BMC S8.2-1 deliverables as the primary source for design guidelines. The Contractor shall identify all conflicts for the HFE Functional Area to resolve differences between guidelines.

4.1.8.1   **Reserved**   **(HFE Integrated Product Team)**

4.1.8.2   **Human Factors Test and Evaluation**

The Contractor shall conduct a Human Factors Test and Evaluation Program as described in the Human Engineering Program Plan.

4.1.8.3   **Human Factors Requirements Verification**

The Contractor shall verify all applicable MIL-STD-1472 requirements.
The Contractor shall verify all applicable MIL-STD-2525C requirements.

4.1.8.4   Reserved   (Warfighter Integration)

4.1.8.5   Reserved   (Wargames and Exercise Support)

4.1.8.6   Reserved   (Warfighter User System Modification Request)

4.1.9   C2BMC Algorithm Engineering

The Contractor shall develop, document, and manage the algorithm baseline, critical methods, reference implementations, algorithm system engineering documents and reports, and architectures IAW Best Practices. This includes participation in the Government's IPT process via the Algorithms Collaboration Team (ACT) and BMDS System Assessment Team (BSAT).

4.1.9.1   C2BMC Algorithm Documentation, Reference Implementation, & Software

The Contractor shall develop and deliver system engineering documentation to describe the C2BMC algorithms to include algorithm logic description, reference implementation, and critical methods for each critical C2BMC algorithm. The Contractor shall prepare and deliver all source software and object code and associated data/documentation. The Contractor provided user manuals, user procedures and documentation shall provide insight into software, data, and deliverables. This information shall include all supporting Software Development Folder artifacts. Supporting documentation shall fully and accurately describe the delivered software source code, object code, and executables (including build instructions and installation instructions), and its associated requirements baseline and test reports (CDRL A042, A044).

4.1.10   C2BMC Architecture

The Contractor shall modify the S8.2-1 System Architecture as necessary to realize the S8.2-3 capabilities. The Contractor shall describe the resulting S8.2-3 System Architecture by updating these S8.2-1 system architecture artifacts as appropriate:

- Architecture Overview
- Common Services Hardware Platform
- Design Constraints
- System Architecture Model
- Modes/States
- Top Level Architecture (Pony Blanket)
- Transition Strategy
- Safety Separation Paper.

The System Architecture Model shall have its logical, physical, and deployment views modified using System Modeling Language (SysML) notation to capture S8.2-3 related changes to the:

- Logical system composition, subsystem behaviors, message flows, and connections
- Physical hardware implementation patterns and software allocations to hardware
- Deployment designs of the hardware, software, and network infrastructure.

The Contractor shall identify in the physical and deployment views the COTS hardware, Government approved Free and Open Source Software (FOSS), necessary interface equipment and Government Furnished Equipment (GFE) for each site where C2BMC equipment will be deployed (CDRLs A026).

Updates to the SysML-based System Architecture Model shall include cross-references to the key, authoritative ICDs, element spiral (ES) requirements, and C2BMC Element Specification (CES) as necessary to allow model diagrams to be traced to the appropriate driving specifications. The SysML-based System Architecture Model shall be included into the A026 CDRL as an HTML report that unambiguously identifies which diagrams compose the baseline being delivered by the CDRL.

4.1.11 Analysis and Assessments

The Contractor shall perform analyses/assessments supporting the BMDSS Build and S8.2-3 evolution of the C2BMC Element, starting from a S8.2-1 baseline, addressing spiral content and growth planning, design trade-offs, algorithm development/effectiveness, capability specification, and performance prediction and assessment. This analysis shall demonstrate that the requirements allocated to S8.2-3 are feasible and sufficient to achieve the specified performance within mandated latencies using standards-based interfaces for the C2BMC, and allow for ease of implementing future enhancements or updates per the open systems approach. The Contractor shall provide formal ARL assessments as part of the CDR and Test Readiness TIM milestones, with continuing analysis through the TCD milestone.

4.1.12 PCB Support

In support of the S8.2-3 PCB decision milestones, the Contractor shall collect and assemble information and coordinate briefings among warfighters, other BMDS Elements, and MDA organizations to share current program status, test status, and capability assessment findings with the pertinent stakeholders.

  As the release matures, the Contractor shall shift the primary emphasis of subsequent assessments to the performance of assigned missions (Mission-level Assessments), while Capability-level Assessments continue.

The Contractor shall include the Test Reports in the capability-based assessment to support program decision milestones such as Ship Readiness Reviews and Program Control Boards. The Contractor shall provide a report that identifies open BMDS Discrepancy Reports (BDRs) which are expected and not expected to be closed by S8.2-3. In this report the Contractor shall assess C2BMC system performance in pre-SRR HWIL tests (e.g. pairwise) in order to demonstrate proper functional interoperability behavior between C2BMC and all other S8.2-3 timeframe relevant builds of BMDS systems (Aegis, BOA, AN/TPY-2). The Contractor shall use a Data Analysis and Reporting Process that consists of these processes:

1. Define Analysis Tools, Procedures, and Element Source Data
2. Perform Data Acquisition and Handling
3. Perform Post-Test Data Analysis
4. Produce Test Reports
5. Perform Data Management and Archiving.

4.1.12.1 Cycle 2 Testing Analysis – Requirement Verification

The Contractor shall apply verification processes to both requirements testing (initial and re-test of software that previously failed verification testing), and to the confirmation that a software maintenance release (SMR) fix or Troubleshooting Procedure (TP) addresses all issues documented in the generating SMRs.

Most requirements verification shall occur in the C2BMC Testbed. Verification that cannot be accomplished in this venue due to lack of driver or insufficient test environment fidelity or an inadequate test environment (such as a lack of realistic long-haul communications) can occur during pairwise, field checkout and/ or system ground test venues. The Contractor shall document the allocation of C2BMC S8.2-3 requirements to each test environment(Federated Model, Playbacks, Pairwise, Ground Test), test phase (cycle 2, or post Ship Readiness Review (SRR)) with assigned scenarios, and receive Government Contracting Officer approval on these allocations. The Contractor shall identify, define, design, develop and document specific scenarios required to verify each requirement.

Cycle 2 Requirements Verification shall be conducted, IAW current processes demonstrated during S8.2-1, in the MDIOC labs after the Government approval of a successful Test Readiness TIM. The Contractor shall support these tasks:

- Verification Test Planning and produce a test schedule
- Requirements allocation to test venues (Federated Model, Playbacks, Pairwise, Ground Test) and test phase (Cycle2 or Post SRR)
- Requirements allocation to scenarios or non-specific scenarios
- Identify, develop and document required verification scenarios and review with the Government
- Participate in requirements reviews
- Develop Detailed Test and Analysis Procedures (DTAPS)
- Identify and develop Test Tools to support verification testing and analysis
- C2BMC spiral specification requirements testing using the DTAPS and Test Tools
- Conduct verification and regression testing for the EUCOM and CENTCOM Dual Combatant Command architecture
- Conduct a Test Readiness TIM providing evidence that the C2BMC system, the DTAPS, the test tools, the supporting test labs and resources and test plan/schedule is ready to begin test execution
- Provide test and analysis results in support of SRR and PCB decisions
- Analyze anomalies and test fixes to Operational baseline
- Generate, report, track and test SMRs
- Provide bi-monthly verification status reporting to ensure timely feedback to customers, internal and external functional groups
- Provide a monthly capability assessment that characterizes and benchmarks C2BMC capabilities, and compare test and analysis results from previous spiral releases
- Provide inputs to the development of the Capability Verification Plan
- Provide support to System Testing and regression testing/analysis for the initial and following TPs and document/report findings

4.1.12.2 Technical Performance Measures (TPMs)

The Contractor shall include, as a minimum, the S8.2-1 TPMs updated for S8.2-3 requirements and capabilities.

