

**AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT**

1. Contract ID Code  
Cost-Plus-Fixed-Fee

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2. Amendment/Modification No. P00009	3. Effective Date 2013FEB28	4. Requisition/Purchase Req No. SEE SCHEDULE	5. Project No. (If applicable)
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6. Issued By U.S. ARMY CONTRACTING COMMAND ROBERT SAMPSON WARREN, MICHIGAN 48397-5000 HTTP://CONTRACTING.TACOM.ARMY.MIL  EMAIL: ROBERT.SAMPSON1@US.ARMY.MIL	Code W56HZV	7. Administered By (If other than Item 6) DCMA DALLAS 600 N PEARL STREET SUITE 1630 DALLAS TX 75201-2843	Code S4402A
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8. Name And Address Of Contractor (No., Street, City, County, State and Zip Code) RAYTHEON COMPANY 2501 W UNIVERSITY DR MCKINNEY, TX 75071-2813	<input type="checkbox"/>	9A. Amendment Of Solicitation No.
	<input type="checkbox"/>	9B. Dated (See Item 11)
	<input checked="" type="checkbox"/>	10A. Modification Of Contract/Order No. W56HZV-12-C-0046
	<input type="checkbox"/>	10B. Dated (See Item 13) 2012APR16
Code 96214	Facility Code	

**11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS**

The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers

is extended,  is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing items 8 and 15, and returning \_\_\_\_\_ copies of the amendments; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. **FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.** If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

**12. Accounting And Appropriation Data (If required)**

NO CHANGE TO OBLIGATION DATA

**13. THIS ITEM ONLY APPLIES TO MODIFICATIONS OF CONTRACTS/ORDERS  
It Modifies The Contract/Order No. As Described In Item 14.**

<input type="checkbox"/>	A. This Change Order is Issued Pursuant To: The Contract/Order No. In Item 10A.	The Changes Set Forth In Item 14 Are Made In
<input type="checkbox"/>	B. The Above Numbered Contract/Order Is Modified To Reflect The Administrative Changes (such as changes in paying office, appropriation data, etc.) Set Forth In Item 14, Pursuant To The Authority of FAR 43.103(b).	
<input checked="" type="checkbox"/>	C. This Supplemental Agreement Is Entered Into Pursuant To Authority Of:	52.243-2 CHANGES COST REIMBURSEMENT
<input type="checkbox"/>	D. Other (Specify type of modification and authority)	

**E. IMPORTANT:** Contractor  is not,  is required to sign this document and return \_\_\_\_\_ copies to the Issuing Office.

**14. Description Of Amendment/Modification (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)**

SEE SECOND PAGE FOR DESCRIPTION

Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. Name And Title Of Signer (Type or print)	16A. Name And Title Of Contracting Officer (Type or print) MEGHAN J. CUSTER MEGHAN.J.CUSTER@US.ARMY.MIL (586)282-9164		
15B. Contractor/Offeror  (Signature of person authorized to sign)	15C. Date Signed	16B. United States Of America By _____ /SIGNED/ (Signature of Contracting Officer)	16C. Date Signed 2013FEB28

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**Name of Offeror or Contractor:** RAYTHEON COMPANY

## SECTION A - SUPPLEMENTAL INFORMATION

Buyer Name: ROBERT SAMPSON  
Buyer Office Symbol/Telephone Number: CCTA-AIM-A/(586)282-9018  
Type of Business: Large Business Performing in U.S.  
Surveillance Criticality Designator: B  
Weapon System: No Identified Army Weapons Systems  
Kind of Modification: Supplemental Agreement

\*\*\* End of Narrative A0000 \*\*\*

PREVIOUS OBLIGATED AMOUNT:	\$21,321,977
THIS MOD:	\$ 0
CURRENT TOTAL OBLIGATED CONTRACT AMOUNT:	<u>\$21,321,977</u>
TOTAL ESTIMATED COST:	\$22,362,632

1. The purpose of Modification P00009 is to change the following:

## A. Section C

i. Section C.3.8.1.1. - Change the total number of ATWS turrets which will undergo Development Testing (DT) from a maximum of three (3) to all four(4) units.

ii. Section C.3.8.1.1. - Add language stating the remaining vehicle following Operational Testing will be used to support Integrated Logistics Support (ILS) efforts at the contractor's facility until scheduled for DT RAM testing at YPG.

iii. Section C.3.12.5. - Administrative change to correct reference to physical validation and verification from "fifteen (30) days" to "thirty (30)days".

## B. Section E

i. E.11.1. - Update all references to option CLIN 0002AB to also include CLIN 0002AC. Increase the maximum number of test assets if options are exercised from 3 to 4 vehicles. Specify Developmental Testing (DT) will last 9 months if both CLINs 0002AB and 0002AC are exercised. Change duration of DT performance and RAM testing from 2000 hours to 2656 hours.

## C. Section J: - update attachments as follows:

i. Attachment 0004: Government Furnished Property (GFE/GFI): Change date from 17 July 2012 and incorporate revision dated 13 February 2013. Revision adds 6 GFI items to the attachment.

ii. Attachment 0017: Safety System Program LAV-AT: Change date from 30 March 2012 and incorporate revision dated 16 December 2012. Change all references from MIL STD 882C to MIL STD 882D.

2. This modification represents final equitable adjustment for the changes herein. Any and all claims for adjustment beyond the terms set forth herein are waived and released.

3. As a result of this Modification, the total obligated amount of the contract is \$21,321,977. The total estimated cost is \$22,362,632.

4. Except as stated within, all other Contract terms and conditions remain unchanged and in full force and effect.

\*\*\* END OF NARRATIVE A0008 \*\*\*

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## SECTION C - DESCRIPTION/SPECIFICATIONS/WORK STATEMENT

C.1 SCOPE OF WORK

C.1.1 General Program Scope. This contract will satisfy the requirements to support all necessary activities contained within both the Engineering and Manufacturing Development (EMD) and Production and Deployment phases of the program. Under this contract the Contractor shall design, develop, integrate, test, provide field service representative (FSR) test support to government testing produce, manufacture, prepare and deliver associated documentation, provide technical support, training, and technical manuals, in accordance with the Performance Specification (P-Spec) (Attachment 0001), and the other provisions of this contract. The Contractor shall provide the necessary supplies and services as described herein to deliver Anti-Tank Weapon Systems (ATWS). The ATWS shall be packaged in a configuration to perform its functions within the existing LAV-ATA2 vehicle envelope. Upon successful completion of Developmental Test (DT) and Initial Operational Test and Evaluation (IOT&E) testing the government may exercise contract options for production.

C.1.2 Identification of Phase I & Phase II.

Phase I: The Engineering Manufacturing and Development Phase (Phase I) consists of all base award activities up to and including successful completion of Operational Testing (Section E.11).

Phase II: The Production Phase (Phase II) is initiated upon exercise of the first production option, CLIN 0004AA, and includes all effort required to satisfy production requirements including delivery of the Anti-Tank Weapon Systems (ATWS) .

C.2 APPLICABLE DOCUMENTS. The following documents form a part of this Statement of Work (SOW) to the extent specified herein. The most recent revision of the referenced document at the time of contract shall be used unless otherwise specified. In the event of conflict between the applicable documents and this SOW, the SOW shall take precedence. All second tier and below references cited in mandatory compliance documents shall be considered as guidance only. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

C.2.1 Military Standards and Specifications - Mandatory Compliance.

MIL-PRF-49506	Logistics Management Information
MIL-STD-129	Military Marking for Shipment and Storage
MIL-STD-461	Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment
MIL-STD-882	Standard Practice for System Safety
MIL-STD-1366	DoD Interface Standard for Transportability Criteria
MIL-STD-1472	Human Engineering
MIL-STD-2073-1	DoD Interface Standard for Transportability Criteria

C.2.2 Military Standards and Specifications - Guidance Only.

MIL-STD-1686	Electrostatic Discharge Control Program for Protection of Electrical and Electronics Parts, Assemblies and Equipment
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C.2.3 Federal Standard - Mandatory. Not Applicable

C.2.4 Drawings. Not Applicable

C.2.5 Handbooks - Guidance Only.

MIL-HDBK-61	Configuration Management Guidance
MIL-HDBK-189	Reliability Growth Management
MIL-HDBK-217	Reliability Prediction of Electronic Equipment
MIL-HDBK-338	Electronic Reliability Design Handbook
MIL-HDBK-470	Designing and Developing Maintainable Products and Systems

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MIL-HDBK-502	Acquisition Logistics
MIL-HDBK-759	Human Engineering Design Guidelines
MIL-HDBK-781	Reliability Test Methods, Plans, and Environments for Engineering Development, Qualification, and Production
MIL-HDBK-881	Work Breakdown Structures for Defense Materiel Items
MIL-HDBK-31000	Technical Data Packages

C.2.6 Other Government Documents. Unless otherwise stated, the following documents may be obtained from the Document Automation and Production Service, Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094 or visit <http://dodssp.daps.mil>.

DoDD 4650.1	Management and Use of the Radio Frequency Spectrum
DoDI 8500.2	Information Assurance (IA) Implementation
FED-STD-313	Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities
FED-REQ-49CFR	Title 49 -- Transportation
NAVSEAINST 9310.1	Naval Lithium Battery Safety Program
NTIA Manual	National Telecommunications and Information Administration
TM S9310-AQ-SAF-010	Technical Manual for Batteries, Navy Lithium Safety Program Responsibilities and Procedures

(Copies of TM S9310-AQ-SAF-010 are available from Naval Weapons Support Center, Code 3057, Building 36, Crane, IN 47522-5060.)

C.2.7 Non-Government Documents.

ASME 14.24M	Engineering Drawing Practices
ASME Y14.34M	Associated Lists
ASME Y14.100	Engineering Drawing Practices

(Copies of ASME documents are available from [www.asme.org](http://www.asme.org) or American Society of Mechanical Engineers Information Central Orders/Inquiries, P.O. Box 2300, Fairfield, NJ 07007-2300.)

ASTM D3951	Standard Practice for Commercial Packaging
ASTM D4169-01e1	Standard Practice for Performance Testing of Shipping Containers and Systems

(Copies of ASTM documents are available from [www.astm.org](http://www.astm.org) or American Society for Testing and Materials International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

EIA-625	Requirements for Handling Electrostatic Discharge-Sensitive (ESDS) Device
EIA-649	National Consensus Standard for Configuration Management
ANSI/EIA-748	Earned Value Management System

(Copies of EIA documents are available from [www.eia.org](http://www.eia.org) or Electronic Industries Alliance Corporate Engineering Department, 2500 Wilson Boulevard, Arlington, VA, 22201.)

IEEE/EIA 12207	Standard for Information Technology - Software Life Cycle Processes
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(Copies of IEEE/EIA 12207 are available from [www.ieee.org](http://www.ieee.org) or Institute of Electrical and Electronics Engineers Service Center, 445 Hoes Lane, Piscataway, NJ 08854-1331.)

NAS 411	Hazardous Materials Management Program
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(Copies of NAS 411 are available from www.aia-aerospace.org or Aerospace Industries Association of America, 1250 Eye Street, NW, Suite 1200, Washington, DC 20005-3924.)

## C.2.8 Forms.

DD Form 1494 Application for Equipment Frequency Allocation

Standard Form 368 Product Quality Deficiency Report

**C.3. REQUIREMENTS.** The Contractor shall perform all tasks required to design, develop, integrate, test, produce, manufacture, deliver and prepare associated documentation, provide logistic support, provide technical support, provide field service support, provide training, develop technical manuals and deliver the ATWS in the quantity specified in the contract. The Contractor shall provide all materials, equipment, hard tooling, personnel, and facilities necessary to manufacture, fabricate, integrate, produce, and deliver the types and quantities of deliverables specified by the contract. The ATWS shall be packaged in a configuration to perform its functions within the existing LAV-ATA2 vehicle envelope. During EMD Phase (Phase I), the Contractor shall design, integrate and deliver up to four (4) ATWSs that meet the requirements of the Performance Specification (P-Spec), Revision 3 dated 06-MAR 2012, and the other provisions of this contract. Two (2) of the EMD assets will be awarded with the base contract under contract line item number (CLIN) 0002AA. The remaining two (2) EMD assets will be awarded as options (one each under CLIN 0002AB and 0002AC) if exercised. Three (3) of the four (4) will be used for system level Developmental Test (DT) and Initial Operational Test and Evaluation (IOT&E) with the remaining one (1) used in support of Integrated Logistics Support (ILS) i.e. if both EMD options are exercised, the fourth vehicle will be a dedicated ILS asset through OT. The Contractor shall perform the necessary Design Verification Tests (DVT) to ensure the performance of the ATWS. The Contractor shall support both the Government performed Developmental Tests (DT) and Operational Tests (IOT&E). The resulting ATWS shall be producible and supportable and comply with the requirements contained within Attachment 0001 Performance Specifications. The ATWS shall include significant redundancy. The ATWS shall provide the following redundancies: (1) the ATWS shall have the ability to track and control a TOW missile using the thermal beacon of the missile tracker while the xenon beacon is nonfunctional. The ATWS shall have the ability to track and control a TOW missile using the xenon beacon of the missile tracker while the thermal beacon is nonfunctional; and (2) the ATWS shall provide the operator with the ability to manually traverse and elevate the LOS of the turret from the gunners station to allow the operator to survey, acquire, and engage targets while the system is in a degraded state. Upon successful completion of developmental test, operational test, the Government may exercise contract options for production and fielding resulting in the start of Phase II (Production phase).

C.3.0.1 The requirements for this program that are contained in this Scope of Work are applicable to BOTH Phase I Engineering Manufacturing and Development (EMD) and Phase II Production, unless otherwise specified.

C.3.0.2 Total System Responsibility. The Contractor shall have system and integration responsibility as defined herein. The Contractor shall assume total system responsibility for the LAV Anti Tank Modernization Program (ATMP). Total system responsibility is defined as the Contractor agreeing to accept responsibility for incorporating an ATWS that meets the requirements of the Performance Specification (Attachment 0001), and that does not degrade from the current performance of the LAV-ATA2 as set forth in the Family of Light Armored Vehicle Demonstrated Performance Specifications (Attachment 0002). Total system responsibility includes items that are subcontracted and/or Contractor furnished and specified by the Government by manufacturer's name, item description, or part number. Contractor responsibility for Government Furnished Equipment/Government Furnished Material (GFE/GFM) items is limited to any defects or performance degradation resulting from contractor integration of the item. The Contractor shall be responsible for Correction of Deficiencies (COD) as set forth in Section E; and for ensuring on-time delivery of all hardware and data deliverables under this contract.

C.3.0.3 LAV-AT Automotive Performance. Integration of the ATWS onto the LAV-ATA2 shall not degrade the required performance and protection level capabilities of the LAV ATA2 as defined in the Modified FOLAV Demonstrated Performance Specification (DPS). In the event there is a contradiction between the DPS and the Performance Specifications, the performance specification shall be controlling. The Contractor shall notify the government of any contradiction within fifteen (15) days for requirements clarification and direction.

C.3.0.4 Vehicle Integration. The Contractor shall be responsible for the integration of the ATWS into LAV-ATA2s (with BPUP Armor kits applied A, B, and C). The ATWS shall be designed to allow installation into any LAV-ATA2 (new build or legacy chassis) configured vehicle. Electrical, hydraulic and mechanical integration shall be achieved with no degradation of the baseline vehicle. The ATWS turret shall be integrated into the automotive structure in the same location as in the baseline vehicle. Structural and configuration modifications shall be minimized and shall require approval through acceptance of CDRL A033 (reference Section C.3.6.1.5).

C.3.0.5 Manufacturing Plan. The Contractor shall present an initial Manufacturing Plan at the Start of Work meeting. The Contractor shall present an updated Manufacturing Plan at the Critical Design Review (CDR). The following factors, shall be addressed in the updated plan: production process planning, identification of the production process sequence and critical control points, the interrelated lead-times between the control points, manpower utilization, tooling and facilities plans, current and expected workload during the ATWS performance period, subcontracting and the material requirements planning process to be used. During Phase II, the Contractor shall present a revised Manufacturing Plan at Phase II Start of Work Meeting to support training and installation efforts and integrate the changes into the Modification Instructions for depot installation of the ATWS.

C.3.0.6 Manufacturing, Installation and Shipping. The four (4) ATWS Production Representative Systems (PRS), used during the EMD phase

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(Phase I), shall be installed on LAV-ATA2s by the Contractor at the Contractors facility. For these four systems, contractor personnel shall remove the current M901 turret (if applicable) and related materials in preparation for the ATWS installation. The M901 turret and associated materials shall be shipped to Barstow, by the Contractor, (Project Code: PHA, Bldg 401 DODAAC: MMSA02) after removal from the vehicles. The Contractor shall install the ATWS into each vehicle system including all hardware, software, cables, harnesses, and interfaces. During the Production and Deployment phase (Phase II), the Contractor shall manufacture, produce and provide the ATWS, materials, initial spares, equipment and deliverables in the types and quantities as specified in the Schedule. After completion of ATWS assembly and kitting, the Contractor shall ship the production in accordance with the schedule. Shipments shall be coordinated to facilitate the installation plan (reference CDRL A012). The installation of the (up to) 114 ATWSs (118 total ATWS minus four (4) Production Representative assets) are planned to be performed at the Marine Corps Maintenance Centers. During Phase II, the Contractor shall present a revised Manufacturing Plan at Phase II Start of Work Meeting to support training and installation efforts and integrate the changes into the Modification Instructions for depot installation of the ATWS.

C.3.0.6.1 Installation Training - Phase II. The Contractor shall provide two retrofit installation training sessions for Marine Corps Logistics Base Maintenance Centers at Albany, Georgia and Barstow, California. Training shall commence no later than ten (10) days after the first production hardware arrives. The training shall be performed at both locations at different times and shall be limited to 30 students. The Contractor shall provide Installation Training Package IAW CDRL A001 Retrofit Installation Training. The training package shall consist of detailed installation instructions for the ATWS to be installed into the existing USMC LAV-ATA2 (new production and legacy). The training material shall cover the modification instructions (CDRL A066) and system troubleshooting. Training on weapons firing and ammunition handling are not required. The Government will provide the necessary facilities and common support items to support this training. The Contractor shall provide all special tools and equipment.

C.3.0.6.2 Contractor Inspection and Acceptance of Production - Phase II. The Contractor shall be responsible for performing all the required inspections on each ATWS at the Contractor(s) facilities prior to delivery. These inspections shall be performed per the requirements of section E, paragraphs E.13.9, E.13.10, E.13.12.

C.3.0.6.3 Production Line of Balance (LOB) Status - Phase II. The Contractor shall prepare and deliver on a monthly basis a report that displays the Production Line of Balance (LOB) status IAW CDRL A002 - Production Line of Balance (LOB) Status. The report should include the status of production activities related to the ATWS and its individual LRU's and vehicle modification components. The points of application within the manufacturing process of components and assemblies included in the LOB report shall be included in the production flow chart of the next higher assembly.

**C.3.1 PROGRAM AND DATA MANAGEMENT**

C.3.1.1 Program Management. The Contractor shall establish and maintain program management practices IAW CDRL A003 - Contractors Progress, Status and Management Report throughout the period of performance. Program management practices shall provide visibility into the Contractors organization and techniques used in managing the program, specifically subcontractor, and data management. Documentation shall be readily available to Government representative(s) during planned visits.

C.3.1.2 Risk Management Plan. The Contractor shall implement a Risk Management Plan. The initial set of Contractor-defined risks shall be updated as new risks are identified. The Contractor shall rank risks with respect to impact on performance, cost, and schedule and shall identify and develop risk mitigation plans for risk reduction and resolution. The Contractor shall describe its proposed risk management plan at the start of work meeting and shall follow the guidelines of the Risk Management Guide for DoD Acquisition, (Sixth edition, ver. 1) for format and MIL-STD-882 (DoD Standard Practice for Safety System) shall be utilized for hazard risks.

C.3.1.2.1 Risk Reporting. The Contractor shall maintain a risk management program to assess risks associated with achievement of performance, cost, and schedule requirements. Specific risk functions shall:

1. Identify known and potential risks.
2. Assess risks, including a relative ranking by program impact and the establishment of critical thresholds.
3. Define method or alternative to mitigate or minimize these risks, including the identification of criteria upon which programmatic decisions are based.
4. Track and report risk mitigation progress.

The Contractors risk management program shall be presented to the Government initially at the Start of Work Meeting and then updated IAW CDRL A004 Risk Management Status Report.

C.3.1.3 Data Management. The Contractor shall establish a single, centralized system for management of all data required under this contract. The Contractor, in developing information that will be furnished to the Government, shall make the maximum use of existing data and provide maximum multiple use of technical information. Any electronic databases or applications used to store, track, share, transmit or display information pertaining to this contract shall be web-based. Government use of any data management system shall not require installation of client software on Government computer systems (with the exception of Internet Explorer and Microsoft Office). Specific data management functions shall include schedule control for deliverables, maintenance of deliverables, approval of deliverable format, and distribution, and delivery of data products. The system shall include facilities for storage of all data developed or utilized for this contract, and shall provide equal access to data by the Government. The Contractor shall ensure all data is centrally

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available for Government review to ensure continuity of the system fabrication and supporting documentation. The Government reserves the right to review all data associated with and developed for the ATWS.

C.3.1.4 Schedule Planning. The Government will provide a Critical Milestone Schedule (reference Attachment 0003) consisting of high level milestones, technical reviews, and assessments for the ATWS program. As a requirement for the RFP, the Contractor constructed an Integrated Master Plan (IMP) consisting of an event driven plan that documents the significant accomplishments and criteria necessary to complete the work and ties each event to the Critical Milestone Schedule. The Contractor shall construct and maintain an Integrated Master Schedule, CDRL A007 Integrated Master Schedule (IMS). The IMS is an integrated and networked multi-layered schedule of program tasks required to complete the work effort captured in the related IMP submitted during RFP. The IMS should be defined to the level of detail necessary for day-to-day execution of the program. The Contractor shall notify the Government in writing of any anticipated or projected work stoppages or delays that will impact schedules. Reference MIL-HDBK-881A for additional guidance for IMP and IMS schedules. The IMP and IMS shall be updated by the Contractor on a continuing basis.

C.3.1.5 Assignment of Responsibility and Authority. The Contractor shall identify and present at all in-process program reviews and technical reviews, the organizational elements responsible for the conduct of the activities delineated in this SOW. Responsibilities shall be assigned and clear lines of authority defined for determining and controlling the resources necessary to satisfy each element of this SOW. The following billets shall be considered key personnel. The Contractor in writing shall appoint all persons filling these billets. The Contractor shall notify the Government within fifteen (15) days of any changes regarding authority, responsibility, or key personnel changes made by the Contractor during the period of performance.

1. Program Manager. The Contractor shall designate a Program Manager (PM) who shall possess sufficient corporate authority to manage, direct, execute and control all elements of the contract. The PM shall serve as the primary point of contact between the Contractor and the Government, and be responsible for the coordination of all contractor activities related to the contract.
2. Systems Engineer. The Contractor shall designate a Systems Engineer who shall possess sufficient authority to manage, direct, execute and control all engineering elements of the contract.
3. Test Engineer. The Contractor shall designate a Test Engineer who shall possess sufficient authority to manage, direct, execute and control all test and engineering elements of the contract.
4. Configuration Management (CM) Manager. The Contractor shall designate a CM Manager who shall possess sufficient authority to manage, direct, execute and control all CM elements of the contract.
5. Environment, Safety, and Occupational Health (ESOH) Manager. The Contractor shall designate an ESOH Manager. The person shall possess the authority to manage, direct, execute and control all environment, safety and occupational health elements of the contract.
6. Integrated Logistic Support (ILS) Manager. The Contractor shall designate an ILS Manager who shall possess sufficient authority to manage, direct, execute and control all ILS elements of the contract.
7. Quality Assurance (QA) Manager. The Contractor shall designate a QA Manager who shall possess sufficient authority to manage, direct, execute and control all quality elements of the contract.
8. Corrosion Engineer. The Contractor shall designate a Corrosion Management Engineer who shall possess sufficient authority to manage, direct, execute and control all corrosion related elements of the contract.
9. Training Manager. The Contractor shall designate a Training Manager who shall possess sufficient authority to manage, direct, execute and control all training related elements of the contract.

C.3.2 GOVERNMENT FURNISHED PROPERTY

C.3.2.1 Government Furnished Equipment. A complete list of Government Furnished Property (GFP) including Equipment, Information, and Materials that will be made available for the Contractor is contained in Attachment 0004. Items (other than the vehicles,) will be provided to the Contractor within sixty (60) days of receipt of Contractor's written request to the Program Managers Office for Marine Corp Light Armored Vehicles. The Contractor shall provide a receipt of Government Property Report IAW CDRL A009 Receipt of Government Property Report.

C.3.2.1.1 Vehicle Configuration. As identified in Attachment 0004 (Government Furnished Property (GFP)), the Government will provide the Contractor with four (4) LAV-ATA2 vehicles for the integration development effort. These vehicles shall consist of three (3) new builds without the M901 turrets installed and one (1) legacy vehicle with the M901 turret installed. All vehicles will be provided in Equipment Condition Code A.

C.3.2.1.2 Vehicle and MITAS Shipping. The Government will be responsible for shipping four (4) LAV-ATA2 and four (4) Modified Improved Target Acquisition Systems (MITAS) as GFP to the Contractor's facility within thirty (30) days after contract award.

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**Name of Offeror or Contractor:** RAYTHEON COMPANYC.3.3 MEETINGS, FORMAL REVIEWS, CONFERENCES AND AUDITS

C.3.3.1 Contractor Responsibilities. The Contractor shall plan, host, attend, coordinate, provide administrative support and conduct the meetings, formal reviews, conferences, and audits (hereinafter called "reviews"). The reviews shall be conducted at Government and Contractor facilities. When it is feasible, the Contractor is encouraged to conduct as many of the reviews in a video teleconferencing format as possible. Reviews requiring demonstration and examination of equipment shall be conducted at the Contractor's facility. All such reviews shall be included in the program schedule and may be held concurrently with the Government's approval. The Contractor shall prepare agendas and conference presentation materials IAW CDRL A010 Conference Agenda, and provide minutes and reports following each review IAW CDRL A011 Report, Record of Meeting/Minutes. The Government reserves the right to cancel any review or to require any review to be scheduled at critical points during the period of performance. Action item documentation, assignment of responsibility for completion and due dates shall be determined prior to adjournment of all reviews. A summary of all action items, responsible parties, and estimated completion dates shall be included with the minutes.

C.3.3.2 Meetings, Reviews and Conferences.

C.3.3.2.1 Start of Work Meetings - Phase I is a formal system-level review conducted to ensure that system requirements and program objectives have been completely and properly identified and that there is a mutual understanding between the Government and Contractor. It is intended to confirm that the users requirements have been translated into system-specific technological requirements, and that critical technologies are identified, required technology demonstrations are planned, and risks are well understood and mitigation plans are in place. Producibility and manufacturing considerations which could impact the program decision such as critical components, materials and processes, tooling and test equipment development, production testing methods, long lead items, and facilities/personnel/skills requirements should be addressed. The Systems Requirements Review 2 (SRR 2) shall be conducted as part of the start of work meeting phase I. The Contractor shall conduct a Start of Work meeting at his facility no later than thirty (30) days after contract award for approximately fifteen (15) government personnel. The Contractor shall provide the COR, Contract Specialist, and ACO a preliminary agenda 7 days prior to the start of work meeting.

The Contractor shall present the Program Management Plan as well as key personnel, program implementation processes, the contract schedule critical path network, the Contract Work Breakdown Structure (CWBS), the Risk Management Plan (per section C.3.1.2.), and the Quality Assurance Program Plan. The meeting shall also address:

1. Draft SEMP Review (per section C.3.4).
2. System Interface Study.
3. Preliminary Requirements Allocation.
4. Hazardous Materials Management Program and Pollution Prevention plan (HMMP & P2) (per section C.3.5.9.1).
5. Initial Manufacturing Plan (per section C.3.0.5).
6. Contractors Requirement Traceability Matrix.
7. Draft Contractor System Specification.
8. Software Technical Interchange meeting schedule (per section C.3.14.4).
9. Environmental, Safety and Occupational Health (ESOH) Planning.
10. Human Factors Analysis Planning.

C.3.3.2.2 Logistics Start of Work Meeting - Phase I. The Contractor shall conduct an ILS SOW meeting immediately following (the next business day) the completion of the Start of Work Meeting (reference C.3.3.2.1). The ILS SOW meeting shall last no longer than two (2) days. The Contractor shall review key ILS milestones for the program. Additional topics and processes to be discussed include:

1. Condition Based Maintenance and Maintenance Planning.
2. Contractor support requirements for DT and IOT&E and production tests.
3. Support Equipment (SE) development and identification
4. Tech Publication Data development process in accordance with the Technical Manual Contract Report TMCR and Technical data support (provisioning data, technical publications, engineering data for provisioning (EDFP) required under this contract (Reference sections C.3.1.0 and C.3.12).
5. Dates and times for Logistics Reviews.
6. Availability of ATWS Items, common tools, special tools, support equipment and bulk items and expandable items.
7. Obsolescence Management in accordance with PM-LAVs Diminishing Manufacturing Sources and Material Shortages Plan.
8. Software support.
9. Facilities Impact and Planning.
10. Design influence and integration efforts with System Engineering.
11. Packaging, Handling, Storage, and Transportation (PHS&T).
12. Configuration Management.
13. Reliability Data Development and Reporting Process.
14. Level of Repair Analysis (LORA) Development and Reporting Process.
15. Maintenance Allocation Chart to be developed based on LORA.
16. Reliability Centered Maintenance (RCM) Analysis.

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17. Recommended Repair Parts List (RRPL).
18. System Support Package (SSP) Component List.
19. Training plan of action and milestones to meet courseware updated development and training requirements.
20. Training aids, devices, systems, and simulations (TADSS).
21. ILS Program Risk Management. The Contractor shall brief any program risks that may affect the ILS effort. Risk items shall be analyzed according to program, cost, schedule, and performance. Risk items to be considered are any tasks that are a part of the ILS effort (i.e. TMs, provisioning, maintenance, CM).
22. Provisioning to include procedures for developing data and identifying long lead-time items.

C.3.3.2.3 Start of Work Meetings - Phase II. The Contractor shall conduct a Start of Work meeting at his facility no later than thirty (30) days after exercise of the Phase II Production option for approximately fifteen (15) government personnel. The Contractor shall present the Phase II Program Management Plan as well as the contract schedule critical path network, the Contract Work Breakdown Structure (CWBS), the Risk Management Plan and the Quality Assurance Program Plan.

C.3.3.2.4. Executive Workshop - Phase I. Within thirty (30) days after contract award, and immediately prior to the start of work meeting, Government and Contractor senior executives and managers shall conduct an Executive Partnering Workshop. At a maximum this shall be a one-day meeting. The purpose of this workshop is to establish lines of communication between upper management in both parties. The product of this meeting shall be an overarching Charter for the LAV-AT Modernization Program, including designation of senior-level and program-level "Champions." The "Champions" will be responsible for overseeing the project, enforcing the team approach, overcoming resisting forces, participating in the resolution of issues escalated to their level, celebrating successes, and maintaining a positive image for the project. The outputs of this session shall be presented to the entire team at the start of work meeting.

C.3.3.2.5 Team Workshop - Phase I. In conjunction with the start of work meeting, the Government and Contractor teams shall participate in a Workshop that shall last no longer than one (1) day. The purpose of the meeting is to conduct team building between the Government and Contractor team members at a mutually agreed upon location, and establish lines of communication. Products of the meeting to include:

1. The ATWS Charter (mission statement, goals, and objectives);
2. The Joint ATWS Risk Management Plan, identifying specific program risk areas, with a risk mitigation plan and Government and Contractor action officers for each;
3. Conflict escalation procedure (identifies methods of elevating disagreements for resolution within the Government and Contractor organizations);
4. Alternative Dispute Resolution (ADR) approaches;
5. Metrics for accomplishments of objectives;
6. Reinforcement Techniques;
7. Clear identification of roles and responsibilities for the team members.

C.3.3.2.6 In-Process Program Review (IPPR) - Phase I & II. In Process Reviews (IPPR) will be held on a quarterly basis or as needed basis, at a date and location mutually agreed upon. The Government reserves the right to cancel any review or to require any review to be scheduled during the period of performance. The Contractors progress, management, technical support services (if any), integrated logistics support, administrative, assurance of compliance with contract requirements, program status, funding, problem identification and resolutions shall be agenda items. Actual versus expected performance of each area shall be addressed. The Contractor shall prepare presentation materials providing an overview of all agenda items.

C.3.3.2.7 In-Process Design Review (IPDR) - Phase I. The Contractor shall conduct IPDRs at its facility or at a mutually agreeable subcontractor's facility on an every other month basis starting twenty (20) days after the Start of Work meeting. The purpose of these informal, working level meetings will be to assess the progress being made toward meeting the requirements of the P-Spec and this SOW to include ILS development. Topics which should be addressed at the IPDRs are the same as those covered in formal design reviews (PDR & CDR, reference C.3.3.3.2 and C.3.3.3.3). Duration of these meetings should not exceed two (2) working days. These meetings could be conducted via video-telecommunication if mutually agreeable to the Government and Contractor.

C.3.3.2.8 Contractor Coordination Efforts - Phase I. Within thirty (30) days after Critical Design Review (CDR) the Contractor shall meet, at a location that is mutually agreed upon, with PM-LAV and Marine Corps Logistics Command (MARCORLOGCOM), to discuss how best to coordinate Phase II installation training and support during depot installation of ATWS. The parties shall review the most efficient method to minimize schedule risk and maximize overall process efficiency. Within ninety (90) days after the meeting, the Contractor shall submit an updated process plan IAW CDRL A012 Installation Plan, (reference section C.3.0.6) reflecting agreements reached at the meeting. This document shall help the Government and the Contractor to perform initial forward planning for the installation phase. The Contractor shall continue to monitor this plan through Phase I, and provide any required modifications (based on the ongoing development effort) to the Government. Duration of this effort should not exceed five (5) working days.

C.3.3.2.9 Production Status Reviews - Phase II. The Contractor shall conduct a total of four (4) Production Reviews at its facility during Phase II. The Production Reviews shall last no more than one (1) day and will be attended by Government personnel. Production Status Review agenda shall include, current production schedule, any changes to current schedule, production risks, production dependencies, quality issues, and configuration changes.

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C.3.3.2.10 Test Incident Report (TIR) Closeout Meeting. Reference section E.11.5 for TIR Closeout Meeting requirements.

C.3.3.2.11 PVT - Test Incident Report (TIR) Closeout Meeting. Reference section C.3.8.28 for PVT-TIR Closeout Meeting requirements.

C.3.3.3 Technical Reviews.

C.3.3.3.1 System Functional Review (SFR) - Phase I. The SFR is a multi-disciplined technical review to ensure that the ATMP can proceed into preliminary design and that all system requirements and functional performance requirements derived from the Performance Specifications are defined and are consistent with cost, schedule, risk, and other system constraints such as design constraints, developmental constraints, and resource constraints peculiar to the system developed by the Contractor. System Functional Review (SFR) shall also be combined with the PDR. The SFR presentation shall cover the following elements:

1. The system functional and performance requirements are traceable to the system design approach and the Technical Work Breakdown Structure.
2. Review to ensure that the allocated baseline requirements satisfy all system requirements and performance requirements,
3. Critical technologies, personnel, and processes have been identified and assessed,
4. The technical and programmatic risks are identified and the mitigation plans are acceptable,
5. Identify the Technical Performance Measures (TPM) and the tracking plan,
6. Establish government data rights and access to software documents,
7. Present a software development plan, identifying the development of new software and the integration of existing software,
8. Identify existing software documentation, and new software documentation to be developed,
9. Installation plan concept,
10. Contractor Integrated Test Plan.

C.3.3.3.2 Preliminary Design Review (PDR) - Phase I. The Contractor shall conduct a Preliminary Design Review (PDR). The Contractor will propose the date for PDR no later than 30 days after contract award, to take place not later than 180 days after contract award. The purpose of the PDR is to confirm the approach for System Detail Design (as an integrated composite of personnel, product, and process solutions) satisfies the functional baseline; risks are mitigated with closure plans for remaining risks demonstrating the required process; and the total system is ready for detailed design. The PDR will address and confirm that:

1. The process completely defines the system requirements for detailed design including that:
  - a. The design approach is balanced across cost, schedule, performance and risk for the lifecycle,
  - b. The systems physical architecture is an integrated design which satisfies the requirements including interoperability and interfaces,
  - c. An audit trail from the SFR is established with changes substantiated,
  - d. The systems design approach is consistent with test and evaluation results,
  - e. Risks are mitigated and remaining risks defined,
  - f. The allocated baselines for subsystems are defined.
2. The requirements allocation, design synthesis, and functional flow are identified and trackable.
3. Configuration Items and Item Specifications are defined, final and traceable to the system specification.
4. Sufficient design and internal test has been accomplished to verify the completeness and achievability of the defined requirements.
5. The Producibility and manufacturing aspects of the system are being addressed during the design phase. The Contractor shall demonstrate that:
  - a. Manufacturing engineering considerations are integral to the design process,
  - b. The proposed designs will be evaluated in make versus buy,
  - c. The program delivery schedules will be met,
  - d. Manufacturing planning is considered throughout the design phase.
6. Logistics development maintenance concept, lifecycle cost analysis, support equipment.
7. Software issues:
  - a. Overall software structure to the Computer Software Component (CSC) level,
  - b. Functional flow showing how the System Requirements Specification (SRS) elements are allocated,
  - c. Control function descriptions that explain how the execution control of the CSCs will be accomplished,
  - d. Plans for testing the software.
8. Quality Assurance test, inspection and acceptance criteria.
9. Reliability, Availability, Maintainability.
10. Human Factors.
11. System Safety.
12. Adequate Staffing.

C.3.3.3.3 Critical Design Review (CDR) - Phase I (see Section F for Schedules). The Contractor shall conduct a Critical Design Review (CDR). The Contractor shall notify the Government 15 days prior to the proposed date. The proposed CDR date must be within 200 days after contract award. The purpose of the CDR is to demonstrate the system detailed design (as an integrated composite of people, product, and process solutions) is complete, meets requirements, and that the system is ready for fabrication and coding. At a minimum, the following

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items shall be completed before the CDR:

- a. ATWS Systems Requirements Analysis.
- b. ATWS Subsystems Requirements Analysis.
- c. PDR.
- d. System Detail Design.
- e. LORA.
- f. RCM.
- g. ATWS Environmental Assessment Report.
- h. ATWS Health Hazard Assessment Report.

The CDR will address and confirm that:

1. Issues for the system, functional areas, and subsystems are resolved,
2. The process completely defines system requirements including that:
  - a. The system is balanced across cost, schedule, performance and risk for the lifecycle,
  - b. The system physical architecture is an integrated detailed design including interoperability and interfaces,
  - c. An audit trail is presented with traces and substantiates any changes from the PDR,
  - d. The allocated baseline is finalized,
  - e. Adequate Contractor tests have been completed to verify system requirements have been, or will be met.
  - f. The maintenance and sustainment design influences, to reflect the Condition Base Maintenance strategy, have been identified.
3. The system design compatibility with external interfaces has been established.
4. Software issues:
  - a. Description of the detailed design of the software, including data definitions, control flow, timing, sizing, and storage allocation,
  - b. Detailed characteristics of all interfaces. Lifecycle support considerations that include a description of the software tools and facilities used during development that will be required for software maintenance.
5. The producibility and manufacturing aspects of the system that were addressed during the design phase. The Contractor shall demonstrate that:
  - a. Manufacturing engineering considerations were integral to the design process,
  - b. The proposed designs were subject to make versus buy analyses,
  - c. The program delivery schedules will be met,
  - d. Make items have preliminary manufacturing routings, methods and inspection criteria established.
  - e. Purchased items with long lead times are on order or will be in support of program delivery schedules.
  - f. Ease of installation was considered during the design process and has been designed into the system.
6. Quality Assurance.
7. Reliability, Availability and Maintainability.
8. Human Factors.
9. System Safety.
10. Design Producibility within production budget.

C.3.3.3.4 System Verification Review - Phase I. The Contractor shall participate in the System Verification Review (SVR) and have all reviews and reports available for the Government to review. The SVR is a multi-disciplined technical review to ensure that the ATMP can proceed into Full-Rate Production within cost, schedule, risk, and other system constraints.

C.3.3.3.5 Production Readiness Review (PRR) - Phase I. The Production Readiness Review (PRR) shall be performed to formally evaluate the Contractor's production readiness, identify existing or projected manufacturing problems, and areas of risk. The PRR shall occur no later than 30 days after commencement of OT. The Contractor shall demonstrate progress in the following areas:

1. Attaining the program's production goals,
2. Resolving manufacturing problems (or that a plan for their resolution acceptable to the Government has been developed),
3. Mitigating all production risks.

The Contractor shall show that the system design has included those key production factors (e.g., least cost, minimum time, manufacturing simplicity, flexibility, resource availability) necessary to assure the system can be acquired on schedule at minimum cost. The initial production readiness review shall be conducted at the Contractor's facility. At the Government's discretion, follow-on production program reviews may be held quarterly at the Contractor's facility. The review dates shall be Contractor-proposed, Government-approved, and incorporated into the program schedule. The agenda of the PRR shall include, as applicable:

1. A Manufacturing Program Review to include the overall manufacturing system and detailed factors such as: manufacturing organization, responsibilities, facilities and equipment, manufacturing methods, and production flow.
2. A status review of all production efforts for cost and schedule considerations.
3. A status review of manufacturing technology and other previously recommended actions to reduce cost, manufacturing risk, and industrial base concerns.

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4. The identity of open production concerns which require additional direction or effort to minimize risk to the production program.
5. A status review of production engineering efforts, tooling and test equipment demonstrations, and proofing of new materials, processes, methods, special tooling, test equipment.
6. A status of the hazard list from Environment, Safety and Occupational Health (ESOH) analysis.
7. The status of long lead items for production, if any.

C.3.4 SYSTEMS ENGINEERING - PHASE I & II. The Contractor shall establish and maintain an effective systems engineering program throughout the design, testing and production processes. The System Engineering Management Plan (SEMP) shall describe the Contractors planned systems engineering approach to meeting the programs contract, objectives, and overall technical and management approach and shall be consistent with the content of the government System Engineering Plan. The SEMP shall be reviewed at the Start of Work Meeting and made available upon request by the Government. The SEMP shall address the following sub-sections:

C.3.4.1 Open Systems Design - Phase I. The Contractor shall use an open systems approach as the preferred design strategy to: (1) choose commercially supported specifications and standards for selected system interfaces (external, internal, functional and physical), products, practices, and tools; and (2) build open system architectures as the primary foundation in developing the proposed system and its elements. Open systems is a system design philosophy that uses widely-accepted, industry-approved interface standards that will allow technological upgrades in system components to be easily inserted in the future. The Contractor shall identify the means for ensuring conformance to open systems standards and profiles throughout the development process and provide evidence that the process being used to manage the open systems approach support open system benefits such as portability, interoperability, technology insertion, vendor independence, reusability, scalability, and commercial product based maintainability.

C.3.4.2 Requirements Traceability Matrix (RTM) - Phase I. The Contractor shall develop and maintain a Requirements Traceability Matrix (RTM) that uniquely identifies program requirements to ensure that the requirements can be traced and verified through the design, build, test, and verification phases of development. RTM shall be delivered IAW CDRL A013 - Technical Report / Study Services (RTM).

C.3.4.3 Corrosion Prevention and Control - Phase I & II. The Contractor shall develop a Corrosion Prevention and Control Plan (CPCP) that describes the specific measures to be implemented and presented at PDR for Government review. Updates to the CPCP shall be completed, as changes are made, and presented to the Government for review at CDR. The purpose of the CPCP is to document corrosion-related design decision and identify materials and corrosion control methods used to manufacture the ATWS. The plan shall address the techniques and processes to be applied in assuring that the products to be delivered will meet the requirements contained in the ATWS performance specification. Changes in materials, coatings, or corrosion prevention methods during the course of production shall be reflected in updated versions of the CPCP. The CPCP shall provide the following information:

1. A discussion of corrosion prevention techniques employed in design, including measures taken to minimize water collection and entrapment and collection of debris, mitigate corrosion in areas inaccessible to cleaning and maintenance, and prevent dissimilar metal contact.
2. Process instructions detailing application of coatings and other corrosion prevention compounds (if any). Process instructions should address personnel training and qualification, material inspection, surface preparation, and coating or compound application procedures.
3. Any test data developed by the ATWS manufacturer for coatings and materials.
4. Identification of coating and substrate combinations for which no testing was required or performed.
5. Recommended corrosion control-specific maintenance.
6. Quality assurance program provisions to address materiel control to ensure that the materials used in construction of the ATWS are as shown on engineering drawings; and in-process measurements (number, type, frequency, locations) to ensure compliance with process instructions developed under 2, above.

Changes in materials, coatings, or corrosion prevention methods during the course of production shall be reflected in updated versions of the CPCP.

C.3.4.4 Reliability, Availability, and Maintainability (RAM) - Phase I & II.

C.3.4.4.1 Reliability and Maintainability Program. The Contractor shall maintain a comprehensive Reliability and Maintainability (R&M) program to ensure the ATWS meets the R&M standards set forth in the performance specification. The design shall be monitored throughout the entire period of performance to identify and assess any changes which would impact reliability or maintainability. The Contractor shall develop reliability analysis and predictions as necessary to ensure compliance with the performance specification. The program shall encompass all aspects of reliability with respect to design selection of components, predictions, and testing. If it is determined that an item is a consumable an analysis shall be performed at the next higher indenture level. The Contractor shall maintain and make available to the Government all R&M data on any vendor or subcontractor supplied item and shall inform the Government of any part or component which will degrade system R&M requirements. The R&M program shall include the following tasks:

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C.3.4.4.1.2 Reliability and Maintainability Program Plan. The Contractor shall submit a reliability plan with system and component level reliability, availability, and maintainability predictions. The reliability plan shall address reliability growth. The Reliability Plan shall be prepared IAW CDRL A014 Reliability and Maintainability Program Plan.

C.3.4.4.1.3 Reliability Guidance. The Contractor shall use sound reliability engineering principles as presented in MIL-HDBK-217, MIL-HDBK-189, MIL-HDBK-781, and MIL-HDBK-338. RAM discussions and tradeoffs shall be documented and presented at all design reviews.

C.3.4.4.1.4 Reliability Reporting. Reliability predictions shall be provided and presented at all Design Reviews by the Contractor for the ATWS. Reliability prediction requirements shall be satisfied using existing field analytical or test data where possible. If insufficient reliability data exists, development equipment is selected, or modification to Commercial Off The Shelf (COTS) or a Non-Developmental Item. equipment will affect greater than 30% of the predicted failure rate items, then the Contractor shall perform a new Reliability Prediction based on parts stress analysis.

If not specified in the equipment specification, reliability predictions shall be performed. MIL-HDBK-217, Notice 2 or commercial equivalent shall be used for the predictions. To support the prediction process, existing predictions or field data (preferred, if available) may be used provided that all assumptions employed are consistent. Pertinent information from other analyses shall be used as applicable. Justification of failure rates, other than those listed in MIL-HDBK-217, must be identified in the predictions. Failure rate justifications shall be based upon:

1. Similarity of individual part types (i.e. Logic, family construction, processes),
2. Screening requirements of database (i.e. less than or equal to proposed equipment),
3. Vintage of database (i.e. data no more than five (5) years old depending on part type),
4. Similarity of equipment usage environment.

C.3.4.4.1.4.1 Failure Modes and Effects Analysis (FMEA). The Contractor shall prepare a detailed FMEA for its ATWS to address all the failure modes in detail for all the critical components on the ATWS in accordance with MIL-STD01629A and provide the results with CDRL A087. The Contractor shall maintain a current FMEA report, updating it to incorporate all data from testing and analysis activities.

C.3.4.4.1.5 Procedures and Controls. The Contractor shall maintain procedures and controls which ensure products obtained from suppliers, vendors and subcontractors meet reliability requirements.