The Contractor shall maintain a schedule for reporting the status of C2BMC TPMs at key program milestones and technical reviews in conjunction with S8.2-3 performance reports and assessments. The Contractor shall document the reporting period of each TPM in CDRL A019.

The Contractor shall perform analysis of S8.2-3 development and assess the Technical Performance Measurements (TPMs) from the TPM Management Plan and report this assessment to the Government.

4.1.12.3   S8.2-3 Special Interest Items (SIIs)

Contractor shall include, as a minimum, the S8.2-1 SIIs updated for S8.2-3 requirements and capabilities. The Contractor shall document the SIIs in the TPM/SII Management Plan. The Contractor shall maintain a schedule IAW the TPM/SII Management Plan for reporting the status of S8.2-3 SIIs at key program milestones and technical reviews in conjunction with S8.2-3 performance reports and assessments (CDRL A019)

The Contractor shall perform analysis of S8.2-3 development and assess the SIIs from the TPM/SII Management Plan and report this assessment to the Government.

4.1.12.4   HWIL and Pairwise Testing Analysis

The Contractor shall conduct Hardware-in-the Loop (HWIL) tests (Pair-wise, Tri-wise) using operationally representative networks and test sites. The Contractor shall support these tasks:

- Develop Test Information Sheets documenting at a minimum the test title, test dates, test objectives, test participants, test configuration of all participants sequence of events, test simulation or test data and success criteria.
- Conduct HWIL testing of the C2BMC Element within the integrated BMDS system
- Conduct testing in an environment that uses approved HW/SW representations (or simulations) of the various BMDS Elements
- Validate C2BMC Element interfaces, update and maintain ICDs
- Verify C2BMC spiral specification requirements not completed during Cycle 2
- Generate and test SMRs
- The Contractor shall execute a minimum of 1 HWIL test event:
  - Aegis, TPY-2, Federated Model/with BOA and C2BMC

4.1.12.5   Cycle 5 Testing Analysis – Field Testing

Cycle 5, field testing, is the final test cycle and is conducted on PSN (where necessary, EC/CC). The Contractor shall support these tasks:

- Develop test and analysis plans that identifies at a minimum:
  - Test Title, Test Date(s), Test Participants, Test Objective, Test Success Criteria, Test Sequence of Events, Test Configuration Of All Participants
- Verify C2BMC spiral specification requirements that could not be completed during prior test cycles
- Verify SMR completion in the field (as required)
- Conduct validation testing for the EUCOM and CENTCOM Dual Combatant Command architecture
- Conduct scenario testing
- Coordinate Operations and Sustainment (O&S) participation in the test and operation of the C2BMC system
- Collect and analyze test data
- Provide daily status reports
- Perform real-time analysis of test anomalies

4.1.12.6 GTX, GTI, GTD Analysis

System Test Verification and assessment is conducted using Ground Test Experimental (GTX), Ground Test Integrated (GTI) and Ground Test Distributed (GTD) test venues. The GTX and GTI use HWIL with non-operational networks and test sites. The GTD uses the operational networks and suites. The Contractor shall support these tasks:

- Update the Capabilities and Limitations assessment of Spiral 8.2-1 based on the added capabilities of the S8.2-3 update based on Ground Tests (GTs) and Flight Tests (FTs) data
- ValidateC2BMC element interfaces
- Verify C2BMC spiral specification requirements that could not be completed in either the Requirements Verification or HWIL cycles
- Generate and test SMRs

4.1.12.7 Capabilities and Limitations

The capability assessment shall provide the results of an assessment of the C2BMC functional, behavioral and performance capability provided with the addition of this Spiral's capability and limitations. This assessment report shall form the backbone for the PCB presentation for this spiral.

Emphasis shall be placed on updating C2BMC's capabilities and limitations provided by the Spiral and their impact on the BMDS missions. This assessment shall be based on an end of spiral capability verification data package that will provide supporting documentation. This document shall contain capability verification and demonstrated performance and behavior information obtained during development (cycle 1 and 2) and system (cycle 3, 4, 5) test events. It shall also contain an assessment of the TPMs and SIIs, along with a summary of the important improvements to be provided by pending SMRs and BDRs.

An initial update of a C2BMC performance assessment in support of the BMDS missions shall be given at SRR and then updated after every system test and finalized for PCB for NORTHCOM/PACOM areas of responsibility.

4.1.13 Reserved (System Design)

4.1.14 Technical Baseline Management

The Contractor shall maintain the technical baseline configuration IAW the ASEMP. The Contractor shall provide technical assistance and information to support a Government CCB to manage the technical baseline (beginning at approval of the Test Readiness TIM) to include:

- Hardware Equipment
- Software Applications & Application Protocol Interfaces (APIs)
- Software Module Control & Monitoring API
- ATOMS messages
- Network Configurations.

4.1.14.1 Software Configuration Management

4.1.14.1.1 Control and Management of Software Processes

The Contractor shall perform all development and maintenance of software and test environments in a Software Configuration Management (SCM) environment IAW the Contractor's C2BMC

Configuration Management Plan (CMP). The Contractor CCB shall review, prioritize, and maintain all updates to software, test environments and documentation IAW the CMP. The Contractor Software Quality Assurance (SQA) shall monitor and audit maintenance process steps to ensure that product quality and integrity of baselines and documents are maintained.

4.1.14.1.2   Configuration Change Control

The Contractor shall receive written Government approval for changes to documents under Government control at contract award before implementation of modifications, Requests for Deviation (RFD), or Requests for Waiver (RFW). The documentation shall be made available via searchable repository (CDRL A048).

4.1.15   Special Study Groups

The Contractor shall provide support to special study groups as directed through S8.2-3 SRR. These include, but are not limited to:

- BCD Product Integration Team (PIT) IPT
- C2BMC and BOA Enterprise Architecture Working Group (CAWG)
- Algorithms Collaboration Team (ACT) IPT
- Spiral Architecture Coordination (SpArC) IPT
- Test, Assessment, and Verification (TAV) IPT
- Assessment Working Group (AWG)
- Integrated Engineering Team
- ITAG
- ADSI Working Group.

4.1.16   C2BMC Element-Level Verification and Validation, Test and Reporting

The Contractor shall:

1. Identify capabilities, based on CES/CSS requirements
2. Update, maintain, and execute the TPM and SII Management Plan (CDRL A019)
3. Track, evaluate and report current S8.2-3 TPMs and SIIs and propose other candidates based on the new S8.2-3 capabilities. Provide the TPM Baseline at the Test Readiness TIM and report per the TPM and SII Management Plan (CDRL A019)
4. Continue to use and capitalize on the S8.2-1 developed Mission/Thread-based test approach, IAW the Integration and Test Plan, that links together capabilities, functionality and requirements for Element verification and reporting. Provide all test and/or analysis reports to the BC Program Office
5. Produce Detailed Test and Analysis Procedures (DTAPS) to govern tests. Each DTAPS shall identify all safety critical and safety related requirements being tested
6. Provide all interim results and data required for final Spiral Capability Assessment Report (SCAR) production
7. Develop software and system test documentation (CDRL A044)
8. Provide updates and status for meeting verification objectives in the Spiral Capability Verification and Assessment Report
9. Provide verification outcome information and assessment of key system behavior by capability delivered quarterly

10. Report spiral capability verification data with supporting information as evidence for system fielding
11. Incorporate S8.2-1 Program Verification lessons learned into above statements 4-9

The Contractor shall support Component and Element verification and validation on Government approved and representative test bed hardware and software, models and simulation, including tools developed by the Contractor for successful conduct of the C2BMC program. The Contractor shall develop Analysis Method Papers describing the approach, analytical methods used, and Modeling and Simulation (M&S) selected for satisfying Verification and Validation (V&V) of the selected requirements.

4.1.17   Spiral Capability Verification Plan (SCVP)

The Contractor shall prepare the SCVP to support the Capabilities and Limitations list and Technical Capabilities Declaration documentation of the Government. The SCVP shall be consistent with the C2BMC SCVP format.

4.1.18   General Requirements for Testing

The Contractor shall execute a test program to:

1. Verify C2BMC Spiral Requirements, functionality, and interoperability including off-nominal testing (per MDA Assurance Provisions) of all safety critical requirements.
2. Develop test and analysis plans for field and integration testing (formerly Cycle 5 testing) for PO concurrence prior to commencement of testing. The T&A plans are not formal deliverables, rather a communication tool to define test objectives, asset requirements and acceptance criteria.
3. Provide Element to Element and BMDS-Level Integration Test/Integration support
4. Integrate BMDS System Tests
5. Test and verify fixes designated for the S8.2-3 operational system.
6. Support planning for field Integration and Testing
7. Support Acceptance Testing of the C2BMC deployable communications

The Contractor shall provide access to the S8.2-3 relational database ATOMS and Analysis Log Description Document (ALDD) Relational Database for Verification, Analysis, Reporting, and Collection (AARDVARC) containing data from S8.2-3 requirements verification testing (post Test Readiness TIM) as well as data from all events contained within this TO to the Government. The Contractor shall provide access to all actual S8.2-3 log data files from all events (post Test Readiness TIM).

4.1.18.1   Test Environment and Equipment

The Contractor shall identify at CDR the equipment required in the System Test Lab to support software qualification testing.

4.2   C2BMC Planner

The Contractor shall update/verify the Red/Blue force while maintaining the C2BMC Planner subsystem support of the C2BMC initialization of the Mission Suite, Unified Client (UC) displays, and Operations Capability (OPSCAP) functionality (CDRL A042, A044).

The Contractor shall support Red/Blue force validation activities to include data logging requirements, test tools for batch analysis, development and analysis of test cases. The Contractor shall demonstrate the capability to export a

plan from the S8.2-3 Planner in a form that can be imported into the S8.2-1 Planner for use in the S8.2-1 Operational System.

4.2.1   Continued Red/Blue Force Update

The Contractor shall perform this ongoing activity to improve the quality and quantity of the blue force and red force representations in the C2BMC Planner subsystem, ensuring that the representations are up-to-date with the BMD Elements, as approved by the appropriate MDA/BC board and produce reliable results for force level planning purposes. The Contractor shall work with the BMDS Elements to compare analysis results, update Characteristics and Performance (C&P) data to improve the fidelity of the C2BMC Planner results, identify and implement algorithm improvements. The Contractor shall work with MDA and the Intelligence Centers to update the C2BMC Planner threat representations, based on prioritized Warfighter requirements provided by JFCC-IMD through the C2BMC Program Office. The Contractor shall also maintain, and evaluate performance metrics.

4.2.2   Reserved   (C2BMC Planner Transition Plan)

4.2.3   Support & Improvements to Existing External Interfaces

The Contractor shall provide support for the improvement of existing AMDWS, MIPS, Air Force IAMD, NATO Planning System, Modernized Integrated Database (MIDB) and Common Integrated Air and Missile Defense Extensible Markup Language (XML) Schema (CIXS) interfaces. The Contractor shall provide for test support for the migration of the interfaces from the existing MD_Namespace XML schemas (currently used by AMDWS and MIPS) to the CIXS standard (where applicable and coordinated). The Contractor shall also provide support for testing with MIPS prior to SRR.

4.2.4   U.S. Air Force IAMD Planner Operational Concept

The Contractor shall support architectural and operational concept development integration and troubleshooting between the U.S. Air Force Integrated Air and Missile Defense planner and the C2BMC planner.

4.3   Battle Management

C2BMC includes BMD battle management functions for sensor management and weapon engagement coordination. Automated Battle Management Decision Aids support theater and regional level missile defense operations under direction of the Joint Forces Air Component Commander (JFACC) and Area Air Defense Commander (AADC).

4.3.1   Battle Manager Updates

The Contractor shall develop, integrate, test and maintain the C2BMC Battle Manager in S8.2-3 to support engagement coordination, to include displaying the active defense design, monitoring BMDS Elements' Health and Status, Operational Status, weapon inventory, asset location, weapon systems' engagement status reports (from Tactical Digital Information Link-Joint (TADIL-J) messages), monitor BMDS Element's track association in a launch event engagement status, and provide support to engagement decisions and execution of the C2BMC operators. The Contractor shall provide additional updates to the Battle Manager that includes, but not be limited to, updates to the Operator displays and alert applications for the HMI enabling positive control of the Battle Management capabilities, a management by exception (MBE) capability for EoR engagements, and Net-centric

data exposure over the SECRET Internet Protocol Router Network (SIPRNet) providing authorized users with BMD Situational Awareness through Defense Information Systems Agency's (DISA) Net-Centric Enterprise Services (NCES). The Contractor shall implement a Link 16/Joint Range Extension (JRE) interface with IBCS to support interoperability with the 2018 IBCS IOC system. The EoR concept impacts C2BMC in the Battle Management area and its sub elements (SRM and weapon coordination). The Contractor shall complete the work necessary for C2BMC to conduct initial EoR including implementation of:

- Link 16 Interface Change Proposals (ICP) (TM06-027; 08-043; 08-084; 09-008; 10-067; 11-008; 13-035)
- J7.7 association messages
- JREAP forwarding rules
- Significant object reporting on NPG-7 (Partial implementation of Link 16 ICP TM12-009, no processing of Data Update Requests (DURs) and no reporting on NPG-21)
- Ballistic missile correlation
- Mapping real objects
- Launch/impact point prediction reporting
- Random covariance
- J9.1/10.2 message changes
- Battlespace displays

4.3.2   SRM Updates

The Contractor shall update and maintain the C2BMC Sensor Resource Manager (SRM) to process AN/TPY 2 track data, threat discrimination data, and support engagement support tasks (ESTs). The Contractor shall document and implement infrastructure and design changes with the AN/TPY-2 interface and shall maintain the capability to interface with AN/TPY-2. The Contractor shall maintain the capability to process the interface Discrimination data for threat discrimination in C2BMC. Additionally, the Contractor shall support development of SRM settings for the operational system.