C.3.4.4.1.6 Reliability Predictions. The Contractor shall provide reliability predictions based on a defined configuration baseline IAW CDRL A015 Reliability Prediction and Documentation of Supporting Data. Reliability data shall be predicted and/or adjusted to apply a Ground Mobile environment and shall account for end-user environmental conditions, including the affects of sun load conditions. System environmental parameters presented in the Performance Specification shall apply. De-rating criteria applied to calculations shall be detailed within the reliability report. Where equipment reliability history data exists, this data shall take precedence over predicted data and be adjusted accordingly to thermal and environmental characteristics. The predictions shall be provided to the lowest indenture level and updated each time design or mission profile changes significantly impact the ATWS. In the event where the system architecture provides redundant functional or physical capabilities, the reliability report shall separately summarize adjustments to the predictions and identify the Mission Reliability. The Contractor shall prepare and deliver a top-down indentured reliability report to include the identification of the Mean Time Between Mission Failure (MTBOMF) for each maintenance-worthy item in addition to identification of the system MTBOMF using best commercial practices. Application of MIL-HDBK-217 as guidance is encouraged.

C.3.4.4.1.7 Failure Reporting, Analysis and Corrective Action System. The Contractor shall develop a closed loop failure reporting system, with procedures for analysis of failures to determine the root cause, and documentation for recording corrective actions taken. The Failure Reporting, Analysis, and Corrective Action System (FRACAS) shall include uniform failure reporting, failure analysis reports and corrective actions. All hardware and software failures from system level down to the subassembly level shall be subject to these requirements throughout the testing period including production and integration testing, and during the post-production support period (to include warranty, depot and Contractor Logistics Support (CLS) period, as applicable). In the event where a failed item is returned subject to a Product Quality Deficiency Report (PQDR), traceability of the PQDR shall be integrated into the FRACAS. The Contractor shall execute a single FRACAS database to encompass in-factory (testing) and in-field (post-production) failure reporting and shall be transferred to the Government upon conclusion of the period of performance. The Contractor shall notify the Government of any failure impacting cost, schedule, producibility, supportability, and cost of ownership or interface and performance. All failures, critical and non-critical, shall be reported quarterly to the Government for review IAW CDRL A016 - Failure Summary and Analysis Report. All failures shall be categorized as in-field or in-factory failures. System operational hours (Elapsed Time Meter readings) shall be identified for each failure occurrence and included in the FRACAS data structure. The Contractor shall assess the failure data for the identification of trends (5 or more failures of the same root cause) and identify those trends in the monthly report. Each FRACAS report shall identify the root cause, and detail the remedial action taken including parts replaced. The Government reserves the right to conduct a Failure Review Board (FRB) throughout the contracted period of performance. The Contractor is encouraged to use MIL-HDBK-470 (Designing and Developing Maintainable products and Systems) as guidance.

C.3.4.4.1.8 Testability. The Contractor shall develop and implement a Testability Program to ensure the ATWS is designed to provide the end-user and technicians assurance of system operation and ease in fault isolation. The Testability Program may be included with the Reliability and Maintainability Program.

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C.3.4.5 Electromagnetic Interference Test Procedure. Prior to commencement of Electromagnetic Interference (EMI) testing IAW CDRL A045 Design Verification Test Plan (reference C.3.8.2), the Contractor shall develop EMI test procedures that comply with the test procedures of MIL-STD-461 (Requirements for the Control of Electromagnetic Interference Characteristics of Subsystem and Equipment) to verify compliance with the EMI requirements of the integrated ATWS.

C.3.4.5.1 Electromagnetic Interference Test Report. The Contractor shall prepare an Electromagnetic Interference (EMI) Test Report IAW A047 Design Verification Test Report (reference C.3.8.5) documenting the compliance of ATWS EMI requirements of the contract specification. The Contractor shall also discuss in the test report the resolution(s) and EMI fix(s) for all of the EMI performance requirements for which the integrated ATWS was not in compliance. Additional testing and analysis of the resolution(s) and EMI Fix(s) shall be conducted to verify that the proposed resolution(s) is/are compliant to the EMI requirements.

C.3.4.6 Quality Assurance Program. The Quality Assurance Program requirements are described in section E.

C.3.4.7 Human Systems Integration (HSI) / Manpower & Personnel Integration (Manprint).

C.3.4.7.1 Human Systems Integration. The Contractor shall address the human systems elements and follow MIL-STD-1472 and MIL-HDBK-759 to the maximum extent practicable during design and development of all the ATWS system and sub-system configuration and integration.

C.3.4.7.2 Human Factors Analysis. The Contractor shall conduct a Human Factors Analysis of the deliverable ATWS and submit a technical report of the crew and maintainers functionality and task loading. The analysis shall include evaluations of the crew and maintainers; space claim, head clearance, ingress and egress, task loading, operation and maintenance of all controls and displays, the operation of the integrated ATWS system, and the operations of all hatches and systems affected by the ATWS integration. Delivery of the Human Factors Analysis and format shall be IAW CDRL A019 Scientific and Technical Reports (HFA).

C.3.4.7.3 Human Engineering Test Plan. The Contractor shall document proposed testing to demonstrate that the personnel-equipment and software combination can accomplish the intended operations and Condition Based Maintenance Plus (CBM+) and shall be delivered IAW CDRL A020 Human Engineering Test Plan. This plan serves as a means of planning for validating human performance requirements, accuracy of personnel selection, adequacy of training and acceptability of design of the personnel-equipment and software interface.

C.3.4.7.4 Human Engineering Test Report. The Contractor shall conduct testing under realistic conditions with representative operators to verify that the system will meet requirements IAW CDRL A021 Human Engineering Test Report. Testing shall be conducted to verify operator and maintainers tasks can be reliably completed within constraints to meet mission requirements and maintenance over the systems lifecycle. The Contractor shall provide evidence that the human-system interface requirements for the habitability, operation, maintenance, training and support of the system have been met. The Contractor shall describe the principal means of assessing the compatibility of the human performance requirements, personnel selection criteria, training program, and design of the equipment and software interfaces. The Contractor shall provide sufficient information to determine whether and to what level or standard(s) each trained individual can perform in the specified sequence all assigned systems tasks, to determine whether and to what extent each individual's performance is affected by equipment configuration, the performance of other system personnel, or both; and to assess the impact of the measured human performance on the attainment of task, task group, and mission requirements.

C.3.4.7.5 Critical Task Analysis Report. The Contractor shall conduct a critical task analysis. The analysis shall identify and document critical tasks for operators, maintainers, and support personnel. The Contractor shall provide the results of the analysis IAW CDRL A022 - Critical Task Analysis Report. Tasks with a direct impact on or correlation to total system performance must be identified. Frequently completed or performed tasks and those with a large manpower component shall also be included. The report shall identify who is to perform the operator and maintenance related tasks. The report will identify whether the creation of Source, Maintenance, and Recoverability (SMR) codes are needed or if they can be derived from existing SMR codes. The Analysis results should be coordinated with training material, approaches, and methods.

C.3.4.8 Producibility. The Contractor shall apply effective producibility principles during the ATWS design and integration process to ensure that the production units will be easy to manufacture using the anticipated production facilities, equipment, materials, manpower, and processes. The producibility planning effort shall also maximize the ease of production control, quality control, tooling and inspection. The Contractor shall report on the progress of this effort during the PDR, CDR, and PRR and make any data created available to the Government upon request.

### C.3.5 ENVIRONMENT, SAFETY AND OCCUPATIONAL HEALTH.

C.3.5.1 System Safety Program Plan (SSPP). The Contractor shall create and maintain a Systems Safety Program Plan (SSPP) IAW CDRL A023 System Safety Program Plan and the System Safety Program Guidance, Attachment 0018. The Contractor shall identify and evaluate environmental, safety, and health hazards, define risk levels, and establish a program that manages the probability and severity of all hazards associated with development, use, and disposal of the system in accordance with MIL-STD-882. All risks will be evaluated by the Government in accordance with MIL-STD-882 and accepted as appropriate prior to exposing people, equipment, or the environment to known system related Environment, Safety, and Occupational Health (ESOH) risks. As part of the SSPP the Contractor shall provide the Government with an assessment of applicable Environment, Safety and Occupational Health (ESOH) laws and regulations, identifying all non-compliances. The Contractor must identify all explosive safety risks as such in the system safety documentation.

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C.3.5.2 General Requirements. The Contractor shall comply with the Occupational Safety and Health Administration (OSHA) regulation and applicable state and local regulation. The Contractor shall identify the general procedures for disposition and disposal of hazardous waste generated for this effort. The Contractor shall comply with the applicable federal, state and local statutes and regulation relating to protection of the environment and public safety and health. Environmentally preferable, recycled, or recovered materials shall be used to the maximum extent possible in the procurement or manufacture of unique parts provided that the material meets or exceeds the operational and maintenance requirements of the ATWS and the FOLAV.

C.3.5.3 Safety Assessment Report Phase I & II. The Contractor shall prepare a Safety Assessment Report (SAR) that identifies all potential and actual safety and health hazards associated with the integrated ATWS. The SAR shall include a description and evaluation of each hazard and the actions identified for mitigation of the associated risks. Hazard risks shall be evaluated by severity and probability of occurrence before and after mitigation in accordance with MIL-STD-882 and the System Safety Program Guidance (Attachment 0018). The SAR shall be submitted in Contractor format IAW CDRL A024 Safety Assessment Report (SAR). The SAR shall:

1. Briefly describe the ATWS and its components including software as well as other impacted vehicle changes with the ATWS integrated into the LAV-ATA2.
2. Provide general physical characteristics of the system and components and describe how the software works in the system. Use photos, diagrams, sketches or drawings as necessary.
3. Identify all safety features of the hardware, software, system design and inherent hazards.
4. Establish special procedures and/or precautions to be observed by Government test agencies and system operators and maintainers to ensure the safety of personnel and property.
5. Summarize the safety criteria and methods used to classify and rank hazards.
6. Summarize results of tests and analyses used to identify hazards. Include results of tests conducted to validate safety criteria or requirements.
7. Identify hazards that still pose a risk to users, and actions that have been taken to reduce this risk.
8. Categorize hazards as to whether they may be expected to occur under normal or abnormal use.
9. Annotate any hazardous material generated or used in the system. Provide the appropriate procedures and precautions for packaging, handling, storage, use, transportation and disposal of the material. Include explosive hazard classifications.
10. Include applicable Material Safety Data Sheets as attachments.
11. Identify all reference or source documents used to prepare the report.
12. A signed statement from the Contractor indicating that identified hazards have been controlled or eliminated and the system is ready for operation and test.

C.3.5.4 Safety Assessment Report (SAR) Update Phase I and Phase II. In the event the vehicle system is modified or procedural changes are made during Phase I and Phase II, the Contractor shall update the SAR to reflect those modifications or changes. The Contractor shall submit an updated SAR IAW CDRL A024 Safety Assessment Report (reference C.3.5.3).

C.3.5.5 System Safety Hazard Analysis Report. The Contractor shall perform and document a Subsystem Hazard Analysis (SSHA) to identify hazards and assess the risks associated with the components or subsystems and the interfaces between components of subsystems. The SSHA shall be in Contractor format and suitable for developing the System Hazard Analysis (SHA). The Contractor shall perform and document a System Hazard Analysis (SHA) to identify hazards and assess the risks of the total system design, including software, batteries, and subsystem interfaces, and the ATWS as integrated. The SHA shall verify system compliance with safety requirements contained in system specifications; identify previously unidentified hazards associated with the subsystem interfaces and system functional faults; and recommend actions necessary to eliminate identified hazards and/or control their associated risk to acceptable levels. The SHA shall include any selected hazards, hazardous areas, or other specific items to be examined or excluded. The Contractor shall provide a System Safety Hazard Analysis Report IAW CDRL A025 System Safety Hazard Analysis Report to the Government and identify any residual hazards that require Government acceptance.

C.3.5.6 Operating and Support Hazard Analysis Report. The Contractor shall perform and document an Operating and Support Hazard Analysis (O&SHA) to evaluate activities for hazards or risks introduced into the system by operational and support procedures and to evaluate adequacy of operational and support procedures used to eliminate, control or abate identified hazards or risks. The O&SHA shall document system safety assessment of procedures involved in system production, deployment, installation, assembly, test, operation, maintenance, servicing, transportation, storage, modification, demilitarization, and disposal. The O&SHA shall include the minimum hazard probability and severity, following the procedures in MIL-STD-882 for reporting thresholds and the specific procedures to be evaluated. The Contractor shall provide an Operating and Support Hazard Analysis (O&SHA) report to the Government IAW CDRL A026 Technical Report Study / Services.

C.3.5.7 Health Hazard Assessment. The Contractor shall perform and document a Health Hazard Assessment to identify health and environmental hazards and to recommend engineering controls, equipment, and/or protective procedures, to reduce the associated risk to an acceptable level. A health hazard is defined as an existing or likely condition, inherent to the operation, maintenance, transport, storage or use of material or equipment, that can cause death, injury, acute or chronic illness, disability, or reduced job performance of personnel. As part of this effort, the Contractor shall:

1. Perform analyses to determine if materials cause adverse effects in living creatures.
2. Determine if materials pose a present or future threat to the environment.

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3. Identify if materials cause damage to equipment or property during the life cycle of the system.
4. Evaluate and recommend alternative materials that reduce risk levels. Cost considerations shall be part of the evaluation.
5. Determine if hazardous wastes are generated and identify controls.

C.3.5.7.1 Health Hazard Considerations. Items to be assessed during the Health Hazard Assessment referenced in C.3.5.7 include:

1. Automotive issues (e.g., stability, braking, handling).
2. Fire protection issues (e.g., AFSS concentration and coverage).
3. Toxic fumes (e.g., engine exhaust, weapons firing).
4. Noise levels (e.g., steady-state, drive-by, impulse).
5. Whole body vibration (e.g., Occupants exposure during vehicle movement).
6. Musculoskeletal Trauma (Lift and carry of heavy objects).
7. Weapons characteristics (e.g., blast overexposure, misfire, procedures, cook off, safety mechanisms, and weapon/vehicle integration).
8. Ammunition storage.
9. Operators devices/procedures to ensure safe operation.
10. Analyses and tests conducted with quantities involved to demonstrate safety.
11. Sharp edges or pinch hazards that may come into play when operating or servicing the vehicle.

C.3.5.7.2 Health Hazard Assessment Report / Updates (HHAR) (Phase I and Phase II). The HHAR shall be submitted in Contractor format IAW CDRL A027 Health Hazard Assessment Report. The data for this report shall be collected from the ATWS upgraded vehicle the Contractor submits for Government testing. HHAR updates shall be submitted in Contractor format IAW CDRL A027 Health Hazard Assessment Report as configuration changes occur. The Contractor in its report shall:

1. Identify, describe and discuss each potential or actual health hazard issue. Include whether the hazard may be expected to occur under normal or unusual operating, maintenance or storage conditions.
2. Recommend actions to eliminate, reduce or control each actual or potential health hazard described.
3. Identify hazardous materials by chemical name, common or trade name, NSN (if applicable), physical form and manufacturer or supplier.
4. Annotate where in the system or equipment hazardous materials are used.
5. Identify the conditions under which hazardous materials pose a health threat.
6. Recommend disposal actions for each identified hazardous material.
7. List all source materials and references used for preparing the report.

C.3.5.7.3 Hazard Log. The Contractor shall document and track all hazards from identification until the hazard is eliminated or the associated risk is reduced to a level acceptable to the Government. A central file or document called a Hazard Log (HL) shall be maintained for the life of the contract and shall include all hazards identified through testing and other analyses IAW Severity Categories and Probability Levels provided in System Safety Program Guidance (Attachment 0017). The Hazard Log shall be presented at each In-Process Design Review (reference C.3.3.2.7). During the first review, the Contractor shall present the complete Hazard Log. At subsequent reviews, the Contractor need only report on changes, updates, or closeout actions since the previous review. The Hazard Log shall contain:

1. A description of each hazard, to include cause, possible effect, and hazard category,
2. Status of each hazard,
3. Traceability of the resolution action on each hazard, from the time the hazard was identified to the time the risk associated with the hazard was reduced to a level acceptable to the Government,
4. All hazards identified through testing and other analyses.

C.3.5.8 System Safety Working Group (SSWG) - Phase I and Phase II. The SSWG is a chartered advisory group dedicated to addressing safety issues and supporting the Government's System Safety Manager. The primary function of the SSWG is to ensure all safety issues and identified hazards are adequately addressed, to ensure the safe, manned operation of the ATWS upgraded LAV vehicles during Government testing and fielding of the weapon system. The Contractor, major Subcontractors as defined by Section L.6.4.1.1.2, and the Government are active, participating members. At least one Contractor representative shall attend each SSWG. The Government will chair the meetings. The meetings shall be held at mutually agreed upon times and places. The SSWG may address any issues related to environmental, system safety, and occupational health. Contractor tasks at an SSWG meeting include:

1. Reviewing safety program status.
2. Summarizing hazard analysis.
3. Presenting incident assessments for system mishaps or malfunctions.
4. Presenting status of assigned actions.
5. Identifying safety deficiencies.

C.3.5.9 Hazardous Materials Management Program and Pollution Prevention. The Contractor shall implement a Hazardous Materials

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Management Program (HMMP) and Pollution Prevention (P2) in accordance with NAS 411. The Contractor shall avoid the use of toxic chemicals, hazardous materials, and ozone depleting substances (ODS) in the design, operational support and disposal of the ATWS where possible. The HMMP shall establish a process to manage all requirements for asbestos, radioactive materials, cadmium, hexavalent chromium, and extremely toxic or hazardous materials in design, in all phases of the life cycle. In some cases, the only acceptable management process may be total elimination of the requirement. The use of Class I or Class II Ozone Depleting Chemicals (ODCs) is prohibited in the design or operational support of the system without specific written approval of the contracting officer. More information on chemicals and hazardous materials to be avoided can be obtained from the Environmental Protection Agency (EPA).

C.3.5.9.1 Hazardous Materials Management Program and Pollution Prevention Plan. The Contractor shall provide a Hazardous Materials Management Program (HMMP) and Pollution Prevention (P2) Plan to be reviewed by the Government at the Start of Work Meeting. The HMMP&P2 Plan shall define the Contractor's approach to assure that consideration is given throughout all acquisition phases of the system; hazardous materials and processes associated with each contract hardware deliverable item are selectively identified and evaluated based on environmental and health concerns; and hazardous material elimination, minimization, or control are considered and detailed in the system design and the manufacturing process.

C.3.5.9.2 Hazardous Materials Management Program and Pollution Prevention Plan Report. The Contractor shall provide a Hazardous Materials Management Program (HMMP) and Pollution Prevention (P2) Plan Report IAW CDRL A028 Hazardous Material Management Program and Pollution Prevention Plan Report to the Government for review and approval. The HMMP&P2 Plan shall define the Contractor's approach to assure that consideration is given throughout all acquisition phases of the system; hazardous materials and processes associated with each contract hardware deliverable item are selectively identified and evaluated based on environmental and health concerns; and hazardous material elimination, minimization, or control are considered and detailed in the system design and the manufacturing process.

C.3.5.10 Environmental Assessment - Phase I. The Contractor shall provide information to support the Government generation of National Environmental Policy Act (NEPA) decision (in the preparation of formal NEPA documents, which include Categorical Exclusion (CATEX), Record of Environmental Consideration (REC), EA, or Environmental Impact Statement (EIS)). The information provided by the Contractor will be used to assess the potential environmental impacts of developing, integrating and testing of the ATWS. The results shall be submitted in Contractor format IAW CDRL A029 Technical Report Study/Services. The assessment shall contain an analysis of the possible impacts that the upgrades may have on the environment (personnel, wildlife, atmosphere, water, vegetation, and soil) while it is being operated, transported, or stored. The Contractor shall include in the assessment all hazardous and toxic wastes generated.

C.3.5.11 Environmental Assessment Updates Phase II. In order to support US Government Phase II, the Contractor shall supply updates to the information required in Phase I (reference C.3.5.10), concentrating on Government testing, production, production verification testing, fielding support, and disposal. Updates shall be submitted IAW CDRL A029 Technical Report Study/Services as change pages to the original submittal.

**C.3.6 CONFIGURATION MANAGEMENT (CM)**

C.3.6.1 Configuration Management Program. The Contractor shall establish a CM program defining the management system for configuration identification, configuration control, accountability for configuration changes and configuration audits. The Contractor's CM program shall be defined in a configuration management plan. The Configuration Management Plan shall be provided and approved IAW CDRL A030 Configuration Management Plan (CMP). The principles contained in EIA-649 and MIL-HDBK-61 may be used for guidance. The CM program shall include the process for the control of all hardware and software configuration documentation, media and parts representing or comprising the ATWS. The Contractor's CM program shall consist of configuration identification, configuration control, configuration status accounting, and configuration audits. The Contractor shall designate a CM representative to serve as a primary point of contact to the Government for all CM matters. The Contractor's representative shall be responsible for any subcontractor's CM efforts. The Contractor shall notify the Government of any changes at the Contractor's facility, which affect the Contractor's established CM program.

C.3.6.1.2 Baseline Management. The Contractor shall be responsible for maintaining the currency and accuracy of the established baseline to ensure form, fit, function and interface of the ATWS. The Contractor shall establish definitive processes, which identify how the baseline will be managed and maintained. These processes shall be defined in the Contractor's configuration management plan and made available for Government review.

C.3.6.1.3 Engineering Release System. The Contractor shall maintain an engineering release system and shall use the system to issue configuration documentation to functional activities (e.g. manufacturing, logistics, quality control, and engineering) and to authorize the use of configuration documentation associated with an approved configuration. The Contractor shall maintain current and historical engineering release information for all configuration documentation for the ATWS. The Contractor shall submit an Engineering Release Record (ERR) IAW CDRL A031 - Engineering Release Record (ERR) to release new or revised configuration documentation to the Government for approval. The Contractor shall ensure all Government approved ERR information and documentation is reflected in the Configuration Status Accounting (CSA) database.

C.3.6.1.4 Configuration Identification Phase I & II. The Contractor shall participate in a joint Government and Contractor team to designate configuration items (CIs) to be managed by the Government and those to be managed by the Contractor at a lower level or tier. If there is a question, disagreement or dispute as to which Configuration Items are to be managed by the Contractor, the Government shall have the authority to decide which items are to be managed by the Contractor. The Government will retain configuration management of the LAV-ATA2 automotive hull. For those CIs that have been identified for Government control, the Contractor shall provide form, fit,

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function, and interface documentation necessary for configuration status accounting. The government shall approve the list of Contractor CIs IAW CDRL A032 Configuration Identification List. The Contractor shall establish management practices for lower level or tier CIs including the MITAS. The Contractor shall establish a database that records and maintains configuration baselines. The CI data shall identify the current approved baseline by:

1. Document number and Document type.
2. CAGE code.
3. Revision Level.
4. Nomenclature.
5. Drawing size.
6. Indentured breakdown of parts, which display a parent to child relationship, to include quantity. The breakdown shall only pertain to CI documents under Government configuration control.

C.3.6.1.5 Allocated Baseline. The Contractor shall be responsible to develop and present for government approval the Allocated Baseline(ABL). The ABL will be presented at the Preliminary Design Review [PDR] IAW CDRL A033 Baseline Description. The ABL shall include specifications and drawings, as necessary to specify: (1) the essential CI functional characteristics; (2) external and internal interface requirements for each CI; (3) physical characteristics necessary to ensure compatibility with associated systems and CI's; (4) constraints on the design of a CI, including the GFE LAV-ATA2 automotive hull and MITAS employed, envelope dimensions, component standardization and ILS requirements; and (5) integration components required to integrate the ATWS into the LAV-ATA2 automotive hull. The output of the PDR will be an approved ABL demonstrating that the system requirements presented in the ATWS Performance Specification have been allocated to hardware, software and human subsystems.

C.3.6.1.6 Initial Product Baseline. The Contractor shall establish the initial product baseline and present for review and approval by the government NLT the Critical Design Review [CDR]. The Initial Product baseline establishes the detailed design documentation (Item Detail Specifications) IAW CDRL A033 Baseline Description for each CI, including any software changes and upgrades. Upon government approval of the Initial Product Baseline, changes to the IPBL will require government approval under the formal guidelines found in Paragraph 3.6.2.1 of this document.

C.3.6.1.7 Final Product Baseline. The Contractor shall establish the Final Product Baseline IAW CDRL A033 Baseline Description by the successful completion and Government acceptance of the Physical Configuration Audit (PCA), which describes all the necessary functional and physical characteristics of the ATWS to include all verifications required to demonstrate that the ATWS meets all required performance specifications. The PCA shall be conducted at the Contractor's or subcontractor's site on a Government selected candidates of the finalized ATWS after completion of IOT&E. The Contractor shall make changes to the product baseline only through the Engineering Change Proposal (ECP) process detailed in Paragraph 3.6.2.1.