4.3.2.1   SRM Prioritization

The Contractor shall extend the SRM task prioritization schedule to account for EoR in engagement support tasking.

4.3.2.2   SRM EoR Resource Monitoring and Degradation

The Contractor shall develop the capability for SRM to use sensor and weapon system locations, capabilities, available resources, feedback from AN/TPY-2 and tasking priorities to determine sensor capability to support EoR engagements. The Contractor shall develop the capability for C2BMC SRM to adapt its taskings to ensure that graceful degradation limits the impact to the higher priority engagements.

4.3.3   Track Processing Evolution

The Contractor shall modify the C2BMC Track Processing sub-system to maintain the capability for C2BMC to create and update C2BMC System Tracks and associated Ballistic Launch Event Families from BOA track reports and radar track reports received from one or more BMDS radars or the BOA Processing Node while meeting performance requirements of the C2BMC Build D Specification. The set of Track Processing patches

required to update and maintain correlation and association performance will be jointly identified and selected by the Contractor and the Government through the ACT working group. The Contractor shall maintain the Master Track Server capability in each Region that synchronizes the track data in that same Region. The Contractor shall update the capability for C2BMC S8.2-3 to provide C2BMC System Tracks and associated Ballistic Launch Event Families to C2BMC for processing and display to local and remote users.

4.3.4   Link 16 Track Transmission

The Contractor shall develop the capability for C2BMC to transmit Link 16 system tracks to Aegis BMD to support launch, containment, threat classification and Target Object Map (TOM) development for EoR engagements.

4.3.5   Reserved   (System Control and Messaging)

4.3.6   Common Libraries

The Contractor shall maintain common libraries for network based common services. Functions such as clock management and log management shall be standardized throughout the enterprise. The Contractor shall maintain a set of libraries to support all Server Applications (Server, Clock).

4.3.7   ATOMS Interface Definition Language (IDL)

The Contractor shall maintain the ATOMS IDL. The ATOMS-IDL shall be used to define all internal C2BMC messages. The Contractor shall maintain and develop any new ATOMS messages related to BMDS data required for the proper operations of C2BMC. The Contractor shall maintain the ATOMS Messaging Engine (ME) to provide point-to-point and publish/subscribe messaging interfaces. The Contractor shall assess the need for any changes to support S8.2-3 capabilities to the ATOMS-IDL and the ATOMS interface. The Contractor shall obtain Government Contracting Officer and Program Manager's approval of these changes through Critical Design Review (CDR).

4.3.8   Net-Centric

The purpose of the NC2 Update is to incorporate S8.2-3 new capabilities into NC2. The Contractor shall update the NC2 interface, so that the message set that is published to DISA Enterprise Messaging is consistent with any ATOMS message changes and additions for S8.2-3.

4.3.9   Software and System Event Logging

The Contractor shall provide the capability to maintain a common library for the logging of software and system events which will be stored in a common repository.

4.4   Reserved   (Protection Capability (PROCAP)

4.5   Record and Playback (RnP)

The Contractor shall develop the capability for C2BMC to record and playback mission execution data for post-mission analysis and archiving. The Contractor shall provide a capability of recording situational awareness data. The Contractor shall ensure the format of the recorded data is compatible with industry standard Personal Computer media tools which allow Operator selectable playback commands (similar to digital video recorder

(DVR) capability). The Contractor shall provide the capability for C2BMC to provide a continuous loop recording (DVR-like) of all situational awareness display data with an Operator selectable "archive" command to save the current data block and start a new one without loss of data. The Contractor shall provide the capability for C2BMC to export this saved data block from the operational system for use by the operator on a different system.

4.6 BOA 6.1

The Contractor shall perform the work necessary to interface and integrate with the BOA Element of the BMDS as a sensor source to C2BMC for system track development and shall integrate, test, and verify this integrated capability to meet the requirements, specifications, and performance of the C2BMC system.

4.7 Network Communication Services

The Contractor shall assess the current S8.2-1 communications network for ability to support the S8.2-3 capabilities within the BMDS. The Contractor shall provide updates to the BMDS Communications Network (BCN) Interface Specifications (BCNIS) required to support the S8.2-3 requirements and capabilities which are incorporated into the Initial Requirements Review and Design TIM/CDR documentation.

4.7.1 Reserved   (GFS LHCT Satellite Communication (SATCOM) Services)

4.7.1.1 Reserved   (GFS LHCT Circuit Configuration Management)

4.7.1.2 Reserved   (Protected, Anti-Jam/Anti-Scintillation Wideband Net-Centric System (PAAWNS) Management Control (PMC))

4.7.2 System Control and Messaging

4.7.2.1 Reserved   (Infrastructure Updates)

4.7.2.2 Concurrent Test, Training and Operations (CTTO)

The Contractor shall update the message tagging developed under S8.2-1 to support new capabilities of S8.2-3, to enable the system to have the flexibility to be re-configured between test, exercise and operations without major system updates or significant downtime. The Contractor shall ensure all internal Messages are tagged (and filtered) based on Region, Functional Mode, Activity Type, and Activity Identification.

4.7.2.3   Reserved   **(Improve Processing Capacity)**

4.7.2.4   Reserved   **(Token Management Improvements)**

4.7.2.5   Reserved   **(Replication Network (Data Sync Replacement)**

4.7.2.6   Reserved   **(Database and App Server replacements (COTS)**

4.7.2.7   Reserved   **(Common Libraries (Network based))**

4.7.2.8   Reserved   **(Common Libraries (Software based))**

4.7.2.9   Reserved   **(Logging for Analysis, ICD)**

4.7.2.10   Reserved   **(Collect)**

4.7.2.11   Reserved   **(Record/Playback)**

4.7.2.12   Reserved   **(Web Page)**

4.7.2.13   Reserved   **(ADSI Support)**

4.7.2.14   Reserved   **(All External Messages through CNIP)**

4.7.2.15   Reserved   **(Migration from Multicast to TCP/IP)**

4.7.2.16   Reserved   **(Active Thread Health and Status)**

4.7.2.17   Reserved   **(Alert Upgrade (SysAdmin and Warfighter))**

4.7.2.18   Reserved   **(Multiple C2BMC Instances for Concurrent Events)**

4.7.2.19   Reserved   **(Data Separation Between Concurrent Events)**

4.7.2.20   Reserved   **(Exportable Situational Awareness)**

4.8   Cybersecurity

The primary purpose of Cybersecurity engineering is to support A&A and Mission Assurance (MA) of the S8.2-3 release. S8.2-3 Cybersecurity is required to be maintained per associated guidance outlined in table 4.8-1. All Cybersecurity controls shall be met, mitigated or a plan developed to obtain and maintain A&A of S8.2-3 systems with the agreed upon restriction that S8.2-3 will not include a technical refresh of the operating systems or a technical refresh of significant software COTS products. The required capabilities are identified in the following subsections (A124).

Table 4.8-1 Cybersecurity Guidance

Document #	Title
CJCSI 6510.01F	Information Assurance (IA) and Computer Network Defense
CNSSI 1253	Security Categorization and Control for National Security Systems
DoD Memorandum	Open Source Software in the Department of Defense
DoDM 5200.01, Volume 1	DoD Information Security Program: Overview, Classification, and Declassification
DoDM 5200.01, Volume 2	DoD Information Security Program: Marking of Classified Information
DoDM 5200.01, Volume 3	DoD Information Security Program: Protection of Classified Information
DoDM 5200.01, Volume 4	DoD Information Security Program: Controlled Unclassified Information
DoDD 5200.2	DoD Personnel Security Program
DoDI 8500.01	Cybersecurity
DoDI 8510.01	Risk Management Framework (RMF) for DoD Information Technology
DoDD 8530.1	Computer Network Defense (CND) Directive
DoDI 8551.01	Ports, Protocols, and Services Management (PPSM)
DoD 8580.1	Information Assurance (IA) in the Defense Acquisition System
MDA Instruction 8430.01-INS	Software Acquisition
MDA Plan 8500.02-P	Information Assurance Program Plan
NIST SP 800-27 A	Engineering Principles for Information Technology Security (A Baseline for Achieving Security)
NIST SP 800-37	Guide for Applying the Risk Management Framework to Federal Information Systems: A Security Life Cycle Approach
NIST SP 800-53	Security and Privacy Controls for Federal Information Systems and Organizations
NIST SP 800-53A	Guide for Assessing the Security Controls in Federal Information Systems and Organizations: Building Effective Security Assessment Plans
NIST SP 800-61	Computer Security Incident Handling Guide
NIST SP 800-64	Security Considerations in the System Development Life Cycle
NIST SP 800-70	National Checklist Program for IT Products—Guidelines for Checklist Users and Developers
NIST SP 800-137	Continuous Monitoring
NIST SP 800-160	System Security Engineering

4.8.1 Cybersecurity Design

The Contractor shall conduct Cybersecurity Design to ensure increased 8.2.3 capabilities include appropriate Cybersecurity requirements and are approved by the C2BMC ISSM, AWG, the C2BMC ICCB, and the C2BMC Program Office, and are subsequently incorporated into the C2BMC system design. The Contractor shall work closely with internal Functional Areas and Government Cybersecurity engineering offices and boards to ensure that Cybersecurity controls listed in NIST Special Publications 800-53 and CNSSI 1253, USCYBERCOM and MDA/CERT Communications TO (CTO), and applicable STIGS/IAVMs are included. All Cybersecurity Design will conform to and follow the processes defined in the associated guidance outlined in table 4.8-1.

4.8.2 Cybersecurity Engineering

The Contractor shall conduct Systems Security Engineering in accordance with Best Practices and those guidelines provided in the guidance outlined in table 4.8-1. The Contractor shall interface with internal Functional Areas to ensure that Cybersecurity requirements have been identified and properly integrated into the system design. The Contractor shall support Government related engineering meetings, forums, boards as required, and Configuration Management boards and processes, to ensure that Cybersecurity is adequately and properly integrated into the system design. The Contractor shall report on the progress of Cyber engineering in the monthly progress report.

4.8.3 Cybersecurity Architecture Development

The Contractor shall evaluate new S8.2-3 C2BMC element specifications which are based on RMF technical requirements as designated by MDA/BCE. The Contractor shall use the program SMR process to provide MDA/BC and the C2BMC ISSM courses of action (COA), to include required timeline, for implementation of each evaluated requirement. The Contractor shall implement approved technical requirement COAs as prioritized by MDA/BC.

The Contractor shall conduct Cybersecurity architecture development in concert with the internal processes and interfaces with various Functional Areas, and in accordance with the guidance included in table 4.8-1, to ensure that the 8.2.3 system architecture includes, or has approved mitigations of Cybersecurity Controls. The Contractor shall coordinate with the Cyber Protection Teams, MDA CNDSP/CERT, BMDS Tier 2 CNDSP, and other BMDS Tier 3 groups. The Contractor shall document these Cybersecurity architectures in the form of architecture drawings to include sufficient descriptive data to support decision makers (CDRL A026).

4.8.4 Cybersecurity Updates

The Contractor shall assess, analyze, update documentation and provide technical changes as appropriate for STIG compliance to support S8.2-3 once during PoP. The Contractor shall assess, analyze, update documentation and provide technical changes as appropriate for the SW/HW compliance to include End of Support / End of Service / End of Life issues. The Contractor shall assess, analyze the effectiveness, and update the security tools supporting S8.2-3. The Contractor shall assess, analyze, and update the C2BMC Spiral Specification requirements to reflect NIST SP 800-53 to support S8.2-3. The Contractor shall implement the approved C2BMC Spiral Specification requirements and perform verification testing of the requirements using test processes described in section 4.1.16 and section 4.1.18.

4.8.5   Reserved   (Cybersecurity Tools)

4.8.6   System Security Plan

The Contractor shall develop and maintain the System Security Plan IAW NIST SP 800-53 (CDRL A124).

The System Security Plan will include:

- System Information Plan (SIP)
- Implementation Plan (IP)
- The System Security Plan will contain artifacts addressing the following policies and procedures IAW NIST SP 800-53
  - Access Control Policy and Procedures (AC)
  - Audit Account Policy and Procedures (AU)
  - Security Awareness Training Policy and Procedures (AT)
  - Configuration Management Policy and Procedures (CM)
  - Contingency Planning Policy and Procedures (CP)
  - Identification and Authentication Policy and Procedures (IA)
  - Incident Response Policy and Procedures (IR)
  - Maintenance Policy and Procedures (MA)
  - Media Protection Policy and Procedures (MP)
  - Personnel Security Policy and Procedures (PS)
  - Physical Environment Protection Policy and Procedures (PE)
  - Security Planning Policy and Procedures (PL)
  - Information System Program Plan (PM)
  - Risk Assessment Policy and Procedures (RA)
  - Security Assessment and Authorization Policy and Procedures (CA)
  - System and Communications Protection Policy and Procedures (SC)
  - System and Services Acquisition Policy and Procedures (SA)
  - System and Information Integrity Policy and Procedure (SI)

4.8.7   C2BMC Windows 10 Migration

The Contractor shall continue with updates to the C2BMC internal and external client software to support S8.2-3 development, integration and test, and deployment activities. The Contractor shall conduct code and unit testing and development regression testing for changes required to support Windows 10 internal and external client migration. C2BMC internal clients include CWS, Rel. WS, MWS and ADSI WS. C2BMC external clients include Planner, UI/UC, and NC2.