C.3.6.2 Configuration Control. The Contractor shall implement configuration control methods and procedures, which maintain the integrity and traceability of an established baseline. Changes to established baselines, subsequent to the Initial Product Baseline, shall only be made after Government approval of Engineering Change Proposals (ECP) IAW CDRL A034 Engineering Change Proposals (ECP) and Request for Deviation (RFD) IAW CDRL A035 Request for Deviation (RFD). Sufficient supporting data to evaluate the proposed change, such as drawings, supplemental drawings, sketches, specifications, or manufacturer's data sheets, shall be submitted with ECP's and RFD's. Changes shall be identified to the affected assembly serial number, or if not part of an assembly, to the affected equipment serial number. The Contractor's configuration control process shall be available for Government review. Upon establishment of the initial product baseline, the Contractor shall document all changes to the CI through Engineering Change Proposals (ECP) or Request for Deviation (RFD) via the MEARS described in Attachment 0005, or any other comparable mode of tracking that the Government can obtain access to. Electronic delivery of ECPs and RFD requires a minimum completion of mandatory fields on electronic form.

C.3.6.2.1 Engineering Changes Phases I and II. Upon approval of the Initial Product Baseline, the Contractor shall document and track engineering changes and deviations using formal Engineering Change Requests that will be evaluated by the PM LAV Change Control Board (CCB) for acceptance or instruction for further action. Engineering Change Proposals (ECP) shall be submitted by the Contractor, and shall be limited to those, which are necessary or offer significant benefit to the Government. MIL-HDBK-61 provides guidance concerning the classification of ECPs.

The Contractor shall provide Class I ECPs for formal Government approval by PM LAV and Class II ECPs for information. Class I ECPs are defined as those affecting form, fit, or function of the CIs and CSCIs jointly agreed upon according to Paragraph 3.9.3 Configuration Identification. Class I ECPs will be submitted to the government under the guidelines presented IAW CDRL A034 Engineering Change Proposals (ECP) (reference C.3.6.2.1).

Class I ECPs shall be submitted when changes are required to:

1. Correct deficiencies.
2. Add or modify interface or interoperability requirements.
3. Make a significant and measurable effectiveness change in the operational capabilities or logistics supportability of the system.
4. Effect substantial life cycle costs and associated savings.

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5. Prevent slippage in an approved production schedule.

Class I ECPs shall contain the following information:

1. Date prepared,
2. Originator,
3. ECP Classification,
4. ECP Number,
5. Reason for change,
6. System designation (nomenclature, model, P/N),
7. Name of part (or lowest assembly) affected to include part numbers,
8. Baselines affected (to include drawings, specifications, CAGE, revision level, etc.),
9. Title of change,
10. Description of change,
11. Effect on interfaces (Interchangeability and Interoperability),
12. Total costs savings,
13. Retrofit information,
14. Ozone Depleting Substances,
15. Impact on any engineering disciplines (such as quality, environmental, safety, health, reliability, maintainability),
16. Justification for change,
17. Priority of change,
18. Impacts to any logistics support elements (such as software, manuals, spares, tools) being utilized by Government personnel in support of the product; and Alternatives evaluated or considered.

Class II ECPs are defined as engineering changes that do not affect the form, fit, or function of the CIs and Computer Software Configuration Item (CSCI) or pertain to lower level CIs. Class II ECPs shall be submitted by the Contractor to the PM-LAV for approval for those engineering changes, which impacts none of the factors listed above. Class II ECPs will be submitted to the program Defense Contract Management Agency (DCMA) representative and a copy furnished to PM-LAV for concurrence of classification under the guidelines presented IAW CDRL A034 Engineering Change Proposals (ECP).

C.3.6.2.1.1 ECP I Priority. Class I ECPs shall have a Contractor assigned priority code on it. The priority code shall be used in determining the relative speed at which an ECP is to be reviewed by the Government. The priorities for the ECPs shall be Emergency (E), Urgent (U), and Routine (R). Once a problem that requires a configuration change has been identified to, or by, the Contractor, monthly status on the development of the solution shall be provided until the formal ECP has been submitted. The status of solution shall be sent to PM-LAV IAW CDRL A034 Engineering Change Proposals (ECP).

C.3.6.2.1.2 Class II ECPs and Requests for Deviation (RFD) Priority. Class II ECPs and Requests for Deviation (RFD) shall be submitted as appropriate IAW CDRL A034 and CDRL A035. Both require Government approval. The Government is allowed fifteen (15) days for review. The Contractor shall resubmit any Class II ECPs or RFDs as Class I ECPs, when directed by the Government.

C.3.6.2.1.3 ECP-RRPL-MI Relationship. Through an ECP the Contractor shall identify any changes to the Recommended Repair Parts List (RRPL) (reference C.3.12.6) as well as the Modification Instructions (MI) (reference C. 3.12.5). The ECP shall identify the date by which the Government needs to contract for the acquisition of the initial spare parts related to the ECP in order to acquire Production Prices. Draft Modification Instructions (MI) shall be submitted with the ECP for information only and will not be judged by the Government for acceptability. If the Government approves the ECP, a final MI may be required. If required, a final MI shall be delivered thirty (30) days after contract modification.

C.3.6.2.1.4 ECP System Training. The Government will provide initial, limited training on the MEARS system if requested by the Contractor. The Contractor shall provide the Government thirty (30) days advance notice if training is required.

C.3.6.2.2 Requests for Deviation. The Contractor shall process Requests for Deviation (RFD) IAW CDRL A035 Request for Deviation (reference C.3.6.2) from current approved configuration documentation. Authorized deviations are a temporary departure from the requirements and do not constitute a change in an approved baseline. Submission of recurring deviations is discouraged and shall be minimized. Where it is determined that a change should be permanent, the Contractor shall process an Engineering Change Proposal. MIL-HDBK-61 provides guidance concerning the classification of RFDs. The RFD shall contain the following information:

1. Date prepared,
2. Originator,
3. RFD Classification (critical, major or minor),
4. Designation for deviation (model or type, CAGE code, system designation, and deviation number),
5. Class of deviation,
6. Part Number affected,
7. Cost and price data,
8. Effectivity,

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9. Description of deviation,
10. Need for deviation,
11. Effect on delivery schedule,
12. Recommended corrective action,
13. Alternatives evaluated.

C.3.6.2.3 Notices of Revision. The contractor shall generate and submit Notices of Revision (NOR) IAW CDRL A034 Engineering Change Proposals (ECP) concurrently with Engineering Change Proposals (ECPs) when technical documentation controlled by another contractor or Government agency requires changes following approval of an ECP. The NOR shall contain the following information:

1. Date,
2. CAGE code,
3. NOR number,
4. Document number,
5. Title of document,
6. Revision letter (current and new), related ECP number,
7. Configuration item (or system) to which ECP applies,
8. Description of revision.

C.3.6.2.4 Notification of Changes to Commercial Equipment and Software. The Contractor shall submit notification to the Government when changes occur to commercial equipment or software, which is being procured or fabricated by the contractor off-the-shelf, and the Government does not control the developers design. The Contractor shall submit a change notice to the Government implementing any Class 2 ECPs and the Government will approve or disapprove the class designation of the ECP IAW CDRL A034 Engineering Change Proposals (ECP).

C.3.6.3 Configuration Status Accounting Phase I and II. The Contractor shall establish and maintain a Configuration Status Accounting (CSA) database, which represents the configuration of the ATWS. The CSA database shall provide the following data:

1. Identification of the currently approved configuration baseline.
2. Status of all proposed configuration changes and the affectivity point of all approved configuration changes.
3. Reconciliation of any difference between the supplier information and contractor practices.
4. Historical data on the evolution of the configuration baseline.
5. A Configuration Status Accounting and Engineering Report (CSA&ER) IAW CDRL A036 - Configuration Status Accounting Information.
6. The status of all Class I and II ECPs and Requests for Deviation shall be included in the CSA&ER. The Government may request a CSA&ER no more than quarterly, up to the date of last vehicle modification.

The CSA&E and ER shall be prepared and delivered IAW CDRL A036 and CDRL A031 Engineering Release Record.

C.3.6.3.1 Configuration Status Accounting Serialized Tracking. The Contractor shall utilize the CSA database to record the serial numbers for primary components of the ATMP delivered to the Government. The contractor shall maintain the information that allows traceability of vendor assigned serial numbers to the USMC ATMP Serial number or IUID. The contractors CSA database shall include the following data elements:

- a. USMC Serial Number or IUID
- b. Vendor Part Number or CAGE Code
- c. Vendor Serial Number
- d. Serialized Part Nomenclature
- e. Date of Report

C.3.6.4 Configuration Management Meetings/Audits.

C.3.6.4.1 Interface Control Working Group. The Contractor shall coordinate and participant in the Interface Control Working Group (ICWG) established to address ATWS interfaces to the vehicle system. The ICWG will meet, as necessary, to resolve any interface problems. Meetings shall be held in conjunction with other reviews, if possible. Interface activities of the ATWS shall include the following interfaces between the LAV-AT hull (Legacy and New Build) and the ATWS:

- Mechanical
- Electrical
- Hydraulic
- Pneumatic
- Software

C.3.6.4.2 Functional Configuration Audit (FCA). The Functional Configuration Audit (FCA) shall be performed to verify the ATWS and its configuration items (CIs) are accurate, complete, and compatible, and the CI has achieved the performance and functional characteristics delineated in the Performance Specification. The FCA shall be performed 30 days prior to the completion of DT. The Government and the

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Contractor shall conduct the FCA jointly, with the government acting as chair. The Contractor shall provide an approach and proposed schedule for conducting the FCA and identification of the CIs/CSCIs to be audited. The Contractor shall participate and assist the Government in the development of the FCA, using the guidelines contained in MIL-HDBK-61, section 8. The Contractor shall be responsible for providing the system to be audited, facilities, personnel and documentation (including drawings). The Contractor shall develop a configuration audit summary report after each audit. The Contractor shall correct all audit discrepancies as documented in the configuration audit summary reports IAW CDRL A037 - Configuration Audit Summary Report (Functional). The functional baseline will be validated upon completion of the FCA and resolution of audit discrepancies.

C.3.6.4.3 Physical Configuration Audit (PCA). The Government and the Contractor shall conduct the PCA jointly with the Government chairing the audit on the ATWS items (i.e. components, assemblies, and sub-assemblies). The PCA shall be completed within 365 days after exercising production option 1 (CLIN 0004AA). The PCA will audit component interfaces with the vehicle. The PCA shall be the formal examination of the as-built configuration of the government selected item against its design documentation. The PCA shall be conducted at the Contractor's or subcontractor's site on a selected candidate(s) of the EMD assets refurbished after completion of IOT&E. The Configuration Audit Plan (CAP), as described in 3.6.4.3.2 below, will be used as the basis for the audit(s). The Government will initially audit no more than 25% of the entire PCA candidates. In order for the Contractor to pass the audit, 95% of audited items must be acceptable at the first attempt. Acceptable is defined as the as-built hardware matches the design documentation (drawing). If the Contractor passes the audit, the Contractor shall correct the remaining identified deficiencies. If the Contractor does NOT pass the audit, the Contractor shall review the entire ATWS TDP and make all necessary corrections to ensure that the as-built hardware matches the drawings. The Government reserves the right to perform additional audits if the first audit is unsuccessful until a 95% level is achieved. Successful completion of the PCA will establish the Final Product Baseline.

C.3.6.4.3.1 PCA Support. The Contractor shall provide the necessary materials, tools and resources to effectively support the PCA. The Prime Contractor may have its vendors available at the PCA.

C.3.6.4.3.2 Configuration Audit Plan (CAP). The Contractor shall prepare and deliver an ATWS CAP IAW CDRL A038 - Configuration Audit Plan. The CAP shall be used as a basis for conducting audits. The Contractor shall ensure that all documentation identified in the CAP, to conduct the audits, are available at the start of the audits. The PCA will be performed on one of the refurbished ATWS.

C.3.6.4.4 Indented Bill of Material (IBOM). As part of the CAP the Contractor shall also deliver to the Government an Indented Bill of Material (IBOM). The IBOM shall represent all ATWS items. The list shall constitute the PCA Candidates List. This IBOM shall be prepared in Contractor format. The IBOM shall contain item number, item name, description, and quantity. The IBOM shall be prepared in indenture level sequence for the ATWS in the LAV-ATA2 IAW CDRL A039 - Indented Bill of Material.

C.3.6.4.5 Summarized Bill of Material (SBOM). This SBOM shall be prepared in Contractor format. The SBOM shall contain item number, item name, item description, the revision date of the specified item, the revision number of the specified item, and the total quantity per item for the ATWS program. The SBOM shall be organized in alpha-numeric order. Prepare and deliver IAW CDRL A040 - Summarized Bill of Material.

C.3.6.5 Parts Management Program. The Contractor shall establish and maintain a Parts Management Program that will ensure the use of parts that meet contractual requirements, reduce proliferation of parts through standardization and enhance equipment reliability and supportability, and proactively manage obsolescence. The procedures, planning and all other documentation media and data that define the Parts Control Program and the parts selected for use shall be made available to the Government for its review and use.

### C.3.7 ENGINEERING DRAWINGS.

C.3.7.1 Technical Data Package. The Contractor shall deliver an Unlimited Rights Production Level Technical Data Package (TDP) for items that are developed exclusively at Government expense under this contract. The Contractor shall deliver a limited rights Production Level TDP for items previously developed at the Contractors expense. The limited rights Technical Data would be limited to uses internal to the Government, in accordance with DFARS 252.227-7013, and will not be released to competitors or other Contractors, absent Contractor consent. The TDP shall conform to the standards found in MIL-STD-31000 and associated documents.

The TDP shall include all technical data (drawings, models, specification, standards, and interface control documents) pertaining to the modification component drawings and component models required to integrate an ATWS into the LAV ATA2 hull, including all interface devices, interface cables and interface weldments. All hull modifications shall require approval of the Interface Control Working Group (ICWG).

The TDP shall include a full Three Dimensional or Two Dimensional (3D/2D) model for every configuration item developed at Government expense IAW CDRL A041 Technical Data Package(TDP). The TDP shall be in the Contractors native format, and be fully parametric and capable of generating 2-Dimensional drawings. The 3D model of the ATWS top assembly shall include the following mass properties: mass, center of gravity, and the moment of inertia information about all axis of rotation, with and without loaded missiles. The TDP data shall also be provided in Standard for the Exchange of Product model data (STEP) format. All 2D drawings shall be taken from the 3D model.

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The TDP shall include limited design disclosure models, as defined by MIL-STD-31000, for subcomponents that do not require complete design disclosure (such as a COTS and NDI), a 3D model of the subcomponent shall be provided that show the assembly and configuration of the end items. The subcomponents 3D model need not be fully defined, but shall be sufficient to provide adequate visualization, interface characteristics, accurate weight and center of gravity information (i.e. cosmetic model).

The Contractor shall disclose and deliver the form, fit, and function information, necessary for operation, maintenance, installation and training of all Configuration Items (CI) for the purpose of provisioning replacement parts, facilitating emergency repair, updating the vehicle TDP, and to allow for future upgrades to the vehicle and technical manuals or new builds.

The Contractor shall submit Interface Control Documents (ICD) of the ATWS top assembly and each of the major Line Replaceable Units (LRU) used in the ATWS and its sub-assemblies. Each ICD shall include electrical, hydraulic, pneumatic, and software interface features IAW CDRL A042 Interface Control Document.

The TDP shall include parts lists, Bills of Materials, and specifications of the components. As part of the TDP, the Contractor shall provide an indentured parts list as follows:

1. A sequence of both part numbers and associated drawing numbers comprising the end item in a lateral and descending family tree or top down breakdown.
2. A top down breakdown of the end item including all lower level items, listing every assembly, subassembly and part.
3. Every item listed in its relationship to the end item, subassembly, assembly or system of which it is a part.
4. A relationship as shown by means of physical indenture or numeric sequence, with the indenture indicating that the item is a part of the preceding item.

Vendor item catalog sheets may be provided for vendor items defined as consumable. Vendor catalog sheets shall be provided as ancillary drawings. The drawing shall contain CAGE Code, vendor part number or other identifying alpha-numeric information required to purchase the item for replacement purposes.

C.3.7.2 Engineering Drawings. The Contractor shall develop complete product engineering drawings and associated lists package in accordance with ASME 14.24M, ASME Y14.34.M, and ASME Y14.100. These drawings shall include assembly and detail drawings down to the piece part. Control drawings shall be developed for all commercial off the shelf, non-developmental items, and items developed exclusively at private expense. These control drawings shall provide the applicable performance specification form, fit, and function, necessary for operation, maintenance, installation, and training, information of that item or an interchangeable item. The Contractor shall deliver engineering drawings IAW CDRL A043 Engineering Drawings.

C.3.7.3 IUID Requirements.

C.3.7.3.1 Sample IUID Tags. In addition to the requirements at DFARS 252.211-7003, The Contractor shall provide one complete set of IUID tags representing each item to be marked in the procurement, in order to give the the Government an opportunity to ensure the marks are being placed IAW the Department of Defense Guide to Item Unique Identification Quality Assurance v1.0 November 20, 2009.

C.3.7.3.2 Pedigree Data. The Contractor shall provide to PMLAV the same pedigree data (CDRL A006- Pedigree Data) that is required to be reported to the UID Registry.

C.3.7.4 Diminishing Manufacturing Sources and Material Shortages (DMSMS). The Contractor shall identify the parts planned to be used as well as those used in the ATWS at all indentured levels. The data may be obtained progressively during any program life cycle phase using sources such as the preferred parts list, Bill of Materials (BOM), vendor surveys and inspections. The information documented at the part level shall be updated as the design progresses or changes and be sufficient to enable forecasting and management of any associated DMSMS issues. In addition the Contractor shall document and deliver a risk assessment identifying potential obsolescence items, impacts of shortage of rare earth materials, and the risk associated with each IAW CDRL A044 Source Data for Forecasting DMSMS.

### C.3.8 TESTING/VERIFICATION.

C.3.8.1 Test and Evaluation Requirements DVT. The Contractor shall conduct Design Verification Testing (DVT) to verify the performance of the ATWS design. The DVT requirement shall be completed no later than 330 days after contract award. Test plans and results of any tests performed by the Contractor to verify ATWS performance shall be made available to the Government at Design Reviews (ref. IPDR, PDR, and CDR).

C.3.8.1.1 Test and Evaluation Requirements DT/OT. During Phase I, the four (4) ATWS turrets will be installed on LAV-ATA2 chassis by the Contractor at the Contractors facility. The Government will conduct Developmental Testing (DT) on all four (4) ATWS per the requirements specified in Section E, paragraph E.7, E.11 of this contract. The Government will conduct Operational Testing on up to three (3) ATWS turrets per the requirements specified in Section E, paragraph E.11 of this contract. The remaining vehicle will be used to support Integrated Logistics Support (ILS) efforts at the Contractor's facility until scheduled for DT RAM testing at YPG.

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C.3.8.2 Design Verification Test (DVT) Plan. The Contractor shall prepare a Test Plan (TP) IAW CDRL A045 DVT Test Plan for Design Verification Testing (DVT) that encompasses all component, sub-system and system level testing. The TP shall be the top-level working document that ties all Contractor and subcontracting test activities together. The following areas shall be emphasized in the test plan:

- a. Test event,
- b. Purpose of the test,
- c. Date of test start and end,
- d. Location of the test,
- e. Need for Government test support, especially laboratories and facilities,
- f. Overall schedule of individual tests,
- g. Interoperability analysis and testing.

The TP shall be provided to the Contracting Officer thirty (30) days prior to execution of any Design Verification testing for review, comment and acceptance.

C.3.8.2.1 Reliability Testing and Reports. As part of the test plan the Contractor shall include reliability testing using MIL-HDBK-781 as a guide. Summary reports and a final report shall be provided to the Government. Summary reports shall also be submitted when significant problems are encountered, which prevent reliability data from being attained IAW CDRL A046 Reliability Test Report.

C.3.8.3 DVT Test Execution Notification. The Contractor shall notify the Contracting Officer via email, five (5) work days prior to executing any of the planned Design Verification Test.

C.3.8.4 Design Verification Test Readiness Review. The Contractor shall conduct a Test Readiness Review (TRR) approximately fifteen (15) days prior to the start of the DVT. The purpose of the TRR is for the Contractor to conduct a formal review of its readiness for testing. Results of the TRR shall be documented and be made available to the Government fourteen (14) days after completion. Prior to the TRR, the Contractor shall update and provide its monthly submittal of the Risk Management Status Report (CDRL A004) to reflect any hardware and software concerns that present risk to successful execution without failure of DVT. Emphasis shall be placed on design maturity using engineering analysis.

C.3.8.5 Design Verification Test Report. The Contractor shall provide the Government with a copy of all Design Verification Test results in one consolidated report in accordance with CDRL A047 Design Verification Test Report.

C.3.8.5.1 KPP/ KSA Failure Reporting. During DVT, The Government shall be notified of any Key Performance Parameter (KPP) or Key System Attribute (KSA) that failed (or is failing) to achieve the allocated threshold. KPP "failures" shall be reported within 24 hours and KSA's within five (5) days. Both shall be followed up in writing in the form of a report IAW CDRL A048 KPP/KSA Failure Reporting .

C.3.8.6 Government Facilities for Design Verification Testing (DVT). If required by the Contractor in the Test Plan, the Contractor shall notify the Government of the need for Government test facilities in order to conduct testing. Government test facilities, such as laboratories shall be requested well in advance of their need. The DoD Major Range and Test Facilities Base (MRTFB) may be used to the maximum extent possible for assistance in requesting test facilities. The Government will provide space as required for secured storage of system support items and for office facilities. The Government will also provide an office that will have furniture, electrical hookups, and a telephone line hookup.

C.3.8.7 Quality Conformance Inspection & Test Procedures (QCI&TP). The Contractor shall perform QCI&TPs of all the ATWS turrets that are used for training or test upon receipt of the ATWS at the training and test site. Prior to the commencement of DT the Contractor or Government shall conduct another QCI&TP of the integrated ATWS and integration components. If an ATWS component is missing or requires replacement, the Contractor shall obtain a replacement and install it. Time to conduct the QCI&TP and to condition the integrated ATWS as operational shall not exceed eight (8) hours per vehicle.

C.3.8.8 Developmental Test Readiness Review. The Contractor shall conduct a Test Readiness Review (TRR), at their facility, approximately thirty (30) days prior to the start of the Developmental Test. The purpose of the TRR is for the Contractor to conduct a formal review of the Contractors readiness for testing. Results of the TRR shall be documented and be made available to the Government five (5) day prior to the start of testing. Emphasis shall be placed on system requirements using Design Verification Test results. All open system deficiencies and their planed corrective action dates will be addressed as part of the Test Readiness Review presentation.

C.3.8.9 Developmental and Operational Test Training. The Contractor shall provide training for the ATWS Developmental Test (DT) and Operational Test (OT): The training will include operator and maintenance training encompassing troubleshooting procedures to the Line Replaceable Unit (LRU) level and remove and replace procedures tasked for organizational level mechanics. The operator training will also include instruction in crew Preventative Maintenance Checks and Services (PMCS). The Training course material shall be in Contractor format and shall be sufficient to support operator and maintenance training. Training course materials content shall be IAW USMC System Approach to Training (SAT) Manual. Courses shall include safety and hazardous instructions. Separate classes are required for DT and OT and shall be completed, for all students within two (2) weeks prior to the start of DT or IOT&E event. The number of students will not exceed twenty-five (25) for either DT or IOT&E training classes.

C.3.8.10 Contractor Support to Government Testing. The Contractor shall provide field service representatives (FSR) to

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support DT at all test sites for the duration of each test performed per the requirements of Section E, paragraph E.11.6 of this contract. For IOT&E, the Contractor shall be available for on- or off-site technical assistance as required within 24-hours. Interaction with the IOT&E Team is at the discretion of the Government. Contractor shall provide the following support for ATWS testing (Section E):

1. System support for on-vehicle components,
2. QCI&TP (see 3.8.7),
3. Service Support.

The Contractor shall provide capable and knowledgeable personnel to support the USMC with on-vehicle maintenance of the ATWS components. The Contractor FSR shall be available to assist during the entire USMC maintenance workday (not to exceed 12 hrs). No maintenance will be performed on weekends unless specifically approved by the Contract Officer Representative (COR).