The Contractor shall conduct verification testing of the Windows 10 client effort NLT December 30, 2017. The Contractor shall conduct IA patching for Windows 10 to support STIG baseline throughout the development and verification of the Windows 10 effort.

The Contractor shall provide weekly status of the C2BMC client development , test and deployment activity. This information may be included in regular weekly reporting.

4.8.8   C2BMC Windows Server

The Contractor shall execute prototyping and assessment for Windows Server 2016. This effort shall support all C2BMC mission components running Windows software. The Windows Server prototyping shall include analysis effort to obtain a more accurate development and deployment estimate to support Windows Server upgrade coincident with S8.2-5 development and deployment.

The Contractor shall coordinate the approval of DSS Server 2016. The Contractor shall update server 2016 Image with DISA STIGS. The Contractor shall prototype and assess all C2BMC applications compatibility with Windows 10/Server 2016.

The Contractor shall conduct a Windows Server C2BMC Mission Components prototyping and assessments results TIM NLT April 1, 2018. The Contractor shall provide the results of the server prototyping assessment to the Government NLT 10 days following the conclusion of the TIM. These results shall include a description of the code and unit testing effort associated with any changes required to support successful client migration, IA patching required, and development regression testing estimates.

The Contractor shall provide weekly status of the C2BMC client development , test and deployment activity. This information may be included in regular weekly reporting.

The Contractor shall provide a Windows Server assessment plan for Government approval NLT 1 Dec 16.

4.9   Modeling and Simulation

The Contractor shall refine and use a combination of GFE/GFI and Contractor developed M&S tools. New M&S tools will be developed only when no other cost effective options exist. The tools shall be employed to verify and validate design and implementation concepts for C2BMC to ensure functional and performance requirements (such as utilization, loss, latencies and other behavioral specifications) of the element/spiral specification are addressed and met. The Contractor shall ensure M&S tools are developed to be compatible with or an extension of existing GFE M&S tools. The Contractor shall work closely with the MDA M&S Organization and the BMDS Elements to maximize the use of Government sponsored M&S development to support C2BMC development and minimize cost. The Contractor shall collect, define, and track BMDS M&S capabilities and requirements consistent with the S8.2-3 capabilities and the need to support S8.2-3 development, integration, and test. The Contractor shall ensure that all plans associated with model acquisition are consistent with and complementary to the C2BMC Government Program Plan (PP) and the Program IMS. All plans associated with model acquisition shall comply with all DoD 8500 IA policies to support BMDS events.

4.9.1   M&S Installation and Operations Support

The Contractor shall design, acquire, and maintain the computing environments necessary for execution/use of the M&S tools to support the Contractor and Government test programs.

The Contractor shall provide installation and Help Desk support of required M&S tools and scenarios deployed in each of the labs to support Contractor and Government experimentation, development, test, integration, and analysis.

4.9.2   BMDS Modeling

The Contractor shall collect, define, and track modeling and simulation capabilities and requirements consistent with the S8.2-3 capabilities and need to support Spiral development, integration, and test. The Contractor shall collaborate with the Government and other MDA offices as necessary, to incorporate capabilities and requirements in system level M&S tools and then test and evaluate those tools to verify their correct implementation. The Contractor shall document and provide C2BMC-unique M&S requirements directly to the Government M&S development team.

The Contractor shall coordinate with the Government to ensure the required BMDS System level simulation capabilities are prioritized and implemented consistently with the C2BMC System software implementation sequence. The Contractor shall develop a list of required capabilities for S8.2-3 that may result in required upgrades to the BMDS simulation.

The Contractor shall track threat development and BMDS capability definitions to develop scenario definitions for implementation in modeling and simulation tools. The Contractor shall use source data for scenario definitions and threat characteristics that includes, but not limited to: the Adversary Data Package (ADP); Adversary Capabilities Document (ACD); and other pertinent threat and BMDS lay down information from MDA and the MDA Engineering Team – Industry (MET-I). The Contractor shall ensure that all scenarios are composed of threat types consistent with those identified in the threat baseline within the BMDS System Specification and the C2BMC Build D Specification. The Contractor shall provide a set of scenarios which will be used to support C2BMC development, verification of C2BMC requirements, and to conduct analyses and assessments. The Contractor shall emphasize scenario optimization to ensure adequate performance and to support testing requirements throughout the entire C2BMC lifecycle; including BMDS level test events, wargames, and exercises.

4.9.3   C2BMC Modeling

The Contractor shall design and develop the BCM with the required S8.2-3 capabilities. The Contractor shall perform software design, coding, unit testing, and cycle integration and testing of the BCM which provides high fidelity representation of C2BMC functionality such that the model can be used for C2BMC performance evaluations, analysis, and test event predictive analysis. The Contractor development shall include Configuration Management (CM) of the code and released versions, generation of associated documentation, and maintenance/sustainment of BCM and the hardware on which it is hosted. The software source code, build instructions and scripts, executable(s), installation instructions and scripts, and documentation shall be included (CDRL A029).

4.9.4   BCM S8.2-3 Verification and Validation (V&V) Plan

The Contractor shall perform V&V of BCM S8.2-3 to support accreditation. V&V execution shall include development of a V&V Plan briefing (that includes performance parameters and acceptability criteria) deliverable at Test Readiness TIM, collection/generation of referent and associated BCM data, development of new tools where required, maintenance of a repository of V&V results (including BCM SMRs) and development of a V&V results briefing as entrance criteria to SRR.

4.10 Integrated Logistics Support

4.10.1 C2BMC Training Development

The Contractor shall develop initial operator training for the S8.2-3 systems. The Contractor shall include: development of S8.2-3 users manuals and training materials (including instructor's guides). The Contractor shall develop the S8.2-3 training curriculum (to complete 30 days prior to GTI) using an integrated approach that works in conjunction with the Development Functional Area Software User's Manual (SUM), SMR processes, the Warfighter Involvement Process (WIP) and the HFE working group. The Contractor shall conduct Warfighter Training 30 days prior to GTI & GTDs (CDRL A130).

4.10.2 Logistics Support

The Contractor shall provide updated technical documentation, OPSCON, operating instructions, and troubleshooting procedures to reflect changes based on the S8.2-3 software release.

4.10.3 Reserved   (Supply Chain Management)

4.10.4 Reserved   (Reliability, Availability, Maintainability Engineering)

4.10.5 Reserved   (Obsolescence Engineering)

4.11 S8.2-3 Deployment Planning and Fielding

The Contractor shall develop an S8.2-3 detailed system software Deployment Plan which shall include the plan from SRR through testing to provide cost and schedule data necessary to complete the MDA PCB prior to the deployment of S8.2-3 and the required planning necessary to support the software deployment, site activation, and installation/checkout of S8.2-3 at the CCMDs. The Contractor shall include, but not be limited to, planning, integration and checkout, and software transition.

The deployment of S8.2-3 will be a phased deployment. The transition from S6.4 in EUCOM/CENTCOM and S8.2-1in NORTHCOM/PACOM to S8.2-3 shall be planned as a phased transition with a Parallel Staging Network (PSN) (as required). EUCOM/CENTCOM will remain on S6.4 until S8.2-3 is fielded. The Contractor shall transition from S6.4 to a S8.2-3 Dual Combatant Command architecture, once S8.2-3 is ready for fielding. NORTHCOM/PACOM will remain on S8.2-1 until transitioned to S8.2-3. The S8.2-3 Deployment Plan milestone is the PAA III Technical Capability Declaration. The Contractor shall deliver initial S8.2-3 Deployment Plan at S8.2-3 CDR..

The Contractor shall provide the updated S8.2-3 Deployment Plan to include the Troubleshooting Procedure installation plan at the Ship Readiness Review (SRR) and Assessment Reports/Analysis Reports as required.

4.11.1 Deployment Planning

The Contractor shall perform detailed system deployment planning for S8.2-3 to include maintaining S6.4 and S8.2-1 operations during the parallel staging. Deployment planning shall include integration required with the internal and external elements and will be compliant with the Architecture Framework. The Contractor shall develop engineering solutions required to maintain capabilities during transition from S6.4 and S8.2-1 to S8.2-3, to include Cross-AOR data feeds, and other gaps identified in S8.2-3 Transition Plan. The Contractor shall provide on-site engineering support for deployment and transition.

4.11.2   Reserved   (Drawings)

4.11.3   Pre-Deployment Documents

The Contractor shall develop security and authorization documents IAW Government direction. The Contractor shall upload A&A documents to the classified Defense Systems Information Agency (DISA) Enterprise Mission Assurance Support System (eMASS) IAW Government direction. The RMF format shall be used (CDRL A124).

The Contractor shall update Facilities Requirements Documentation for all locations requiring facility modifications from the 6.4 and S8.2-1 baselines to accommodate the S8.2-3 baseline which shall be included in the S8.2-3 Deployment Plan.

The Contractor shall deploy fielded applications which are configured for automated updates IAW local deployment site configurations.

4.11.4   System Deployment

The Contractor shall perform system software deployment for S8.2-3 at all COCOMs and supporting locations. The Contractor shall integrate deployment across Functional Areas and collaborate with the appropriate Government organizations. The Contractor shall develop the overall S8.2-3 Deployment Plan, schedule and, upon deployment, provide weekly status to S8.2-3 Program Manager.

4.11.4.1   Site Installation

The Contractor shall conduct a Software Deployment technical interchange meeting prior to shipping software to a site to ensure readiness of the site and the software. The Contractor shall provide a Software presentation that includes known issues with the software release, installation approach for the release, timelines for installation, integration, testing of the release; coordination with Operation and Sustainment (O&S) personnel for the proposed installation; and agreement by the Government for the release. The Contractor shall support an Operational Readiness TIM between GTD and TCD.
The Contractor shall support the PCB decision milestone by sharing current program status, test status, and capability assessment findings with stakeholder organizations, including warfighters and other BMDS Element organizations.
  The Contractor shall verify changes to baseline engineering documentation and ensure changes are documented per C2BMC processes.

4.11.4.2   Deployed Site System Level Distributed Verification

The Contractor shall develop, install, test, and check-out (verify installation is correct and operating as intended) S8.2-3 SW while maintaining the 6.4 and S8.2-1 SW configurations at appropriate CCMD AOR locations. The Contractor shall provide all test plans, and test results from system level distributed verification upon completion of testing to the Government.

4.11.4.3   Site Upgrades and Enhancements

The Contractor shall design, deploy and conduct system Software Installation and Check-Out (INCO) for the complete S8.2-3 SW system at each site as specified per the S8.2-3 deployment plan. The Contractor shall support an Operational Readiness TIM between GTD and TCD for acceptance of deployed sites.

4.11.4.4   Transition Planning

The Contractor shall develop and execute a S8.2-3 transition plan, to include all Continental United States (CONUS)/Outside the Continental United States (OCONUS) locations, that ensures a successful transition to the new baseline. Cycle 1-5 testing shall encompass detailed plans (schedule, cost, personnel) to complete integration and successful check-out of S8.2-3 equipment at locations as specified in the S8.2-3 Software (SW) Transition Plan.

5.0   PERIOD OF PERFORMANCE

Award through 30 September 2019.

6.0   TRAVEL

The Contractor shall travel as required to participate in meetings, conferences, program reviews, technical interchanges, and test events to accomplish the work described in this TO. Costs associated to travel shall be in accordance with Federal Acquisition Regulation (FAR) Part 31.205-46.

7.0   SUPPORT REAL WORLD OR CONTINGENCY OPERATIONS

The Contractor shall execute special emphasis tasks that include implementation of technical study results or recommendations; analyses, assessments, and reports; issue resolutions for C2BMC; procurement of material; software updates/engineering releases; facility changes, and training. The Contractor shall maintain flexibility to call upon various degrees and types of support. Support could entail supporting mission priorities, real world deployments, and contingency events both CONUS and OCONUS. Results shall be delivered to the Government Contracting Officer and Program Manager IAW instructions in the Task Instruction(s).

8.0   GOVERNMENT FURNISHED AND CONTRACTOR ACQUIRED PROPERTY

All Government Furnished Items (GFx) associated to this TO are identified in "Attachment 4 – Government Furnished Information/Services/Facilities/Property" and "Attachment 9 – Master Government Property List" of the basic Contract.

9.0   CRITICAL MILESTONES

Milestone	Purpose	Date
Initial Requirements Review and Design TIM	Requirements Review (CSS Review) and Initial Design Review	25 May 2016
CDR	Critical Design Review	2/3 November 2016
S8.2-3 Test Readiness TIM	Verification Testing	19 July 2017
Ship Readiness Review	Release for GTI 07b	16 February 2018

10.0   DELIVERABLES

The following identifies the required CDRL deliverables associated with this TO.

CDRL #	CDRL Title
A013	Interface Control Documents (ICD)
A015	C2BMC Spiral Specifications (CSS)
A019	TPM Management Plan
A026	DoD Architecture Framework Documentation
A029	Model & Simulation Source Software and Object Code
A042	Executable and Source Code
A044	Software Data/Documentation
A048	Requests for Waivers and Deviations
A124	Risk Management Framework (RMF) Package
A130	Training Curriculum
A142	Software Resources Data Report & Data Dictionary (Initial)
A143	Software Resources Data Report & Data Dictionary (Final)

The following deliverables require Government acceptance through Wide Area Work Flow (WAWF) Receiving Reports:

- S8.2-3 Operational Software (CLIN 0201)   IAW CDRL A042 and A044.
- Planner Software (CLIN 0202)   IAW CDRL A042 and A044.
- S8.2-3 BMDS C2BMC Model (BCM) (CLIN 0203)   IAW CDRL A029.