C.3.8.11 Government Facilities for Developmental Testing (DT). The Government will provide space as required at the DT site(s) for secured storage of system support items and for office facilities. The Government will also provide an office that will have furniture, electrical hookups, and a telephone line hookup.

C.3.8.12 DT-System Support. The Contractor shall provide system support for LAV ATWS DT. System support is defined as providing any required support related to the ATWS configuration for on-vehicle components as well as the integration of the ATWS. The Contractor shall ensure that all replacement parts are available at the test site or delivered within forty-eight (48) hours of notification. The Contractor shall also provide Technical Manuals (TM) applicable to the ATWS for all tests that include all ATWS operations and remove and replace maintenance procedures. The Government will provide LAV General Mechanics tools and one set of SL-3 tools, excluding weapons, for each ATWS test site location as GFE. The Contractor shall also provide TMs applicable to the ATWS for all tests that include all ATWS operations and remove and replace maintenance procedures.

C.3.8.12.1 Spare/Repair Parts (DT System Support Package). The Contractor shall identify and provide a system support package of spare and repair parts and Line Replaceable Units (LRU) in sufficient numbers to the test sites for DT.

C.3.8.13 DT - Test Deficiencies. The Contractor shall be responsible to investigate, and provide a Failure Analysis Corrective Action Response (FACAR) to all Test Incident Reports (TIRs) submitted by the Government as a result of DT per the requirements of Section E, paragraph E.11.8 (inclusive) IAW CDRL A049 Failure Analysis Corrective Action Response (FACAR). The Contractor shall also be responsible for the correction of all deficiencies (Hardware & Software) identified during DT per paragraph E.11.8.3.3 and E.11.8.3.4 of this contract.

C.3.8.14 OT - System Support. The Contractor shall provide system support for three (3) LAV ATWSs during OT as requested by the Government. System support is defined as providing any required support related to the ATWS configuration for on-vehicle components as well as the integration of the ATWS. The Contractor shall provide all unique tools to support the on-vehicle maintenance as well as off vehicle maintenance of the ATWS that is to be performed during IOT&E by the USMC. The Contractor shall ensure that all replacement parts are available at the test site within 48 hours of notification. The Contractor shall also provide TMs applicable to the ATWS for all tests that include, as a minimum, all ATWS operations and remove/replace maintenance procedures.

C.3.8.14.1 Spare/Repair Parts (OT System Support Package). The Contractor shall identify and provide a system support package of spare/repair parts and Line Replaceable Units (LRU) in sufficient numbers to the test sites for OT.

C.3.8.15 OT - Test Deficiencies. The Contractor shall be responsible to investigate, and provide a Failure Analysis Corrective Action Response (FACAR) to all Test Incident Reports (TIRs) submitted by PM-LAV as a result of IOT&E per the requirements of Section E, paragraph E.11.8 (inclusive) and IAW CDRL A049 Failure Analysis Corrective Action Response (FACAR). The Contractor shall also be responsible for the correction of all deficiencies (Hardware & Software) identified during OT per paragraph E.11.8.3.3 and E.11.8.3.4 of this contract.

C.3.8.16 Test Integrated Process Team (TIPT) Meeting. The Government will conduct regularly scheduled Test Integrated Process Team (TIPT) meetings until the start of each test (reference Section E.11.3).

C.3.8.17 Scoring and Assessment Conferences. The Contractor shall attend all Scoring and Assessment Conferences scheduled by the Government in support of all DT and OT efforts (reference Section E. 11.4 & E.11.5).

C.3.8.18 Refurbishment of Phase I (EDM) ATWS. Upon completion of DT/OT the Contractor shall refurbish each ATWS used during testing IAW the requirements specified in Section E, paragraph E.12.

C.3.8.19 First Article Test (FAT) Requirements. Final acceptance of the ATWS shall be obtained upon successful FAT. FAT consists of satisfactory completion of a First Production Turret (ATWS) Inspection (FPTI), Reference C.3.8.20 and the satisfactory completion of Product Verification Testing (PVT), Reference C.3.8.21. Section E, paragraph E.14 (inclusive) provides the detailed requirements for FAT.

C.3.8.20 First Production Turret (ATWS) Inspection (FPTI). FPTI shall be conducted by the Contractor at the Contractor's facilities per the requirements of Section E, paragraph E.15 (inclusive) and the FPTI requirements of the ATWS Performance Specification

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(Attachment 0001). The Contractor shall be required to correct all deficiencies discovered during FPTI and submit a final report IAW CDRL A050 First Production Turret (ATWS) Inspection Report, to the Government for conditional acceptance (Section E.15.2 15.4). Upon satisfactory completion of FPTI, the First Production Turret shall be retained at the Contractor's facility as the manufacturing standard (Section E.15.5).

C.3.8.21 Production Verification Testing (PVT). After successful completion of FPTI the Government shall select two (2) ATWS from the first lot produced and subject them to PVT. PVT shall be performed per the requirements of Section E, paragraph E.16 (inclusive) and the ATWS Performance Specification (Attachment 0001).

C.3.8.22 PVT Contractor Test Support. The Contractor shall provide field service representatives (FSR) to support PVT at all test sites for the duration of each test performed per the requirements of Section E, paragraph E.16.5 of this contract. Contractor shall provide the following support for ATWS testing (Section E):

1. System support for on-vehicle ATWS components,
2. QCI&TP (for part 2) (reference Section E, paragraph E.4),
3. Field Service Support.

The Contractor shall provide capable and knowledgeable personnel to support the USMC with on-vehicle maintenance of the ATWS components. The Contractor FSR shall be available to assist during the entire USMC maintenance workday (not to exceed 12 hrs). No maintenance will be performed on weekends unless specifically approved by the Contract Officer Representative (COR).

C.3.8.23 PVT Government Facilities. The Government will provide space as required at the PVT site(s) for secured storage of system support items and for office facilities for use by the Contractor FSR. The Government will also provide an office that will have furniture, electrical hookups, and a telephone line hookup.

C.3.8.24 PVT System Support. The Contractor shall provide system support for LAV ATWS PVT (reference Section E, paragraph E.16.5). System support is defined as providing any required support related to the ATWS configuration for on-vehicle components as well as the integration of the ATWS. The Contractor shall ensure that all replacement parts are available at the test site within 48 hours of notification. The Contractor shall also provide Technical Manuals (TM) applicable to the ATWS for all tests that include all ATWS operations and remove and replace maintenance procedures. The Government will provide LAV General Mechanics tools and one set of SL-3 tools (excluding weapons or communication equipment tools) for each ATWS test site location as GFE. The Contractor shall also provide TMs applicable to the ATWS for all tests that include all ATWS operations and remove and replace maintenance procedures.

C.3.8.25 PVT - Spare/Repair Parts. The Contractor shall be responsible for providing a system support package of spare and repair parts to the PVT test site. Spare and repair parts for the initial provisioning of the ATWS shall be supplied under the first production option and delivered ten (10) days prior to PVT.

C.3.8.26 PVT Spare/Repair Parts for Test Support. The Contractor shall, for the support of PVT, identify and provide those parts and Line Replaceable Units (LRU) in sufficient numbers to support PVT. The list shall be provided at Production Readiness Review. The Contractor shall ensure that any replacement part not in the system support package at any test site is available at the test site within forty-eight (48) hours of notification.

C.3.8.27 PVT Scoring and Assessment Conferences. The Contractor shall attend all Scoring and Assessment Conferences scheduled throughout and at the conclusion of PVT (Section E.16.5).

C.3.8.28 PVT Test Incident Report (TIR) Closeout Meeting. Upon conclusion of PVT, the Government shall hold a TIR Closeout meeting per Section E, paragraph E. 11.5 to determine the status and action required to close all remaining open TIRs.

C.3.8.29 PVT Refurbishment. Upon completion of PVT, the Contractor may be required to refurbish each ATWS used during PVT IAW the requirements specified in Section E, paragraph E.17.1.

C.3.8.30 PVT - Test Deficiencies. The Contractor shall be required to investigate, and provide a Failure Analysis Corrective Action Response (FACAR) to all Test Incident Reports (TIRs) submitted by the Government for response as per Section E, paragraph E.16.5.1 and E.11.8 IAW CDRL A049 - Failure Analysis Corrective Action Response (FACAR). The Contractor shall also be responsible for the correction of all deficiencies (Hardware & Software) identified during PVT per paragraph E.16.4 and E.16.4.1 of this contract.

C.3.9 INTEGRATED LOGISTIC STUPPORT.

C.3.9.1 ATWS Integrated Logistic Support (ILS) Program Overview. The Contractor shall plan and conduct an Integrated Logistics Support (ILS) program, which shall govern the management of the ILS effort. The ILS effort shall be conducted as an integral part of the development and integration process to define the range and depth of the required support, and address all applicable and related elements of logistics. The objectives of ILS are to optimize material readiness; provide cost effective logistics support; and identify and evaluate resources required to develop, acquire, manage, and maintain and sustain the ATWS.

C.3.9.2 ILS Management Team/Integrated Product Team. A joint Government and Contractor ILS Management Team/Integrated Product Team

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(ILSMT/IPT) shall be established to monitor the status of the ILS program implementation. The ILSMT/IPT shall provide a means for coordinating logistic matters, schedules and SOW performance, ensuring adequacy and timeliness of Government inputs and action, and assisting the Government ILS manager in discharging their responsibilities. The Government will appoint the chairperson of the ILSMT/IPT. Sub-teams or committees may be established as necessary to monitor such program elements as tests or demonstrations.

C.3.9.3 ILSMT/IPT Meetings. On the average of once every two (2) months, the joint ILSMT/IPT shall meet to review ILS program progress. The meetings shall be scheduled to coincide with assigned deliveries of the formal and informal logistics documentation items and assemblies being reviewed. The purpose of these meetings is to provide a forum to review the logistics data. The meetings will address these 11 Logistic Elements:

1. Condition Based Maintenance and Maintenance planning.
2. Reliability Centered Maintenance (RCM) analysis.
3. Supply support and provisioning.
4. Test Equipment and Equipment support.
5. Manpower and personnel.
6. Training and training support.
7. Technical data (manuals and drawings) and configuration management (CM).
8. Computer Resources support.
9. Facilities.
10. Packaging, Handling, Storage and Transportation (PHS&T).
11. Design Interface.

The contractor shall conduct a Front End Analysis Team (FEAT) meeting that shall occur on a date mutually agreeable between the Government and the contractor. The FEAT meeting shall occur prior to the commencement of Preliminary Design Review (PDR). The purpose of the meeting, and any required follow-on meetings, is for the FEAT to analyze, plan, and facilitate the design and development of the tech pub data. The team shall include at least one Government representative who is a maintenance subject matter expert (SME) and at least one Contractor representative who is responsible for drafting the tech pub data. The team will meet to determine the operation and maintenance tasks that are required to support the configuration of the ATWS. The tasks shall be developed in manner to ensure they are in accordance with the Marine Corps maintenance concept as outlined in Attachment 0008, Levels of Maintenance. As an output of the FEAT efforts, the Contractor shall provide (as part of the meeting minutes) a list of the tools needed for each task. The tools identified shall optimize the use of tools already included in the LAV maintenance tool sets. The PM-LAV tool set lists shall be provided to the contractor as Government Furnished Information under Attachment 0004, GFE/GFI. The Contractor shall notify the Government whenever a task requires a special tool unique to the support of the ATWS. In addition, as part of the FEATs efforts, the Contractor shall provide a map of tech pub changes based on the FEATs findings. The map shall be provided (as part of meeting minutes) in matrix format that displays all the chapters and paragraphs of all the LAV tech pubs.

All ILSMT/IPT meetings shall be held at times and places mutually agreed to by the Government and Contractor. For all ILS IPT meetings, the agenda shall provide for status reporting, analysis of problem areas, evaluation of schedules and proposed changes to the ILS program. Each open agenda item shall have a completion date and the action officer responsible shall provide the status at subsequent meetings. ILSMT/IPT meetings shall normally be conducted in conjunction with IPR's.

C.3.9.4 Integrated Logistics Support Process. The Contractor shall have a documented ILS process that identifies how the ILS elements will be used to meet the logistics support requirements for the ATWS. The ILS process shall also assign responsibilities and establish milestones for executing the ILS program. The Contractor shall describe the process, involving both the Government and the Contractor, which shall be employed in planning, developing, and acquiring the logistics resources for test support and operational support at all specified maintenance levels. The ILS process shall ensure the ATWS, when fielded, will satisfy all supportability criteria. The Contractor shall review and update the Integrated Support Plan (ISP), reference C.3.14.5 to reflect changes emanating from program changes, reviews and other actions affecting the logistics aspects of the program. The Contractor's program and process shall be available for Government review, upon request.

C.3.9.5 Notification of Tools Required for Logistics Demonstrations/Meetings/Reviews. The Government will provide a General Mechanics tool kit. The Contractor shall notify the Government of common tools required for ILS development that are not contained in the GFP tool kits NLT thirty (30) days prior to each Logistics Review. The Government will make every effort to acquire the required common tools for the Contractor prior to the Logistics Review. If the Government cannot provide the common tool, the Contractor shall submit a cost proposal to the Government for approval prior to acquiring the tools. The Contractor shall not delay its ILS development because a common or special tool is not available. The Contractor shall supply all unique and special tools and Test Measurement and Diagnostic Equipment (TMDE) necessary to support the logistics reviews. If a given unique tool or TMDE has a unit price greater than \$5,000, the Contractor shall obtain permission from the Government to procure it.

C.3.9.6 Integrated Support Plan (ISP). The Contractor shall develop and update the Integrated Support Plan (ISP) for the ATWS system to support a 95% system Operational Availability. The Contractor shall develop and update the ISP for the continued management and execution of the ILS strategy of two levels and five echelons of maintenance, in accordance with Attachment 0008, U.S. Marine Corp Maintenance Concept, for the LAV sub-systems. For definition to be used in assigning these Levels of Maintenance, see Attachment 0008. The ISP shall include an interim support plan that identifies all requirements and addresses the Integrated Logistics Support (ILS) concerns until IOC or stand-up of ATWS I-Level repair capability. The ISP shall address field support for all ILS elements and ensure

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each of these is in place to support first Operational Testing (OT). Provisioning planning shall also be addressed in the ISP.

C.3.9.7 Maintenance Planning. The Contractor shall conduct maintenance planning using Condition Based Maintenance Plus to define optimal maintenance activities which fully support the ATWS maintenance concept. The Contractor shall conduct a LORA and a Reliability Centered Maintenance Analysis IAW SAE-JA1011/1012, NAVAIR 00-25-403. LORA shall be completed prior to RCM. RCM shall be completed no later than 20 days prior to CDR. Design influence for maintenance planning and ease of maintenance shall be affected. The maintenance concept for the ATWS is defined below.

C.3.9.8 Logistics Data Development. The Contractor shall develop logistics management information (LMI) data that is supported by the Contractor engineering design efforts. MIL-PRF-49506 may be used as guidance. The Contractor shall establish an ATWS logistics database that is consistent with the U.S. Marine Corp Maintenance Concept (Levels of Maintenance Attachment 0008). The ATWS database shall contain: tools, parts, components, bulk items, indenture levels, Source Maintenance Recoverability (SMR) Codes, Military Occupational Skills (MOS), and maintenance times to perform each task. Additional database requirements may be identified at the Start of Work Meeting.

C.3.9.8.1 Management of Logistics Data. The Contractor shall maintain and update its logistics documentation. Each update shall be considered as new data for purposes of review, approval, and delivery. Data shall be updated to reflect changes in support requirements resulting from logistics support improvements or corrections resulting from a Government or Contractor analysis of testing data.

C.3.9.8.2 Military Occupational Specialties (MOS). The Contractor shall use existing USMC LAV MOSs when identifying the appropriate MOS for operating and maintaining LAV ATWS. All operation and maintenance procedure must be able to be performed by the capabilities of the existing MOSs. A copy of the USMC Military Occupational Specialties (MCO P1200.7S) is provided in Attachment 0010.

C.3.9.9 Supportability Demonstration (SD). During Phase I, the Contractor shall plan and conduct a Supportability Demonstration (SD) to identify any needed improvements to materiel design for improved supportability and reduced life-cycle cost. Supportability Demonstration shall not begin until at least 120 days after DT has started and shall be completed by DT completion. The Contractor shall notify the Government ten (10) days prior to execution of the demonstration(s) and provide for Government participation. The Contractor shall perform all work necessary to develop, fabricate and deliver the System Support Package that will be evaluated during the SD. Operator and maintenance personnel performing the SD will be trained and equipped as specified by the logistic concept being tested and will be representative of personnel described in the target audience description. For the SD, the Contractor shall also make available the applicable ATWS components, spare/repair parts, common tools and special tools, TMDE, support equipment, consumable items not bulk items that were identified during the Contractor's logistics development. The SD will be performed to evaluate the achievement of the following:

1. Maintainability goals: Review the design to verify achievement of maintainability goals and to identify supportability deficiencies.
2. Verification of ATWS data: Review of data to ensure it is consistent with the logistics strategy and the Marine Corp Maintenance Concept.
3. Preplanned Product Improvement (P3I): Identification of needed improvements to materiel design for improved supportability and reduced life-cycle cost.
4. System Support Package (SSP): Evaluate the preliminary SSP to include the interface of TMDE and other support equipment with the end item.
5. System safety: Review the design to ensure identification of operation and maintenance hazards, and confirm the safety of all procedures and tasks.
6. Equipment publications: Review and verify the draft equipment publications to include:

a. Test Measurement Diagnostic Equipment (TMDE) Bill of Materials (BOM). A listing of tools and Test Measurement Diagnostic Equipment (TMDE) required for each operational task and/or maintenance task according to its applicable echelon. The Contractor shall identify the tools as either special or common. Special tools are those not currently available to the USMC (list provided as GFI). The Contractor shall provide a cost estimate and Procurement Lead Time (PLT) for procurement of the special tools in the quantity required for the applicable maintenance echelons.

b. Fault diagnosis and calibration procedures: Confirm fault diagnosis procedures and testability using Built-in test/built-in test equipment (BIT/BITE), Automatic Test Equipment (ATE) and software programs, and external TMDE.

c. Maintenance tasks and procedures: Confirm the calibration procedures, maintenance tasks and repair and replacement procedures through the removal and replacement of the component parts for the system, system TMDE, and support equipment.

d. Technical Manuals and Illustrations: Verify all technical manuals and illustrations match actual equipment configuration and interfaces as well as proper sequencing for disassembly and assembly procedures.

7. Task and skill requirements: Perform Maintenance Task Analysis (MTA) and validation summary to include confirmation and demonstration of task and skill requirements for operator and maintenance personnel by level of maintenance.

8. Provisioning and Cataloging. Review and verify provisioning data, drawings, sketching to ensure part numbers and nomenclatures, to include the system in a top-down breakdown structure, are in adequate detail for cataloging in DoD inventory systems. The system shall include all interface hardware.

9. Maintenance time standards: Confirm maintenance time standards for maintenance functions through performance of the task by properly trained military maintenance personnel and verify maintenance manpower and personnel requirements.

10. Training curriculum: Training curriculum verification.

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C.3.9.10 Supportability Demonstration Plan. The Contractor shall develop and submit a joint SD Plan IAW CDRL A051 Test Procedure (SD). The SD Plan shall contain the Government and Contractor cooperative plans and procedures for a combined demonstration of the logistic supportability of the system. The SD plan shall contain a statement of demonstration objectives and the qualitative and quantitative requirements to be demonstrated. The contents of the plan shall contain a description of the demonstration conditions. The following areas shall be addressed:

1. A listing of tasks to be demonstrated to accomplish the requirements specified in the System Demonstration (SD).
2. Demonstration conditions including the following:
  - a. The principal operating modes, operating time and cycling conditions to be imposed.
  - b. A description of the demonstration facilities and instrumentation requirements, including location.
  - c. The mode of operation during the demonstration considering configuration and mission requirements.
  - d. Demonstration constraints such as manpower (by number and skill level), test equipment and their relationship to the eventual use of the items.
  - e. Demonstration of firmware and software update conditions to be imposed as part of system support.
3. The types and quantities of equipment and materials to be used including Government Furnished Equipment (GFE).
4. The maintenance concept.
5. Schedule of events.
6. Provisions for a pre-demonstration phase to prepare facilities, personnel and equipment for the formal demonstration.
7. Expected results, including the following:
  - a. The method to be used to report test levels.
  - b. The data expected from each test along with the recording methodology and definition of ILS data elements to be collected.
  - c. Analytical methods and calculation procedures to be used to analyze demonstration data.
  - d. The criteria for classifying demonstration results as successes or failures. Definition of failure must relate to expected symptoms, which will be observed by operators and maintenance personnel.
8. The plan of action to be used when demonstration failures occur.

C.3.9.11 Supportability Demonstration Test Report. The Contractor shall develop and submit a SD test report IAW CDRL A052 Test Inspection Report (SD) documenting the results of the SD. The Contractor shall provide a hotwash or quick look report immediately following the SD to the program office in addition to the official final SD test report.

C.3.9.12 Test Measurement and Diagnostic Equipment. As applicable, the Contractor shall develop Test Program Sets (TPS) and utilize the Marine Coprs Virtual Instruemnt Protoble Electronic Repair / Tester (VIPER-T) test set to support ATWS if the trouble shooting and diagnostic capabilities is beyond the capability of the system BIT/BITE (Built-in Test / Built-in Test Equipment). The AN/USM-717(V) 3 VIPER/T EOVS will be the general-purpose test equipment that forms the basis of Field Level maintenance for electronic subassemblies, optics and lasers associated with the ATWS. The Contractor shall develop TPS with the necessary software and hardware required to interface with and test turret electronic and optical subassemblies utilizing the VIPER/T-EOV. After evaluating VIPER/T EOVS test capabilities against the test requirements for ATWS system subassemblies, the Contractor shall provide detailed pricing and outline its approach for the development of TPS. The Government will provide two (2) VIPER/T EOVS systems as GFE to the Contractor along with technical data for the system as required to support TPS development. The Contractor shall reference the TPS in applicable ATWS test and troubleshooting procedures:

1. Properly test, during DVT, the TPS against the ATWS components, and ensure that the resulting diagnostic software, interfacing hardware and test and troubleshooting procedures are validated.
2. Deliver two (2) prototype TPS (hardware, software, and/or firmware) and hardcopies of the test and troubleshooting procedures IAW CDRL A053 Manuals, Technical: Troubleshooting Procedures along with BIT/BITE fault codes listing to a Government-designated test site NLT fourteen (14) days prior to DT and IOT&E.

C.3.9.13 Training Program Plan (TPP). The Contractor shall provide a Plan of Action and Milestones (POA&M) for the training program as a portion of, and in accordance with, CDRL A054 Technical and Management Work Plan ( ATWS Training Program Plan). The POA&M shall identify proposed course dates, proposed Critical Task Analysis dates, proposed 30%, 60%, and 100% review dates, and delivery dates for draft and final training materials. All training material deliveries shall include a current state copy of the systems Technical and Operator Manuals.

C.3.9.13.1 Training Program Progress Reports. The Contractor shall develop Training Program Progress Reports IAW CDRL A055 Program Progress Report. The Contractor shall provide Training Program Progress Reports to inform the Government on matters related to design and development of training materials and planning for training events per the Contract. The Contractor shall use the Government-approved Technical Management Plan of Action and Milestones (POA&M) for the training program proposed in the Training Program Plan (TPP) to identify training dates and delivery dates of draft and final training materials. Progress on this POA&M must be included in the Program Progress Reports. The Contractor shall include the status on all training materials, a list of problem areas encountered and solutions or alternatives proposed or executed, and expenditures to date in each report. The Contractor shall provide samples of training materials under development for the Governments inspection as required per the schedule identified and accepted in the Training

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Program Plan (TPP). The Contractor shall prepare in Contractor format the Training Program Progress Reports.

C.3.9.13.2 Training Courses. The training courses will consist of lectures, demonstrations, practical application, and evaluation.

C.3.9.13.3 Operator Training. The course shall be designed for LAV-AT Operators, covering complete operation (capabilities, limitations, interfaces, attachment and detachment procedures) and safety of the vehicle, armor kit(s), correct use of equipment, SL-3, before, during, and after weekly and monthly operations Preventive Maintenance Checks and Services (PMCS), troubleshooting, and tools used for operator maintenance tasks. The training shall be consistent with the procedures established in the appropriate LAV-AT technical manual. Upon completion of instruction, the Contractor shall conduct a written test and performance (hands-on) test for each operator trainee.

C.3.9.13.4 Maintainer Training. The course shall be designed for maintainers (mechanics) of the LAV-AT, covering minimal operation characteristics, Field Level PMCS, TMDE utilized for diagnostics, troubleshooting, and repair and replacement of equipment components to include sub-system, unique control systems, and installation of the armor kit(s). The training shall be consistent with procedures established in the appropriate LAV-AT technical manual. Upon completion of instruction, the Contractor shall conduct a written test and performance (hands-on) test for each maintainer trainee or small group of trainees.

C.3.9.13.5 Training Material Development. The Contractor shall develop the LAV-AT Operator and Maintainer (Mechanic) training courses using Contractor-developed training materials. No classified information shall be included in the training materials. Materials submitted shall not conflict with the content of the LAV-AT technical manuals. Training materials shall be developed at the tenth (10th) grade reading and comprehension level. The training courses will consist of lectures, demonstrations, practical application, and evaluation. Operator training shall be structured to provide no more than 30% classroom (lecture) and 70% practical application (hands-on) on equipment. Maintainer training shall be structured to provide no more than 40% classroom (lecture) and 60% practical application (hands-on) on equipment. Training course class sizes shall be no more than twenty-five (25) students. The student to instructor ratio shall be no more 25:1 for lectures, 5:1 for practical application hands-on training, and 1:1 for practical exercises. The training material will be developed to accommodate a forty (40) hours in length, five (5) eight-hour day course. The Training course material shall be in Contractor format and shall be sufficient to support operator and maintenance training. Training course materials content shall be IAW USMC System Approach to Training (SAT) Manual. The Contractor shall be responsible for providing all training course material to the students.

C.3.9.13.6 Training Program Structure Documentation (Curriculum) Development. The Contractor shall develop the Training Program Structure Documentation (Curriculum Outline of Instruction) IAW CDRL A056 Training Program Structure Documentation. The outline shall identify the ATWS (Operator and Maintainer) training class schedule of events and include a breakdown of individual topics showing the learning objectives and time allotted, instructional materials required, facilities and instructor requirements, media and training support equipment, reference materials, type of instruction (lecture, demonstration, practical application), and tools and TMDE required for each period of instruction. The Government (USMC) approved Critical Task Analysis shall be used as the basis for the development of the course curriculums. The Contractor shall submit draft Curriculum Outline of Instruction, sixty (60) days prior days prior to I&KPT training. The Government will provide comments at the conclusion of the I&KPT.

C.3.9.13.7 Training Conduct Support Document (Lesson Plan) Development. The Contractor shall develop the Training Conduct Support Document (Lesson Plan Data Requirements). Lesson plans shall be sequenced and contain information relevant to each period of instruction including training objectives and instructions for the delivery of training, equipment required, application of training visual aids, written test questions, and task performance checklists. Time required for delivery of an individual period of instruction lesson plan shall not exceed four (4) hours. The Contractor shall prepare the Course Conduct Support Documentation (Lesson Plan Data Requirements) IAW the CDRL A057 Training Conduct Support Document (Lesson Plan Data Requirements).

C.3.9.13.8 Training Test Package Development. The Contractor shall develop the ATWS Training Test Package. The test package shall include written and performance tests based upon the Critical Task Analysis. Written test items shall consist of true/false, multiple choice, and fill-in-the-blank questions. The test questions shall be written to evaluate the trainees comprehension of knowledge-based learning objectives and the Test Packages shall include a minimum of three test items for each learning objective. The performance tests shall be developed to evaluate the trainees ability to perform specific Operator or Maintainer task and subtasks and shall be presented in checklist format. The Contractor shall prepare the Test Package IAW CDRL A059 Test Package.

C.3.9.13.9 Instructor & Key Personnel Training (I&KP) Courses - Phase II. The training shall cover only ATWS hardware and the interfaces with the LAV-ATA2. The Contractor shall conduct training courses for both ATWS operators and maintainers using training materials developed under this contract. The Contractor can include personnel from the formal schools, and other Government nominees to help with I&KP. The Government will provide two (2) LAV-ATA2's, with ATWS installed. The Contractor shall provide all ATWS unique special tools and parts required to support the training and all replacement parts and consumables during the training. This I&KPT is for the purpose piloting and verifying the training materials developed for New Equipment Training under this contract. The location for the training will be at Fort Lee, Virginia. Training materials shall be submitted IAW CDRL A060 Course Conduct Information Package.

C.3.9.13.10 New Equipment Training (NET). The Contractor shall conduct NET to support the Government (USMC) fielding plan and material handoff to units. The Contractor shall conduct operator and maintenance training for a maximum of two (2) classes each at the Marine Expeditionary Force (MEF) I, II, III and 4th Marine Division (Reserve Units). Training shall coincide with delivery of the upgraded LAV-

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ATA2's at the organizations (MEFs). Training dates will be determined by the Government (USMC) and provided to the Contractor at least thirty (30) days in advance for Continental United States (CONUS) training, and include instructions, dates, and locations. The Contractor shall provide a copy of the approved training materials to each units Training Officer. Training materials shall be submitted IAW CDRL A061- New Equipment Training (NET) Material.

C.3.9.13.11 Training Aides, Devices, Simulations, and Simulators (TADSS). The Contractor shall identify and recommend to the government TADSS that support, enhance, and facilitate the transfer of knowledge, skills, and abilities of Marine Operators and Maintainers. Recommended TADSS should focus on being easily employed by instructional staff, and be effective and efficient in the facilitation of instruction of critical training tasks.

C.3.9.13.12 Training Development Management. The Contractor shall appoint a Training Manager who shall be the single point of contact for training and courseware development matters. The Training Manager and other Contractor personnel conducting training shall be able to read, write, speak and comprehend the English language, including technical language and terms associated with the operation, repair, installation, maintenance, assembly, and disassembly of the ATWS. The Training Manager shall have three or more years of training and managerial experience with formal military training, and shall have an understanding of all tasks to be taught under this contract, with expertise in one or more of the areas. Sixty (60) days prior to the conduct of any training course, the Contractor shall provide written certification of the proficiency and skill of the instructors to conduct the required training to the Government. Sufficient proficiency and skill is defined as either two years experience conducting formal military training in the specific area of instruction or an equivalent level of civilian teaching experience. The Government will consider waivers to proficiency and skill levels on a case-by-case basis. The Government will review and approve Contractor proposed instructors thirty (30) days prior to the start of training. The duties of this Training Manager shall include the coordination of training courseware analysis, design, and development. Additionally, the Training Manager shall be responsible for the coordination of training presentation for the ATWS.

#### C.3.10 SUPPLY SUPPORT.

##### C.3.10.1 Conferences.

C.3.10.1.1 Provisioning Guidance Conference. The Contractor shall host the Provisioning Guidance Conference (PGC) and furnish provisioning data as one product of the PGC at mutually agreed upon intervals prior to the provisioning conference(s). The Government will clarify any provisioning issues during the evolution of the data cleansing process.

C.3.10.1.2 Provisioning Conference. The Contractor shall host a Provisioning Conference(s) at the Contractor's facility. The Contractor shall provide and disassemble production grade equipment, as deemed necessary by the Government, during this conference to validate and verify all provisioning documentation.

C.3.10.2 Provisioning Plan. The Contractor shall establish, manage, and execute a Logistics Management Information (LMI) program and plan in accordance with MIL-PRF-49506. MIL-HDBK-502 may be used for additional guidance. The LMI program shall be the basis for the integration of the logistics support element, and provide the interface between the engineering and integrated logistics effort used in the systems engineering effort. The objectives of the LMI program are to provide optimum material readiness, economical logistics support, and identify and evaluate resources required to develop and manage an effective support system. All design, modification or alteration, and engineering activity shall require LMI. Provisioning status, identification of problem area(s), and necessary resolutions to problems addressed shall be discussed at each ILSMT/IPT.

C.3.10.3 Provisioning Master Record (PMR). The Contractor shall develop provisioning data to support the ATWS program IAW MIL-PRF-49506. The Contractor shall arrange the provisioning data in a top-down breakdown sequence. MIL-HDBK-502 may be used as a guide. The data shall be delivered 45 days prior to provisioning conference IAW CDRL A085 Provisioning Master Record. At the SOW meeting the Government will provide the Contractor with the Marine Corps Interactive Computer Aided Provisioning System (MICAPS) software that the Contractor shall use in preparing and delivering the provisioning data.

C.3.10.4 Provisioning Screening. The Contractor shall submit provisioning screening to the Defense Logistics Information Service (DLIS) forty-five (45) days prior to the provisioning conference IAW CDRL A062 Provisioning Screening. The data shall address complete assemblies for each Logistics Review. The Contractor may use LOGRUN for this effort. The Government may waive the submission of the screening forty-five (45) days prior to a logistics review and perform "Rapid Provisioning" at the conference using laptops and DVD's from DLIS.

C.3.10.5 Provisioning Technical Documentation. The Contractor shall develop and document Provisioning Technical Documentation IAW CDRL A063 Provisioning Technical Documentation, to include a Provisioning Parts List (PPL), Long Lead Time Items List (LLTIL), Special Tools and Test Equipment (STTE), Common and Bulk Items List (CBIL), and any Design Change Notices (DCN). The Government at the Provisioning Guidance Conference (PGC) shall designate the format and medium of delivery. The frequency for submission of such lists shall also be designated at the PGC.

C.3.10.5.1 Provisioning Parts List. The Provisioning Parts List (PPL) is a tool used to determine the range of support items required to maintain the end item for an initial two (2) years of service as part of CDRL A063 Provisioning Technical Documentation This period of service is also known as the "demand and development period", during which time usage data is tracked and used to determine future sustainment requirements. The PPL shall contain the end item, component or assembly and all support items which can be disassembled,

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reassembled, or replaced, and which, when combined, constitute the end item, component or assembly. The PPL shall include items such as parts, materials, connecting cabling, piping, and fittings required for the operation and maintenance of the end item, equipment, component, or assembly. This includes all repairable Commercial Off-The-Shelf (COTS) items unless excluded by the provisioning requirements. It does not include a breakdown of Government Furnished Equipment (GFE). The PPL shall contain repair kits and repair parts sets required to maintain the end item, component, or assembly equipment unless excluded by the provisioning requirements or meeting the requirement for Common and Bulk Items List (CBIL) inclusion if CBIL is a contract requirement.

C.3.10.5.2 Long Lead Time Items List. The Contractor shall provide a Long Lead Time Items List (LLTIL) as part of CDRL A063 Provisioning Technical Documentation that shall contain those items which, because of their complexity of design, complicated manufacturing process or limited production capacity, may cause production or procurement cycles which would preclude timely and adequate delivery, if not ordered in advance of normal provisioning.

C.3.10.5.3 Special Tools and Test Equipment (STTE). The Contractor shall provide a Special Tools and Test Equipment (STTE) as part of CDRL A063 Provisioning Technical Documentation that shall contain those support items required to inspect, test, calibrate, service, repair, or overhaul an end item.

C.3.10.5.4 Common and Bulk Items List. The Common and Bulk Items List (CBIL) as part of CDRL A063 Provisioning Technical Documentation contains those items that are difficult or impractical to list on a top down disassembly sequence PPL, but for which provisioning may be required to support the operation of the end item. These items are subject to wear or failure, or otherwise required for maintenance, including planned maintenance of the end item or equipment. The Contractor shall indicate the material type, grade and class. The Contractor shall submit sufficient information to enable the Government to relate the material or specification number to the pertinent item.

C.3.10.5.5 Design Change Notice. The Contractor shall use a Design Change Notice (DCN) to identify changes to Provisioning Technical Documentation which add to, delete, supersede, or modify items previously listed which are approved for incorporation into the end item as part of CDRL A063 Provisioning Technical Documentation.

C.3.10.5.6 Engineering Data for Provisioning (EDFP). The Contractor shall deliver the EDFP 30 days prior to provisioning conference IAW CDRL A064 Engineering Data for Provisioning (EDFP). This is technical data used to describe parts and equipment and consists of data such as specifications, standards, drawings, photographs, sketches and descriptions, and necessary assembly and general arrangement drawings, schematic drawings, schematic diagrams, wiring and cable diagrams necessary to indicate the physical characteristics, location, and function of the item. EDFP must provide:

1. Technical information of items for maintenance support considerations.
2. Item identification and descriptions necessary for;
  - a. Cataloging actions and assignment of a National Stock Number.
  - b. Review for item entry control.
  - c. Standardization to include standardization and interchangeability.
  - d. Item management coding.
  - e. Identification and procurement of initial spares.
  - f. Preparation of allowance or issue lists.

The Contractor shall furnish EDFP in the following order of precedence:

1. Government or industry recognized specifications or standards.
2. Engineering drawings.
3. Commercial catalogs or catalog descriptions.
4. Sketches or photographs with brief descriptions of dimensional, material, mechanical, electrical, or other descriptive characteristics.

EDFP shall be submitted in hard copy. EDFP shall be marked in such a manner as to identify the proprietary rights (limited or unlimited). EDFP shall also be marked with the Provisioning Line Item Sequence Number (PLISN) in the upper right hand corner. EDFP shall NOT be provided when the item is:

1. Identified as a Government specification or standard which completely describes the item including its dimensional, mechanical, and electrical characteristics.
2. Previously cataloged and assigned an active National Stock Number with type 1 item identification.

C.3.10.5.7 Provisioning Software. The Contractor may request to use in-house software to develop the provisioning master files. Any software utilized to develop provisioning data shall be approved by the Government.

C.3.10.6 Initial Spare/Repair Parts. The Contractor shall deliver a listing of spare and repair parts, assemblies, and tools for government review and approval as part of CDRL A067 Recommended Repair Parts List (reference section C.3.12.6). The Government will review the listing and may select items that will be added to the contract in conjunction with exercise of first production option. All parts shall be delivered within the designated production lead time of each production option.

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C.3.10.7 Request for Nomenclature. The Contractor shall submit a Request for Nomenclature as part of CDRL A064 Engineering Data for Provisioning (EDFP) for the ATWS. This requirement is mandatory for use in type designation of communications and electronic materiel.

C.3.11 POWER.

C.3.11.1 Lithium Batteries.

C.3.11.1.1 Lithium Battery Safety Qualification. If lithium batteries are part of the system configuration, the Contractor shall develop a safety data package that shall document and demonstrate the stability of design and validity of the lithium battery selection IAW NAVSEAINST 9310.1B and TM S9310-AQ-SAF-010. The Contractor shall provide data from Contractor testing of the complete system or item.

C.3.11.1.2 Lithium Battery Test Articles. If lithium batteries are part of the system configuration, the Contractor shall provide batteries within thirty (30) days after Government notification. The Contractor shall include battery safety test results in its System Safety Program Plan and Safety Assessment Report.

C.3.11.1.3 Lithium Battery Safety Assessment. If lithium batteries are part of the system configuration, the Contractor shall document all Contractor and Government lithium battery safety assessment efforts in the Safety Assessment Report (SAR). The SAR shall include the lithium battery risk assessment, recommendations, procedures and other corrective actions to reduce hazards to an acceptable level.

C.3.12 TECHNICAL PUBLICATIONS.

C.3.12.1 Technical Manuals. The Contractor shall develop Tech Pub Data IAW with Technical Manual Contract Requirement TMCR provided in Attachment 0012 - LAV IETM TMCR, ATWS (CDRL A065 Technical Manuals). For development of the ATWS Technical Manuals, the Contractor shall use the current AT Technical Manual Data as a baseline. The manuals shall reference the commercial and military manuals associated with the specific equipment comprising the ATWS.

C.3.12.2 Corrections of Data and Deliverables. The Contractor shall deliver Tech Pub Data and PMR data thirty (30) days after each Logistics Review.

C.3.12.3 Reserved.

C.3.12.4 Computer Access. The Contractor shall have the capability to implement real-time changes to provisioning and technical manuals resulting from logistics reviews.

C.3.12.5 Modifications Instructions (MI). The Contractor shall develop and deliver an MI for the modernized LAV-AT. The MI shall detail the procedures and the tasks required to upgrade the present LAV-ATA2 with hydraulic drive M901 turret to an ATWS configured LAV-ATA2. The MI shall cover the upgrade in both a legacy and new production vehicle. The MI shall be delivered IAW CDRL A066 Modification Instructions. Prior to submitting CDRL A066, the Contractor will conduct a physical validation and verification (VAL/VER) of the MI with government participation. The Government requires thirty (30) days advance notification from the Contractor of the Contractor's physical VAL/VER. The Government will provide personnel to witness the Contractor's validation of this data. The Government may participate in the Contractors validation effort and if so this will constitute the Governments verification. This will reduce the schedule time and total Government and Contractor effort required at the Validation Reviews. The Contractor shall record and maintain daily records during the review(s). The Government will provide a legacy and new production LAV-ATA2 configuration vehicle for the validation effort. If the Government is not available for the Contractor's validation effort, proof of validation shall be provided to the Government. The Government will then perform a verification of the MI at the Contractor's site NLT ten (10) days after receipt of the MI.

C.3.12.6 Recommended Repair Parts List (RRPL). The Contractor shall deliver an updated Recommended Repair Parts List IAW CDRL A067 Recommended Repair Parts List no later than thirty (30) days prior to CDR. The list shall include part number or NSN, CAGE code, unit price, extended price, recommended buy quantity, SMR code, and follow the Contractors WBS. Listing shall support ATWS systems for the first two (2) years after initial production system installation. The list shall include parts, assemblies, and tools.

C.3.13 GENERAL PURPOSE SUPPORT EQUIPMENT. The contractor shall provide a listing of general purpose support equipment IAW CDRL A068 - Maintenance, Test and Support Equipment List which is defined as tools, test equipment, automatic test equipment, and Built-in test and built-in test equipment (BIT/BITE). Items currently in the Marine Corps inventory to the maximum extent practical shall satisfy the requirement for support equipment. Listings of support equipment resident in the Marine Corps inventory are available from the Government upon the contractors written request. If the contractor has determined that support equipment is not required, then an explanation is required on how and for how long the system is going to be maintained.

C.3.13.1 Special Purpose Support Equipment. The contractor shall provide a listing of Special Purpose Support Equipment (SPSE) IAW A068 - Maintenance, Test and Support Equipment List which are defined as tools, and test equipment NOT currently in the Marine Corps inventory. Listing of tools and test equipment resident in the Marine Corps inventory are available from the Government upon the contractors written request. If it has been determined that SPSE is required, the contractor shall develop a Support Equipment Recommendation Data (SERD) using MIL-PRF-49506 detailing the recommended test equipment and testing application.

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C.3.13.1.1 Calibration and Measurement Requirements Summary (OPTION). The contractor shall list calibration requirements of test equipment IAW CDRL A069 - Calibration and measurement Requirements Summary (CMRS). The Calibration and Measurement Requirements Summary (CMRS) shall be developed only for SERD, which have been identified by the Government.

C.3.13.2 Built-in test/Built-in test Equipment. The contractor shall provide a listing of Built-in test/built-in test equipment (BIT/BITE) IAW CDRL A053-TMDE Test Troubleshooting Procedures along with BIT/BITE Test Equipment List within the system. A CMRS shall be provided for each BIT/BITE. BIT is a test approach using BITE or self-test hardware and software that are internally designed into the supported system, subsystem, or equipment to test all or a part of that system, subsystem, or equipment. BITE is any device that is part of a system, subsystem, or equipment and is used for the express purpose of testing the system, subsystem or equipment. BITE is an identifiable unit of the system, subsystem or equipment.

C.3.13.3 General Purpose Automatic Test Equipment. The contractor shall provide a listing of required General Purpose Automatic Test Equipment (GPATE) as part of CDRL A068 - Maintenance, Test and Support Equipment List, which is defined as automatic test equipment currently in the Marine Corps inventory. A listing of GPATE of Marine Corps inventory is available from the Government upon the contractors written request.

C.3.13.4 Special Purpose Automatic Test Equipment. The contractor shall provide a listing of Special Purpose Automatic Test Equipment (SPATE) as part of CDRL A068 - Maintenance, Test and Support Equipment List, which is defined as automatic test equipment NOT currently in the Marine Corps inventory. Listing of automatic test equipment resident in the Marine Corps inventory is available from the Government upon the contractors written request. If it has been determined that SPATE is required, the contractor shall develop a Support Equipment Recommendation Data (SERD) using MIL-PRF-49506 detailing the recommended test equipment and testing application. Approval of SPATE must be received from the DoD Automatic Test Systems Management Board before any procurement is initiated. Assistance in obtaining this approval can be requested from PM TMDE. The SERD identifies and provides data relevant to each proposed support equipment item. Some of these data elements are used to validate the support equipment requirement; the balance provides logistics management data for inventory management control. The SERD contains a description of the support equipment requirements. It identifies the function and characteristics of the equipment, and any other requirements necessary to use or install the equipment. The SERD will identify the design data requirements and the estimated cost to the Government for that data. The SERD also details the ILS requirements for the equipment item, such as whether it requires maintenance, technical manuals, and other information for support of the item.

C.3.13.4.1 Calibration and Measurement Requirements Summary for SPATE. The contractor shall list calibration requirements of test equipment for SPATE IAW CDRL A069-Calibration and Measurement Requirements Summary (reference C.3.13.1.1). The Calibration and Measurement Requirements Summary (CMRS) shall be developed only for SERDS, which have been identified by the Government.

C.3.14 SOFTWARE. Software as mentioned in the following paragraphs is defined as the integration software that is used to interface between the MITAS, turret and the vehicle chassis and hull.

C.3.14.1 Software Engineering. The contractor shall define a software development IAW CDRL A071 - Software Development Plan approach appropriate for the computer software effort to be performed under this solicitation. This approach shall be documented in a Software Development Plan (SDP) IAW the framework established in IEEE/EIA 12207. The contractor shall follow this SDP for all computer software to be developed or maintained under this effort. The SDP shall define the Contractors proposed life cycle model and the processes used as a part of that model. In this context the term "life cycle model" is as defined in IEEE/EIA 12207. The SDP shall describe the overall life cycle and shall include primary, supporting, and organizational processes based upon the work content of this solicitation. In accordance with the framework defined in IEEE/EIA 12207, the SDP shall define the processes, the activities to be performed as a part of the processes, the tasks which support the activities, and the techniques and tools to be used to perform the tasks. Information provided must include specific standards, methods, tools, actions, strategies, and responsibilities associated with development and qualification. After the SDP CDRL has been submitted and approved, the Government will use the SDP for monitoring progress and providing indications of emerging risks and problems. As a formal CDRL, the SDP will be placed under configuration control, with all changes subject to Government approval. Final delivery of the SDP shall take place as soon after award as feasible, but no later than commencement of software activity. The SDP shall be reevaluated at least once every six months. This reevaluation shall be performed in accordance with the contractor's continuous process improvement defined within the SDP, and shall be conducted to ensure that the applied processes are effective and documented. The contractor shall propose a development sequence and schedule for all software related documents, with rationale explaining how the schedule was derived. The Government will use this schedule and sequence for developing its on-site planning schedule for Technical Interchange Meetings. Final versions of all documents will be developed within thirty (30) calendar days of the completion of the software FCA/PCA audits.

C.3.14.2 New Software. The Government does not anticipate that any new software will be required for the ATWS. A Government Off The Shelf (GOTS) and Commercial Off The Shelf (COTS) system maturity level of 6 or higher is required for the ATWS solution that will be selected. The need for new software is not considered desirable by the Government.

C.3.14.3 Software Allocation. The contractor shall categorize all software as application software and support software categories in the SDP. Each category shall comprise a Software Configuration Item (SCI) and may further be subdivided into Software Units. The contractor shall implement an electronic system of software development folders for centrally collecting all design and test information for each software unit developed.