The Contractor shall ensure the C2BMC operational capabilities include completion of fielding efforts during this period of performance. The Contractor shall deliver the Cycle 5 Test Reports as Receiving Reports via Wide Area Work Flow (WAWF) for Government approval confirming successful completion of the fielding events listed below. Acceptance

criteria for the receiving reports is successful Cycle 5 Testing as evidenced by all objectives rated green or acceptable for BMDS testing.

The Contractor shall complete the S8.2-3 fielding efforts listed below:

- Completion of S8.2-3 EUCOM Primary Side fielding 21 calendar days prior to FTO-03 E1.
- Completion of S8.2-3 EUCOM Primary and Secondary Side and CENTCOM Primary and Secondary Side fielding 7 calendar days prior to GTD-07b E/C.
- Completion of S8.2-3 NORTHCOM Secondary Side and PACOM Secondary Side fielding 7 calendar days prior to GTD-07b N/P.
- Completion of S8.2-3 NORTHCOM Primary Side and PACOM Primary Side fielding after S8.2-3 Technical Capability Declaration but no later than 30 September 2019.

11.0   ACRONYM LIST

AADC	Area Air Defense Commander
AAMDC	Army Air & Missile Defense Command
AARDVARC	ALDD Relational Database for Verification, Analysis, Reporting, & Collection
ABMD	Aegis Ballistic Missile Defense
ACD	Advanced Concepts Development
ACT	Algorithms Collaboration Team
ADP	Adversary Data Package
ADSI	Air Defense Systems Integrator
ALDD	Analysis Log Description Document
AMDWS	Army Air and Missile Defense Workstation
AOC	Air & Space Operations Center
API	Application Protocol Interface
ASEMP	Architecture and System Engineering Management Plan
A&A	Assessment and Authorization
ATOMS	Adaptable Toolkit for Open Message Service
AWG	Assessment Working Group
BCM	BMDS C2BMC Model
BCN	BMDS Communications Network
BCNIS	BMDS Communications and Network Implementation Specifications
BCR	Baseline Change Request
BDR	BMDS Discrepancy Report
BMD	Ballistic Missile Defense
BMDS	Ballistic Missile Defense System
BMDSS	Ballistic Missile Defense System Specification
BOA	BMDS Overhead Persistent Infra-Red (OPIR) Architecture
BOM	Bills of Material
BSAT	BMDS Systems Assessment Team
C&P	Characteristics and Performance
C2BMC	Command and Control, Battle Management and Communications
CES	C2BMC Build D Element Specification

CCB	Configuration Control Board
CCMD	Combatant Command
CDR	Critical Design Review
CDRL	Contract Deliverables Requirements List
CIXS	Common IAMD XML Schema
CM	Configuration Management
CMP	Configuration Management Plan
CND	Computer Network Defense
COA	Course of Action
CONUS	Continental United States
COTS	Commercial Off the Shelf
C/SERT	C2BMC Cost/Schedule Executive Round Table
CSM	C2BMC System Management
CSS	C2BMC Spiral Specifications
CWBS	Contractor Work Breakdown Structure
DAL	Data Accession List
DCN	Document Change Notice
DISA	Defense Information Systems Agency
DOORS	Dynamic Object Oriented Requirements System
DTAPS	Detailed Test & Analyses Procedures
DVR	Digital Video Recording
ECCS	External Command Center Systems
EIA	Exciter Isolation Assembly
eMASS	Enterprise Mission Assurance Support Service
EoR	Engage-on-Remote
EVMS	Earned Value Management System
FAR	Federal Acquisition Regulation
FBM	Forward-Based Mode
FOSS	Free and Open Source Software
GFE	Government Furnished Equipment
GFI	Government Furnished Information
GFx	Government Furnished Items
GMD	Ground Based Midcourse Defense
GOTS	Government Off-The-Shelf
GT	Ground Test
GTX	Ground Test Experimental
HFE	Human Factors Engineering
HMI	Human Machine Interface
HW	Hardware
HWIL	Hardware in the Loop
IA	Information Assurance
IAMD	Integrated Air and Missile Defense
IAVM	Information Assurance Vulnerability Management
IAW	in accordance with
IBCS	Integrated Air and Missile Defense Battle Command System
IBR	Initial Business Review

ICCB	Incremental Configuration Control Board
ICD	Interface Control Documents
ICP	Interface Change Proposals
ID	Identification
IDD	Interface Description Document
IDIQ	Indefinite Delivery/Indefinite Quantity
IDL	Interface Definition Language
IEEE	Institute of Electrical and Electronics Engineers
IMAP	Integrated Master Assessment Plan
IMD	Integrated Missile Defense
IMS	Integrated Master Schedule
IMTP	Integrated Master Test Plan
INCO	Installation and Check-Out
IPPD	Integrated Process and Product Development
IPT	Integrated Product Team
ISC	Integration Synchronization Center
ISG	Integration Synchronization Group
JFACC	Joint Forces Air Component Commander
JFCC	Joint Functional Component Command
JMS	JSpOC Mission System
JREAP	Joint Range Extension Application Protocol
JSpOC	Joint Space Operation Center
MAP	MDA Assurance Provision
MBE	Management by Exception
MD	Missile Defense
ME	Messaging Engine
MET-I	MDA Engineering Team – Industry
MIDB	Modernized Integrated Data Base
MIPS	Maritime IAMD Planning System
NATO	North Atlantic Treaty Organization
NC2	Net-centric Command and Control
NCES	Net Centric Enterprise Services
NCR	Network Change Request
NIST	National Institute of Standards Technology
NORTHCOM	Northern Command
NPG	Network Participation Group
O&S	Operations and Support
OCONUS	Outside the Continental United State
OPIR	Overhead Persistent Infrared
OPSCAP	Operational Capability
OPSCON	Operations Concept
PAA	Phased Adaptive Approach
PCB	Program Change Board
PIT	Product Integration Team
PMR	Program Management Review
POA&M	Plan of Action and Milestones

PP	Program Plan
PR	Problem Reports
PSN	Parallel Staging Network
RFD	Requests for Deviation
RFW	Requests for Waiver
RMF	Risk Management Framework
SBIRS	Space Based Infrared System
SCAR	Spiral Capability Assessment Report
SCM	Software Configuration Management
SCN	Specification Change Notice
SCVP	Spiral Capability Verification Plan
SDK	Software Developers Kit
SDP	Software Development Plan
SII	Special Interest Items
SIP	System Information Plan
SIPRNet	SECRET Internet Protocol Router Network
SMR	System Modification Request
SOW	Statement of Work
SQA	Software Quality Assurance
SRM	Sensor Resource Management
SRR	Ship Readiness Review
STD	Standard
STIGS	Security Technical Implementation Guides
SUM	Software User Manuals
SW	Software
TADIL	Tactical Digital Information Link
TAV	Test, Assessment, and Verification
TBL	Technical Baseline
TCD	Technical Capability Declaration
TDR	Test Discrepancy Report
TIM	Technical Interchange Meeting
TO	Task Orders
TOM	Target Object Map
TP	Troubleshooting Procedure
TPM	Technical Performance Measures
UC	Unified Client
WIP	Warfighter Involvement Process
XML	Extensible Markup Language