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C.3.14.4 Software Technical Interchange Meeting. The intent of these meetings is to ensure that any software development under this contract is traceable and supportable. Additionally, this meeting should be the forum for establishing ground rules for the Government-Contractor software team regarding how they will interact. The document approval process should also be established at this time. The frequency and duration of these meetings will be mutually agreed to at the program Start of Work meetings. It is anticipated that the meetings be held on a monthly basis for the EMD phase but may be adjusted at the partnering meetings. These meetings may take the form of Government and/or Government representatives participating in regularly scheduled internal software design and management activities.

C.3.14.5 Software Reviews. The contractor shall conduct, for all application and support SCIs, a Software Specification Review. During design Reviews (PDR, CDR) and Test Reviews (TRR), all application and support SCIs shall be addressed.

C.3.14.6 Source Code and Executable Software. The contractor shall provide all applicable software source code and associated executable software developed in support of the ATWS IAW CDRL A072 Computer Software Product- LAV ATWS Source Code. All Non Developmental Items COTS or GOTS software shall be delivered with the appropriate licenses and without restrictions for usage in the intended vehicle application. The source code developed by the contractor shall be delivered separately from the vehicles.

C.3.14.7 Software IPT. Upon contract award, the contractor and the Government shall jointly establish a Software Integrated Process Team (IPT). This team shall consist of contractor and Government representatives. The contractor's Lead Software Engineer will chair the Software IPT. The Software IPT shall be tasked to define, document, monitor, and improve the software development approach being used for the software effort. Specifically, the Software IPT shall:

1. Define and document the software development approach to be used for the work effort. The approach is to be documented in the Contractors' SDP, which is to be based on the proposed SDP submitted with the Contractor's proposal.
2. Secure Government approval for the SDP. Approval is facilitated by having Government representatives serving on the Software IPT.
3. Identify and make process improvements to the software approach, and document these in the SDP. These improvements are to be based on lessons-learned, suggestions from staff, and industrial advancements, and other sources.
4. Control all changes to the SDP.
5. Monitor development progress, assess effectiveness of the development approach, and monitor adherence to the defined process.
6. Monitor industry-wide lessons-learned, evolution of standards, advances in relevant technology, tool utility and availability, and other information that may prove to be valuable for the software work effort.
7. Advise program management in areas relating to the software effort.

The Software IPT is not responsible for the management of the software effort, for performing software quality assurance, or for acting as an Independent Verification and Validation (IV&V) agent. The Software IPT however shall rely on existing program management and on the Quality Assurance (QA)/IV&V function to provide sufficient information to facilitate their monitoring of progress and adherence to plan.

C.3.14.8 Software Requirements Specification. The Contractor shall provide a Software Requirements Specification (SRS) IAW CDRL A073 Software Requirements Specifications. The SRS shall specify the requirements for the Software Configuration Item(s) (SCI) and the verification methods to be used to ensure that each requirement has been met.

C.3.14.9 Software Test Plan. The Contractor shall develop a Software Test Plan (STP) and submit the plan to the Government for review at PDR. Changes and upgrades to the STP shall be maintained and reviewed at CDR. The STP shall describe the plans for qualification testing of SCIs and software systems. It shall describe the software test environment to be used for the testing, the tests to be performed, and provide the schedules for test activities. The Contractor shall maintain a Software Test Plan covering testing required by this SOW for review, analysis, and concurrence by the Government. This document shall address any demonstration plans for software requirements as well as all informal and formal testing.

C.3.14.10 Software Test Report. The Contractor shall provide a Software Test Report (STR) IAW CDRL A074 - Software Test Report. The STR is a record of the qualification testing performed on an SCI, a software system or subsystem, or other software-related item.

C.3.14.11 Software Version Description. The Contractor shall provide a Software Version Description (SVD) IAW CDRL A075 - Software Version Description. The SVD shall identify and describe a software version consisting of one or more SCIs and shall be used to release, track, and control software versions.

C.3.14.12 System/Subsystem Specification. The Contractor shall provide a System/Subsystem Specification (SSS) IAW CDRL A076 - System/Subsystem Specification. The SSS shall specify the requirements for a system or subsystem and the verification methods to be used to ensure that each requirement has been met. The SSS shall be used as the basis for design and qualification testing of a system or subsystem.

C.3.14.13 Interface Requirements Specification (IRS). The Contractor shall provide an Interface Requirements Specification (IRS) IAW CDRL A077 Interface Requirements Specification (IRS). The IRS shall specify the requirements imposed on one or more systems, subsystems, Hardware Configuration Items (HWICIs), SCIs, manual operations, or other system components to achieve one or more interfaces among these

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entities.

C.3.14.14 Interface Design Description (IDD). The Contractor shall provide an Interface Design Description (IDD) IAW CDRL A078 Interface Design Description. The IDD shall describe the interface characteristics of one or more systems, subsystems, Hardware Configuration Items (HWICIs), SCIs, manual operations, or other system components.

C.3.14.15 Traceability. Traceability shall be identified and maintained from the system level requirements to the applicable test cases which demonstrate compliance with the requirement. Traceability shall be provided to and from the predecessor documents to include the Software Requirements Specification, Interface Requirements Specification, Software Design Document, and Software Test Description.

C.3.14.16 Software Testing Program. The Contractor shall establish, implement, and conduct a Software Testing Program, including Software Item (SI) integration testing and Software Unit (SU) testing in accordance with software testing practices outlined in IEEE/EIA 12207. In addition to complying with IEEE/EIA 12207, Testing shall be performed as follows:

1. The testing shall be performed as documented in the Software Test Description (STD). The STD shall identify the use of emulators or simulators and laboratory hardware as required.
2. The Contractor shall conduct a Software Testing in accordance with the Software Test Plan and the Software Test Description concurrently with DVT. The current version of the STD shall be utilized to describe any test scenario required in support of testing the SRS requirements. The software testing shall be performed against the requirements documented in the SRS.
3. Within fifteen (15) calendar days of the conclusion of the DVT, the Contractor shall finalize a Software Test Report in Contractor's format that is agreed upon by the Government. The report shall document the results for the impacted software.
4. The Contractor shall conduct a Regression Test within thirty (30) calendar days of the conclusion of the Software Test, in order to demonstrate all fixes to problems identified in the Software Test Report. A regression test analysis shall be accomplished to determine the appropriate degree of re-testing necessary to assure proper implementation of the change and that no resulting degradation of system performance has been introduced.

C.3.14.17 Software Audits. The Contractor shall support a Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA) to be conducted by the Government. The FCA will validate that the development of the software has been completed satisfactorily and has achieved the functional and allocated configuration identification. The PCA will verify that the software "as built" conforms to the technical documentation.

C.3.14.18 Software Quality Assurance (SQA). Software Quality Assurance shall be maintained throughout the systems life cycle. SQA procedures and practices shall be implemented to ensure that the operational integrity of the systems software is maintained. The SQA program shall be part of the management reporting system during all phases of the software development. Additionally, the SQA program shall utilize analyses and assessments, documentation reviews, design reviews, and shall monitor tests and audits to ensure compliance with the requirements.

C.3.14.19 Software Configuration Management (CM). Configuration Management shall maintain the Software Release Library containing the software source code and object files. Configuration Management shall also maintain the library of software documentation Government Software Partnering Team representatives will use this plan to aid in their understanding of the Contractor's configuration management techniques and methodology.

C.3.14.20 Software Independent Verification and Validation (IV&V). The Contractor shall provide access to all information necessary to analyze the software and firmware modifications as the development progresses. Access provided to the Government Representative shall include the following:

1. Access to the software maintenance library; all software, software reviews, meetings minutes, program listings, documentation (including design notebooks and Software Development Files (SDFs)).
2. Software Problem Correction Reports (PCRs) and Test Incident Reports (TIRs), configuration status accounting records and reports, and all internal reviews and audits.
3. The Contractor shall also provide access to all levels of testing, test results, raw test data, reduced test data, and observations written by the test conductor.

C.3.15 CONTRACTOR MANAGEMENT DATA.

C.3.15.1 Earned Value Based Performance Management System (EVBPMMS). The Contractor shall utilize its performance management system to plan, schedule, budget, monitor, manage, and report cost, schedule, and technical status applicable to the contract. The Contractor's performance management system serves as the single, formal, integrated system that meets both the Contractor's internal management requirements and the requirements of the Government for timely, reliable, and auditable performance information. The application of these concepts provides for early indication of contract cost, schedule, and technical challenges. The outputs of this system are used as the basis to report detailed performance status during program management reviews and other status meetings. The Contractor's system shall satisfy the Industry Guidelines delineated in the ANSI/EIA-748, DFARS Clause 252.234-7001/7002, the general provisions of the contract, and this Statement of Work. The Contractor may use a previously validated system but validation is not required for the purpose of this contract.

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C.3.15.2 Contract Work Breakdown Structure (CWBS). The Contractor shall develop and maintain the CWBS and CWBS Dictionary IAW CDRL A080 CWBS. The Contractor shall extend the CWBS down to the appropriate level required to provide adequate internal management, surveillance, and performance measurement. The Contractor shall use the CWBS as the primary framework for contract planning, budgeting, and reporting of the cost, schedule, and technical performance status to the Government. Changes to the CWBS or associated definitions, at any reporting level, require approval of the Government. The CWBS shall include and build upon the Work Breakdown Structure (WBS) provided as GFI, in Attachment 0014 Work Breakdown Structure.

C.3.15.3 Contract Funds Status Report. The Contractor shall provide a Contract Funds Status Report (CFSR) IAW CDRL A082 Contract Funds Status Report to the Government. The CFSR provides DoD Components with information to update and forecast contract funding requirements; to plan and decide on funding changes; to develop funding requirements and budget estimates in support of approved programs; and to determine funds in excess of contract needs and available for deobligation.

\*\*\* END OF NARRATIVE C0001 \*\*\*

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## SECTION E - INSPECTION AND ACCEPTANCE

## PHASE I Engineering and Manufacturing Development

E.1 INSPECTION AND ACCEPTANCE POINT: Origin.

E.1.1 The contractor shall conduct Procurement Quality Assurance Inspections to demonstrate the conformity of the LAV-AT Anti-Tank Weapon System (ATWS) and other deliverable components using the applicable inspection documents, drawings and specifications at the following locations:

Contractor's Plant: Raytheon Company, CAGE 96214  
Address: 2501 West University Drive, McKinney, TX 75071

Sub-contractor's Plant(s) MOOG Inc. CAGE 68J03  
Address: 7406 Hollister Ave, Goleta, CA 93117-3261

E.2 INSPECTION AND ACCEPTANCE POINT (DATA). The inspection and acceptance of any data delivered under this contract shall be at destination. Destination shall be as set forth in the SOW paragraph or CDRL associated with the data item.

E.3 QUALITY ASSURANCE REQUIREMENTS.

E.3.1 QUALITY ASSURANCE (QA) PROGRAM. The Contractor shall develop, implement, and maintain a QA Plan as applicable to their quality system model. This manual or plan shall be made available to the Government for review upon request. The Contractor's Quality Assurance Program shall be implemented within 120 days after contract award. This program shall comply with a commercial (ANSI/ASQC Q9001) or international (ISO 9001 standard or a standard accepted by the Government as equivalent). The documented QA Program shall be made available to the Government for review upon request. The contractor's plan for the quality management system shall address the following elements:

- 1 . Management Responsibility. Procedures to define, document, and implement a policy for quality.
- 2 . Quality System. Procedures to establish, document, and maintain a quality system, which includes a quality manual, system procedures, and quality planning.
- 3 . Contract Review. Procedures to establish and maintain documented procedures for contract review.
- 4 . Design Control. Procedures to establish and maintain documented procedures to control and verify design of the product to ensure conformance to specified requirements.
- 5 . Document and Data Control. Procedures to establish and maintain documented procedures to control all documents and data (including hard copy and electronic media) including such documents as standards and Government drawings.
- 6 . Purchasing. Procedures to establish and maintain documented procedures to ensure that purchased product, associated documents and data conform to requirements. Sub-contractors are to be evaluated and selected on their ability to meet subcontract requirements and type and extent of control exercised by the supplier over subcontractors is to be defined.
- 7 . Control of Government-Supplied Product. Procedures to establish and maintain documented procedures for the control of verification, storage and maintenance of Government-supplied product provided for incorporation into the supplies or for related activities.
- 8 . Product Identification and Tractability. Where appropriate, procedures to establish and maintain documented procedures for identifying the product from receipt and during all stages of production, delivery, and installation.
- 9 . Process Control. Procedures to identify and plan the production, installation and servicing processes, which directly affect quality and to ensure these processes are carried out under controlled conditions.
- 10 . Inspection and Testing. Procedures to establish and maintain documented procedures for inspection and testing activities, in order to verify that the specified requirements for the product are met.
- 11 . Control of Inspection. Measuring and Test Equipment. Procedures to establish and maintain documented procedures to control, calibrate and maintain inspection, measuring and test equipment, (including test software) used by the supplier to demonstrate the conformance of product to the specified requirements.
- 12 . Inspection and Test Results. Procedures to ensure that the inspection and test status of the product are identified and maintained throughout the production, installation and servicing of the product. And, to ensure that only products that passed the required inspections and tests (or released under an authorized concession) are dispatched, used or installed.

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13 . Control of Non-Conforming Product. Procedures to establish and maintain documented procedures to ensure that product that does not conform to specified requirements is prevented from unintended use or installation.

14 . Corrective and Preventive Action. Procedures to establish and maintain documented procedures for implementing corrective action in the handling of Government complaints, product non-conformities, and the application of controls to ensure corrective action is taken and that it is effective. Preventive action procedures will detect, analyze, and eliminate potential causes of non-conformities.

15 . Handling, Storage, Packaging, Preservation and Delivery. Procedures to establish and maintain documented procedures to prevent damage or deterioration of product.

16 . Control of Quality Records. Procedures to establish and maintain documented procedures for identification, collection, indexing, access, filing, storage, maintenance and disposition of quality records. Quality records shall be maintained to demonstrate conformance to specified requirements and the effective operation of the quality system.

17 . Internal Quality Audits. Procedures to establish and maintain documented procedures for planning and implementing internal quality audits to verify whether quality activities and related results comply with planned arrangements and to determine the effectiveness of the quality system.

18 . Training. Procedures to establish and maintain documented procedures for identifying training needs and provide for the training of all personnel performing activities affecting quality. Appropriate records of training shall be maintained.

19 . Servicing. Where servicing is a specified requirement, to establish and maintain documented procedures for performing, verifying and reporting that the servicing meets the specified requirements.

20 . Statistical Techniques. The supplier shall identify what statistical techniques are to be used for computing, documenting, verifying, and controlling both the contractors process capability and the suppliers product characteristics. The supplier should also identify how they are to be implemented.

E.3.2 QUALITY SYSTEM AUDITS and INSPECTIONS. Operating procedures and inspection records that document the Contractor's adherence to its Quality System shall be made available for Government review when requested. The Contractor is subject to procedural audits, Functional Configuration Audits (FCA), Physical Configuration Audits (PCA) and product inspections at any point during the contract and shall provide audit and inspection assistance upon request. Audits and product inspections will be conducted by the Government to verify the Contractor's compliance to its quality program and compliance to its documented operating procedures.

E.3.2.1. The PCO, ACO or the Government QAR shall provide audit and inspection results to the Contractor. The Contractor shall respond to all unsatisfactory audit and inspection results within thirty (30) days from receipt of the Government Audit and Inspection report(s) and provide corrective action as required IAW CDRL A084 (Quality Systems Audits & Inspection Response Report). All deficiencies detected during any Government audit(s) or product inspections shall be corrected by the Contractor IAW its documented Quality Assurance Program.

E.4 QUALITY CONFORMANCE INSPECTION AND TEST PROCEDURES (QCI&TP). The Contractor shall develop QCI&TP for the inspection and acceptance of each ATWS developed under this contract. The QCI&TP shall be broken out into two parts. Part I shall address inspection and acceptance criteria for the ATWS at the Contractor's facility. Part II shall outline all the inspections and tests required to verify proper installation, integration and operation of the ATWS throughout the installation process. The QCI&TP shall include the inspection and test controls specified in the drawings, ATWS P-SPEC and any related data required for acceptance of the ATWS. The QCI&TP shall be prepared in Contractor format and submitted to the Government for review and approval IAW CDRL A017 - Quality Conformance Inspection and Test Procedures (QCI&TP).

E.4.1 NOTIFICATION OF CONTRACTOR TESTING AND INSPECTION. Prior to the commencement of any Contractor Qualification Testing (QT) or First Piece Inspection (FPI) scheduled to verify the performance of any hardware or software, the Contractor shall contact in advance through email, the LAV AT Modernization Team, Quality Assurance Specialist at usarmy.detroit.tacom.mbx.lav-atm-cdrles@mail.mil and the DCMA QAR. The Contractor shall provide notification at least fifteen (15) days prior to any QT or FPI events to be conducted in North America and seventy (70) days notification of testing in other countries outside of North America.

E.4.2 Upon Governments decision to monitor such testing and inspections, the Contractor will provide for Government participation in the selected FPI or QT in accordance with E. 4.1.

E.5 INSPECTION EQUIPMENT. The contractor shall be responsible to supply and maintain all inspection and test equipment necessary to assure the ATWS and components conform to contract requirements. All inspection equipment shall be available for use at the start of production. The contractor shall make available to the Government applicable and necessary inspection equipment upon request for use during Government inspections. The Government will return all inspection equipment upon completion of inspection.

E.6 DRAWINGS FOR INSPECTION. When requested, the contractor shall provide legible drawings, Engineering Change Orders/Engineering Change Requests (ECOs/ECRs), Requests for Deviations (RFD), printed specifications and Quality Assurance Provisions (QAPs) to which the ATWS was manufactured. These drawings and specifications shall be annotated to the latest revision. After the Government completes the

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product inspection and acceptance, the Government will return all drawings and specifications to the contractor.

E.7 SECTION 3 & 4 OF THE PERFORMANCE SPECIFICATION. Section 3 of the Performance Specification (Attachment 001) provides the performance and inspection and test requirements for the LAV-AT ATWS. Section 4 (inclusive), "Quality Assurance Provisions" constitutes quality assurance requirements along with those requirements set forth in this contract.

E.8 INSPECTION/TEST AND CONDITIONAL ACCEPTANCE OF PRODUCTION REPRESENTATIVE ANTI-TANK WEAPON SYSTEM (ATWS).

E.8.1 The Contractor shall develop two (2) ATWS and integrate these systems into the LAV-ATA2 chassis for DT and OT. The number of ATWS's to be integrated into the LAV-ATA2 chassis may increase to four (4) should EMD options (one each under CLINs 0002AB and 0002AC) be exercised. At least twenty (20) calendar days prior to the inspection and test of the first integrated ATWS, the contractor shall furnish written notice to the Procurement Contracting Officer or his/her representative, of the time and location of the inspections and tests so the Government may witness and participate in the inspection and test. At the time of inspection and test, the contractor's record of inspections, tests and certifications, previously conducted on the ATWS and components shall also be made available for review by the Government representative(s). All deficiencies detected by the Contractor or Government and any corrective action taken, shall be described in writing on the deficiency sheet attached to the QCI&TP. The contractor shall correct all deficiencies detected in the ATWS hardware, supporting equipment and documentation prior to providing the Production Representative ATWS to the Government for conditional acceptance. The Government will conditionally accept the Production Representative Model (PRM) ATWS once any identified deficiencies are corrected by the Contractor.

E.8.2 Two (2) conditionally accepted installed production representative ATWSs shall be delivered to a Government test site for DT.

E.9 FINAL INSPECTION AND ACCEPTANCE OF PRODUCTION REPRESENTATIVE MODELS (Destination).

E.9.1 Upon arrival of the two (2) LAV-ATA2 vehicles with installed production representative ATWSs at the test site, each vehicle shall undergo a complete inspection of the ATWS to verify proper installation, integration and operation IAW the requirements of the QCI & TP. All deficiencies shall be documented on the Deficiency Sheet attached to the QCI & TP and corrected by the contractor prior to the start of test. Should the EMD option CLINS 0002AB and 002AC be exercised, the LAV-ATA2 vehicle from CLIN 0002AB will be delivered with the two (2) above vehicles at the test site. The LAV-ATA2 from CLIN 0002AC will remain at the contractor's facility and shall undergo a complete inspection of the ATWS to verify proper installation, integration and operation IAW the requirements of the QCI & TP. All deficiencies shall be documented on the Deficiency Sheet attached to the QCI & TP and corrected by the contractor prior to the start of ILS development.

E.9.2 Final acceptance of the production representative ATWS will occur following successful completion of DT and OT. Successful completion of DT and OT is defined as follows: Successful completion of DT and OT occurs when the PCO or his representative notifies the Contractor in writing that all TIRs have been officially closed. Official closure to a TIR is when a final response to each outstanding TIR is submitted by the Contractor per the requirements of E.11.8.3 and the Government determines that all reported test deficiencies are resolved to ensure that corrective actions are in accordance with the requirements of the ATWS Performance Specifications for DT and OT testing per E.11.8.3.3 and E.11.8.3.4

E.10 INSPECTION RECORDS. Inspection records of the examinations and tests performed by the contractor shall be kept complete and available to the Government for a period of two years following completion of the contract.

E.11 LAV-ATA2 TEST AND EVALUATION REQUIREMENTS.

E.11.1 TESTING OF ATWS PRODUCTION REPRESENTATIVE MODELS. The Government will conduct testing on two (2) LAV-ATA2 vehicles with production representative ATWS's installed. Of the two (2) vehicles, one (1) will be new build configuration and one (1) legacy configuration. Should EMD options (CLIN 0002AB and/or CLIN 0002AC) be exercised, the LAV-ATA2 vehicle from CLIN 0002AB and CLIN 0002AC shall increase the number of assets to be tested to four (4) and its configuration shall be new build. These vehicles shall be subjected to RAM testing as specified by the ATWS turret P-Spec, Table II. All testing will be conducted at a Government test site(s) that will be determined through the Test Integrated Process Team (TIPT). Developmental Testing (DT) will last approximately fifteen (15) months (9 months should both CLINS 0002AB and 0002AC be exercised) and will consist of safety testing, performance and RAM testing. DT performance and RAM testing will consist of at least 2656 hours of ATWS operations as well as a number of RAM miles, which will be determined through the TIPT process. Operational Testing (OT) will follow DT after an approximate a four month inspection and refurbishment period. OT is expected to last approximately three (3) months and will be conducted by the Marine Corps Operational Test and Evaluation Agency (MCOTE). All testing shall be in accordance with the LAV-AT Modernization Program (LAV-ATM) Test and Evaluation Master Plan (TEMP), the LAV ATWS turret P-Spec, and a Government prepared test program plan. The RAM requirements specified by the contract for the ATWS shall be evaluated and scored by the Government per the ATWS turret Failure Definition Scoring Criteria (FDSC) in attachment 0006, where the attachment will be further refined through the TIPT process. The extent of testing may be reduced at the discretion of the Test Integrated Process Team (TIPT) or in the case of EMD option CLINS 0002AB and 0002AC being exercised.

E.11.2 FOLLOW-ON TEST & EVALUATION (FOT&E) OF ATWS. The Government may be required to conduct FOT&E upon completion of DT and OT after the implementation of any ATWS corrective actions as a result of DT and OT. FOT&E is expected to last approximately forty (45) calendar days and will be conducted at a Government test site(s) to be determined. The length of FOT&E may be extended at the discretion of the

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(TIPT).

E.11.3 TEST INTEGRATED PROCESS TEAM (TIPT). The Government will conduct TIPT meetings quarterly to update the Test Evaluation Master Plan, the Failure Definition and Scoring Criteria (FDSC), contractor testing, detailed test plans and the test schedules for DT and OT. The Contractor will be required to attend these meetings. The contractor will be notified by the Government of the date and location of each TIPT meeting. The duration of each meeting will not exceed three days and may take place at one of the following locations: TACOM, Warren, MI or Yuma Proving Grounds, AZ.

E.11.4 SCORING AND ASSESSMENT CONFERENCE. The Government will conduct four (4) Scoring Conferences throughout DT and OT to facilitate operational and hardware system assessments of test data. The Scoring & Assessment Conferences provide for consistent accounting of basic failures and operational (mission) failures, as well as for scheduled, unscheduled, and essential maintenance actions in order to evaluate RAM-related characteristics of the Light Armored Vehicle-Anti-Tank Modification Program. The Contractor is invited to attend each Scoring and Assessment Conference scheduled for DT as a non-voting member. Only the Director of Marine Corps Operational Test and Evaluation Activity (MCOTEA) can authorize the attendance of contractor observers for OT Scoring Conferences. The OT Scoring Conference Chairman will be responsible for controlling the participation of contractors. The duration of each conference will last approximately two days and the Government will notify the Contractor prior to the start of each conference of the date and location.

E.11.5 TEST INCIDENT REPORT (TIR) CLOSEOUT MEETINGS. The Government will conduct TIR closeout meetings within 120 days after conclusion of all DT and OT testing and reporting activities. The TIR closeout meeting will be held at PM-LAV and participants will include the Contractor, PM, LAV representatives and representatives from the Government Test Agencies. All open TIRs and FACARs will be discussed at this meeting to determine the status and action required to bring them to closure. Successful completion of DT and OT occurs when the PCO or his representative notifies the Contractor in writing that all TIRs have been officially closed. Official closure to a TIR is when a final response to each outstanding TIR is submitted by the Contractor per the requirements of E.11.8.3 and the Government determines that all reported test deficiencies are resolved to ensure that corrective actions are in accordance with the requirements of the ATWS P-Spec for DT and OT per E.11.8.3.3 and E.11.8.3.4.

E.11.6 CONTRACTOR TEST SUPPORT. Also refer to (C.3.8.10, C.3.8.12, C.3.8.14) entitled Contractor Test Support. The contractor shall provide an on-site Field Service Representative (FSR) for the first four weeks of testing (training time not included). After the initial four (4) weeks, on-call support shall be required for the duration of the Test period. On-call support is defined as provision of a point of contact (POC) telephone number and email address to answer questions during normal (test site) work scheduled hours. On-call support shall include phone calls, and if necessary, sending a FSR to the test site to resolve issues that cannot be resolved by phone. The FSR POC shall acknowledge receipt of a request for information within two (2) hours of receipt. If an FSR is required at the test site, he must arrive within twenty-four (24) hours of the acknowledgement of the request for information. The FSR shall advise and assist Government personnel with operation, maintenance and repair of the ATWS under test and any other equipment furnished under this contract. Interaction with the OT Team is at the discretion of the Government. Technical assistance shall also consist of observation and assisting in assessment of problems. The technical assistance shall also include preliminary investigation of test failures and the performance of on-site repair, as requested by the Government, as well as provide spare and repair parts as required at the test site.

E.11.7 TEST DEFICIENCIES DEFINITIONS.

E.11.7.1 A failure: Is defined as an event, or state, in which the test system or a component of the test system does not or would not perform as specified in the P-Spec.

E.11.7.2 A defect: Is defined as a nonconformance to a technical requirement. Defects are specified in the ATWS P-Spec. A defect is classified as critical, major or minor.

Critical - A characteristic in which a defect could cause hazardous or unsafe conditions for individuals using, maintaining, or depending on the product.

Major - A characteristic, other than critical, in which a defect could cause a complete failure, both physical and functional, or affect interchangeability.

Minor - A characteristic in which a defect is not likely to materially reduce the usability of the product.

E.11.7.3 IMPACT OF TEST FAILURES/DEFECTS. In the event of ATWS or component system test failures resulting from the integration of the ATWS turret, the Government reserves the right to retest the ATWS and vehicle systems upon correction of the defect(s) by the contractor. Corrective action must be to the complete extent and duration specified in the test program or to such lesser extent as the PCO shall consider appropriate in his sole discretion. The Government shall have the right to extend the specified test period due to contractor induced delays to the test program as a result of ATWS defects, retest of contractor's corrective action, or failure to adequately or timely furnish parts support. Extensions to the test period as a result of contractor induced delays and the cost to conduct a retest shall be at no additional cost to the Government. The Contractor shall bear all costs for test delays and retest that are its responsibility and shall reimburse the Government for its additional costs attributable to such Contractor induced delays in the conduct of the tests. The Contractor is not responsible for test delays resulting from vehicle failures not attributable to the ATWS integration. If the test period must be extended as a result of vehicle induced delays, the Government will be responsible for any additional Contractor support required to support the extended period of testing.

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E.11.8 TEST INCIDENT REPORT (TIR)/FAILURE ANALYSIS & CORRECTIVE ACTION REPORT (FACAR).

E.11.8.1 PROCESSING TIRs AND FACARs. The Government will make available to the Contractor a copy of each TIR generated as a result of Government testing. TIRs will be provided to the Contractor electronically either by the PCO or the Contracting Officer Representative (COR) through the Army's VISION Data Library System (VDLS). Only TIRs affecting contractual compliance or performance will require a FACAR. The Government, within twenty (20) days after receipt of the TIR, will notify the Contractor electronically of those TIRs that will require a FACAR.

E.11.8.2 Upon receipt of the Government's request for failure analysis, the Contractor shall submit a FACAR through VDLS electronically, in contractor format along with a notification to PM-LAV that the FACAR response has been input. The time frames specified for Critical, Major and Minor TIRs in E.11.8.3 and E.11.8.3.1 shall apply for all TIR responses. The following information shall be required on the FACAR:

- a. TIR Number.
- b. Failure analyses report number.
- c. Response Date.
- d. Contract number.
- e. Equipment title.
- f. Serial number of affected equipment.
- g. Date of failure.
- h. Type of Test that failed.
- i. Effect on equipment.
- j. Total test time at failure.
- k. Failure analysis results.
- l. Statement as to whether this was a pattern failure.
- m. Corrective action to be taken.
- n. Measures to prevent future failures.

E.11.8.3 FACAR RESPONSES. The contractor shall provide FACARs electronically to PM-LAV (Ref. E.11.8.3.1) within the following specified timelines:

- Critical Test Incident - 48 hours after receipt of TIR.
- Major Test Incident - Within ten (10) days after receipt of TIR.
- Minor Test Incident Thirty (30) days after receipt of TIR.
- Info. Test Incident Thirty (30) days, if required.

E.11.8.3.1 INTERIM RESPONSE. If a final FACAR cannot be provided within the time frames specified in CDRL A049, the Contractor shall submit an interim response within the following timelines:

- Critical TIRs - 24 hours after receipt.
- Major TIRs - 3 days after receipt.
- Minor TIRs - 10 days after receipt.

An interim response shall state the current status of the contractor's investigation, the reason why a final response cannot be provided within the time frame specified, and a date when the final response will be provided. Requests by the Contractor to modify or extend the time period of the initial interim response must be reviewed and approved by the PCO or his authorized representative before another extension can be authorized.

E.11.8.3.2 FINAL RESPONSES. Final responses are required for all TIRs (Critical, Major and Minor), within the time frames specified in E.11.8.3 unless the Contractor, per E.11.8.3.1, has submitted an interim response, then final responses are required on the date provided on the interim response. The contractor shall indicate the recommended corrective action and status ("Final" or "Interim") on each FACAR. PM, LAV will evaluate each final FACAR and determine if it is acceptable to close, or if it should remain open pending further information or testing. The PCO or his representative shall notify the contractor if further information or action is required or if the TIR is closed.

E.11.8.3.3 CORRECTION OF DEFICIENCIES. The Contractor shall be responsible for the correction of all deficiencies (Hardware & Software) identified during Government Development Testing and Operational Testing (DT and OT). A deficiency is defined as a failure to achieve the requirements of the P-Spec. Correction of these deficiencies shall include: Preparation of a Class I Engineering Change Proposal (ECP) to incorporate the correction into the configuration of the affected ATWS or vehicle, in accordance with the requirements for ECP development in Section C.3.8.13 and C.3.8.15; and implementation into the product baseline at no cost to the Government.

E.11.8.3.4 Government approval of a Correction of Deficiency (COD) ECP does not relieve the contractor of the responsibility for meeting the requirements of this contract. The Government retains the right to retest the Contractor's correction or ECP to verify that it corrects the deficiency. If it is determined through testing that the system is still deficient, the Contractor will be required to

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correct the deficiency in accordance with the requirements of this provision. The Contractor's COD responsibility is not fulfilled until all test deficiencies are resolved to ensure compliance with the requirements of the Performance Specification (Attachment 0001).

**E.12 REFURBISHMENT OF DT AND OT ATWS TURRETS.**

E.12.1 The Contractor shall refurbish each ATWS used for DT and OT to the production configuration when directed by the Government, at a cost to be negotiated. Production configuration is when the ATWS meets all the criteria for "Condition Code A" as defined in the ATWS Technical Manual and has had all the production upgrades incorporated as delineated in the production TDP. Upon release by the Government from use in DT/OT and Validation and Verification test, each installed ATWS shall be delivered to the Contractor for evaluation to determine its condition and the effort required to restore it to a Condition Code "A" production configuration. Upon successful completion of this evaluation the contractor shall submit a Refurbishment Report to the Government in accordance with CDRL A083 (ATWS Refurbishment Report) for Government review and approval. The Refurbishment Report shall be in Contractor format and shall include a detailed list of required corrective actions and upgrades along with a cost estimate for the refurbishment of each ATWS. If refurbishment authorized by supplemental agreement, the ATWS shall be refurbished.

E.12.2 During the contractor's evaluation and refurbishment period of the ATWS, the Government reserves the right to witness any or all of the Contractor's inspection and refurbishment efforts.

E.12.3 If refurbishment is authorized, the Contractor upon completion of refurbishment shall notify the Government ten (10) days prior to final inspection and perform this inspection IAW the requirements of the ATWS, Quality Conformance Inspection and Test Procedures (QCI & TP). The Government shall witness this inspection to verify ATWS performance and that all required repairs and modifications were accomplished. All ATWSs that have been satisfactorily refurbished shall be shipped as part of the production quantity in accordance with the procedures set forth in Section F for the shipment of production ATWS Turrets.

E.12.4 GOVERNMENT FURNISHED EQUIPMENT (GFE)/GOVERNMENT FURNISHED MATERIAL (GFM). During the course of this contract, the Contractor shall be supplied GFE/GFM. The Contractor shall inspect such GFE/GFM upon receipt to determine its adequate count and condition. All deficiencies discovered during this inspection shall be documented on a Quality Deficiency Report (SF form 368) and submitted to PCO and the DCMA QAR, by electronic media, within fifteen (15) days from time of inspection (ref. C.3.2). Handling of GFE/GFM shall be in accordance with the Contractor's Quality Program (Section E.3.1). The Government will be responsible for quality deficient GFE/GFM received.

**PHASE II - PRODUCTION OPTION**

**E.13 QUALITY ASSURANCE PLAN UPDATE PHASE II.** If the production option is exercised, the Contractor shall update their QA Program Manual or Plan. The Contractor's updated Quality Assurance Program shall be implemented within sixty (60) days after Phase II option is exercised. Reference section E.3.

**E.13.1 ATWS INSPECTION AND ACCEPTANCE POINT (ORIGIN):**

RAYTHEON COMPANY, 2501 WEST UNIVERSITY DRIVE, MCKINNEY TEXAS 75071.

**E.13.2 INSPECTION AND ACCEPTANCE POINT (ATWS INSTALLATION) (DESTINATION):**

RAYTHEON COMPANY, 2501 WEST UNIVERSITY DRIVE, MCKINNEY TEXAS 75071.

E.13.3 INSPECTION AND ACCEPTANCE POINT (Data). The inspection and acceptance of any data delivered under this contract shall be at destination. Destination shall be as set forth in the SOW paragraph or CDRL associated with the data item.

E.13.4 QUALITY SYSTEM AUDITS/INSPECTIONS. Reference section E.3.

E.13.5 INSPECTION EQUIPMENT. Reference paragraph E.5.

E.13.6 DRAWINGS FOR INSPECTION. Reference paragraph E.6.

E.13.7 SECTION 3 & 4 OF THE PERFORMANCE SPECIFICATION (P-Spec). Section 3 of the P-Spec (Attachment 01) provides the performance characteristics and test requirements for the LAV-ATA2 ATWS. Section 4 (inclusive), "Quality Assurance and Test Provisions" constitutes quality assurance requirements tests along with those requirements set forth in this contract.

E.13.8 IN-PROCESS INSPECTION. The Government reserves the right to inspect end items or any parts and components during all manufacturing processes and reject such material that does not conform to either Government or contractor drawing and specifications. Such inspections by the Government may be performed at the contractor's predetermined inspection stations. All deficiencies detected during any contractor or Government inspection (end item or in-process) shall be corrected by the contractor at no cost to the Government. During any Government inspection, the contractor shall provide assistance upon request.

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E.13.9 INSPECTION OF PRODUCTION ATWS. The Contractor shall conduct a complete inventory and final inspection of each ATWS prior to delivery. The final inspection shall be conducted utilizing the Contractor prepared QCI & TP (Part I) delineated in Section E.4. Deficiencies detected during this inspection by the Contractor or Government shall be described in writing on the deficiency sheet attached to the QCI & TP and shall be corrected by the Contractor prior to conditional acceptance by the Government. If a trend of quality or workmanship deficiencies becomes apparent the Government has the right to stop acceptance of ATWS, or the installation of ATWS in the remaining fleet of vehicles, until the contractor corrects all the reported deficiencies.

E.13.10 CHANGE OF SUPPLIERS. If the Contractor changes sources of supply for any components or material that affects provisioned items, technical publications, or certifications, the Product Manager (PM-LAV) shall be notified. The Government reserves the right to require the Contractor to conduct another component level First Article Test. If required, this testing shall be successfully accomplished at contractor's expense prior to acceptance of any item containing the component furnished by the different supplier.

E.13.11 PRODUCT QUALITY DEFICIENCY REPORTS (CONTRACTOR SUPPLIED ITEMS).

E.13.11.1 The Contractor shall investigate, conduct failure analysis, and provide a corrective action response to all Product Quality Deficiency Reports (PQDRs - SF 368) generated by the user. PQDR investigations and failure analysis responses shall be limited to only the ATWS components and LAV-ATA2 items and components that fail as a result of the ATWS or the integration process under this contract. The Contractor shall conduct PQDR investigations for a period of two years after the last ATWS is shipped to the Customer. All PQDRs will be submitted for response through the PCO or his authorized representative. The Contractor shall notify the Government within five (5) days after receipt of each PQDR if an exhibit is required for failure analysis. The exhibit request shall include detailed instructions as to where the exhibit is to be sent along with a point of contact. Upon completion of the Contractor's investigation, a PQDR investigation report shall be prepared and provided (in contractor format), outlining the results of the investigation, summary of any failure analysis performed, and proposed corrective action to PM, LAV, IAW CDRL A018. All PQDR corrective action responses shall be provided to the Government within the following time frames:

a. Category I Twenty (20) days without exhibit or twenty (20) days after receipt of requested exhibit. A Category I Deficiency is defined as a product quality deficiency which may cause death, injury, or severe occupational illness; would cause loss of or major damage to a weapon system; directly restricts the combat readiness capabilities of a using organization; or which would result in a production line stoppage.

b. Category II Thirty (30) days without exhibit or thirty (30) days after receipt of requested exhibit. A Category II Deficiency is defined as a product quality deficiency which does not meet the criteria set forth for Category I.

E.13.11.2. In the event that more time is required to complete a PQDR investigation, the Contractor may request from the PCO or his authorized representative that an extension be granted. This request shall include a complete summary of the work performed to date, justification for the requested extension, and the date when the final response will be provided.

E.14 FIRST ARTICLE TEST REQUIREMENTS.

E.14.1 First Article Approval - Government Testing. The clause titled, "First Article Approval- Government Testing, FAR Part 52.209-4 is applicable to this contract. The First Article requirements (if the production option is exercised) is a First Production ATWS Turret Inspection (FPITI) and a Product Verification Test (PVT).

E.14.1.1 The Government may "Conditionally Accept" production ATWSs prior to satisfactory completion of the first article requirement in order to meet the ATWS delivery schedule. The contractor shall be responsible for correction of all defects on ATWSs that were conditionally accepted by the Government prior to satisfactory completion of the first article requirement regardless of the conditionally accepted ATWS geographical location. Final acceptance by the Government of such conditionally accepted ATWSs shall be made after satisfactory completion of all first article requirements and after all defects on the conditionally accepted ATWSs are corrected to the satisfaction of the Government.

E.14.1.2 In the event that during the course of the contract, the place of manufacture of end item(s) changes geographical location, the Government may elect to have the contractor repeat all or portions of the first article requirements.

E.14.1.3 Component First Article Testing: First Article Tests shall be required on the MITAS to assure compliance to its System Performance Specifications (SPS). The Government reserves the right to be present at any such testing. The Contractor shall notify the Government a minimum of twenty (20) days prior to conducting a test. Failure to notify the Government within the time limit may be grounds to reject the test.

E.15 FIRST PRODUCTION ATWS TURRET INSPECTION (FPITI).

E.15.1 Pursuant to the clause FAR 52.209-4 of this contract, the first production ATWS shall be subjected to inspections by the Contractor and Government. These inspections shall be in accordance with the provisions contained in this contract and as stated or

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referenced in the ATWS Performance Specification (Attachment 01). At least twenty (20) calendar days prior to submission of the FPTI for final inspection, the Contractor shall furnish written notice to the PCO of the time and location of the inspection, so that Government representatives may witness and participate in the inspection(s). The contractor shall make available to the Government any records of inspection and tests that have previously been conducted on the ATWS and their components.

E.15.2 FPTI REPORT. An FPTI report shall be prepared and submitted to Government, IAW CDRL A050 (First Production Turret (ATWS) Inspection Report). The test report shall be prepared in Contractor format and shall identify all tests and inspections conducted and report all deficiencies detected. The report shall specify the corrective action taken for each reported deficiency and the action taken to preclude this discrepancy from being repeated on follow-on ATWS production.

E.15.3 FPTI CONDITIONAL APPROVAL. The PCO shall, by written notice within twenty (20) calendar days after receipt of the FPTI report, conditionally approve or disapprove the FPTI turret. The notice of approval or disapproval will not relieve the contractor from complying with all requirements of the ATWS P-Spec and all other terms and conditions of this contract. A notice of conditional approval shall cite any further action required of the Contractor for the applicable first production ATWS. A notice of non-acceptance shall explain the reasons for the non-acceptance.

E.15.4 FPTI RE-INSPECTION. If FPTI is disapproved by the Government, the Contractor shall make any necessary changes, modifications, or repairs to the first production ATWS. Once the Contractor has taken corrective action, the Government has the right to repeat any or all of the first production ATWS inspections. The Government shall have the option to select another production turret to repeat any or all of the first production ATWS inspections in lieu of the original first production ATWS. Upon completion of any repeat inspection(s), the contractor shall again submit an inspection report IAW CDRL A050. The contractor shall bear the responsibility for delays resulting from additional first production ATWS inspection(s). The Contractor's failure to complete FPTI in a timely manner shall constitute failure to make delivery within the meaning of the "Default" article of the contract and subparagraph (d) of FAR 52.209 "First Article Approval - Government Testing.

E.15.5 FPTI STANDARD. After successful completion of FPTI, the First Production ATWS shall be retained as the manufacturing standard until completion of the production run and submitted as the last unit to be delivered under the contract. All configuration changes as a result of drawing and specification modifications taking place after the FPTI shall be made to the First Production ATWS so it will be representative of the current configuration throughout the life of the contract.

E.16 PRODUCTION VERIFICATION TESTING (PVT).

E.16.1 After successful completion of FPTI and pursuant to the clause entitled, "First Article Approval Government Testing" and Section E.16 of this contract, two (2) ATWSs shall be selected from the first four (4) produced and subjected to PVT as specified in Table I. PVT is performed by the Government to verify that the Contractor's production process is in accordance with quality assurance and manufacturing procedures and will not degrade the vehicle from its original performance characteristics as described in the ATWS P-Spec and LAV-A2 Purchase Description. PVT is expected to last approximately 100 working days and shall be conducted in accordance with the LAV-ATM Test and Evaluation Master Plan (TEMP), the ATWS P-Spec, the LAV-A2 Purchase Description, and a Government prepared test program plan. The RAM requirements specified by the contract for the ATWS shall be evaluated and scored by the Government per the ATWS Turret Failure Definition Scoring Criteria (FDSC), which will be developed through the Test Integrated Process Team (TIPT) process. The extent of testing may be reduced at the discretion of the TIPT. Final approval of the PVT shall not occur until testing has been completed and all test deficiencies are corrected to the satisfaction of the Government. A Government prepared test program plan will be provided to the Contractor for information purposes prior to the start of PVT.

TABLE I

Test Article	Quantity Test	Operating Hours
*ATWS Turret RAM	2	TBD Missions Static/Dynamic

\* Contractor ATWS installed in LAV-ATA2 Vehicles for testing.

PVT shall be conducted at the following Government Test Sites: Aberdeen Proving Grounds (APG)

E.16.2 PVT starts with the first day of performance or RAM testing. The test day count will be stopped only by a delay in repair parts replacement by the Contractor. Any delay over 48 hours shall be considered a test stoppage unless authorized by the Government. The Contractor shall not be charged for a test stoppage for delays in testing due to crew or maintenance error, gross negligence, or abuse. The test duration specified in E.16.1 is based on working days five (5) days per week.

E.16.3 The ATWS test vehicles shall be equipped with Government furnished test measurement instrumentation. Daily recordings shall be made throughout Government testing. Data obtained from this test instrumentation will be made available to the Contractor on an as required basis.

E.16.4 CORRECTION OF DEFICIENCIES - PHASE II. The Contractor shall be responsible for the correction of all deficiencies identified during Government First Article Testing at no cost to the Government. A deficiency is defined as a failure to meet the requirements of the ATWS P-Spec and LAV-A2 Purchase Description. Correction of these deficiencies shall include: Preparation of the ECP after Government

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approval, including:

Documentation changes or updates (ILS corrections, TDP updates and MIs) in accordance with the Configuration Management provisions in Section C;

- Acquisition, delivery, and installation of ECP retrofit onto all affected vehicles (either conditionally accepted or "in-process" prior to acceptance).
- Revision of upgrade, either conditionally accepted or in-process, to reflect the configuration changes effected by the ECP.

E.16.4.1 Government approval of a Correction of Deficiencies (COD) ECP does not relieve the Contractor of the responsibility for meeting the requirements of this contract. The Government retains the right to retest the Contractor's correction and ECP change to verify that it corrects the deficiency. If it is determined that the system is still deficient, the Contractor will be required to correct the deficiency in accordance with the requirements of this provision. The Contractor's COD responsibility is not fulfilled until all test deficiencies are resolved to ensure compliance with the requirements of the ATWS P-Spec. and LAV-A2 Purchase Description.

E.16.5 CONTRACTOR TEST SUPPORT. All of the requirements of paragraph E.11.6 shall apply to Phase II.

E.16.5.1 During PVT testing the Contractor shall provide TIR and FACAR support IAW Section E.11.4, E.11.5, and E.11.8.

E.16.6 TEST DEFICIENCIES. All of the requirements of paragraph E.11.7 (inclusive) shall apply to Phase II with the exception of Correction of Deficiencies (COD). The COD requirements of paragraphs E.16.4 shall apply to Phase II.

E.16.7 TEST MEETINGS. The Government will conduct approximately four (4) Test Integrated Process Team meetings (TIPT) a year and four (4) Scoring and Assessment Conferences in support of the PVT. The duration of each meeting or conference will last approximately three days and the Government will notify the Contractor prior to the start of each conference of the date and location. All of the requirements of paragraph E.11.3 (inclusive) shall apply to PVT.

E.17 REFURBISHMENT OF PVT ATWS.

E.17.1 The Contractor shall refurbish each ATWS used for PVT to a Condition Code "A" status when directed by the Government, at a cost to be negotiated. Condition Code "A" is when the ATWS meets all the criteria for "Condition Code A" as defined in the ATWS Technical Manual. Upon successful completion of PVT, each ATWS shall be inspected by the Government to determine its condition. If refurbishment is required, the Government will enter into a supplemental agreement with the Contractor for ATWS refurbishment.

\*\*\* END OF NARRATIVE E0001 \*\*\*

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## SECTION J - LIST OF ATTACHMENTS

<u>List of</u> <u>Addenda</u>	<u>Title</u>	<u>Date</u>	<u>Number</u> <u>of Pages</u>	<u>Transmitted By</u>
Attachment 0004	GOVERNMENT FURNISHED PROPERTY (GFE/GFI)	13-FEB-2013	002	EMAIL
Attachment 0017	SAFETY SYSTEM PROGRAM LAV-AT	30-MAR-2011	005	EMAIL