ENGINEERING & LOGISTICS STATEMENT OF WORK FOR THE A/M32U-21 MAINTENANCE TRAILER

FINAL
SEPTEMBER 2010

Naval Air Systems Command
Naval Air Warfare Center, Aircraft Division
Research and Engineering Group
SE and ALRE Department
CSE/PSE DEV & ISE DIV
Aircraft & Armament Handling Branch, Code 4.8.6.9
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1.0 SCOPE

This Statement of Work (SOW) identifies the specific tasks to be performed by the contractor for the A/M32U-21 Maintenance Munitions Trailer. The trailer is used to support the A/E32K-3 and A/M32K-11 Munitions Assembly Stand for weapons build up, the A/E37T-35A Common Rack and Launcher Test Set and A/N/GYQ-79 Common Munitions BIT Reprogramming Equipment as part of the ground support equipment for the USMC expeditionary airfields.

The A/M32U-21 Maintenance Trailer will be based on the A/M32K-10 Performance Specification, which is the baseline configuration for the A/M32U-21 Maintenance Trailer platform. The A/M32U-21 Maintenance Trailer will meet all requirements of the A/M32K-10 Performance Specification except as stated in A/M32U-21 Performance Specification which contains revisions to modify the A/M32K-10 Munitions Trailer to an A/M32U-21 Maintenance Trailer.

1.1 Program Objective. The program objective is to provide the US Marine Corp with a high capacity, low maintenance shorebased rough terrain maintenance trailer.

2.0 APPLICABLE DOCUMENTS

The following documents indicated below form a part of this statement of work to the extent specified herein. In the event of a conflict between the documents referenced herein and the contents of this document, the contents of this document shall be considered a superseding requirement with the exception of the Performance Specification.

2.1 Government Documents.

DI-ALSS-81529	Logistics Management Information (LMI) Data Product(s)
MIL-STD-100	Engineering Drawing Practices
MIL-STD-130M	Department Of Defense Standard Practice Identification Marking of U.S. Military Property
MIL-PRF-29612	Training Data Products
MIL-PRF-49506	Logistics Management Information
MIL-T-31000	Technical Data Packages
NAEC 09-4	Drawing Practices Manual
NAVAIRINST 4355.19D	Systems Engineering Technical Review Process
NAWCADLKE-PS-4869-06-001	Performance Requirements for the A/M32K-10 Maintenance Trailer

NACWCALKE-09-PR-4896-001	Performance Requirements for the A/M32U-21 Maintenance Trailer
NAVEDTRA130A	Task Based Curriculum Development Manual
TMCR No. 08-022	Technical Manual Contract Requirement for A/M32U-21 Maintenance Trailer

2.2 Commercial Standards.

NAS 411	Hazardous Materials Management Program (Rev. 2)
ANSI/ASME Y14.5M	Geometric Dimensioning and Tolerancing
ANSI Y14.24M	Types and Applications of Engineering Drawings
ANSI Y14.26M (1989)	American National Standard Digital Representation for Communication of Product Definition Data (IGES version 4.0)
ANSI/ASQC-Q9002	Quality Systems- Model for Quality Assurance in Production, Installation, and Servicing
ANSI/AWS A2.4	Standard Symbols for Welding, Brazing and Nondestructive Examination
SAE JA1011	Evaluation Criteria for Reliability-Centered Maintenance Processes
SAE JA1012	Guide to the Reliability-Centered Maintenance Standard

3.0 REQUIREMENTS

3.1 General. The work required by this contract shall be performed in accordance with this SOW to develop the technical data package, build pilot-production and production A/M32U-21 Maintenance Trailers, hereafter referred as the trailer, which meets the requirements of Performance Requirement NAWCADLKE-09-PR-4869-001. This document also defines the Integrated Logistics Support (ILS) requirements and services to be furnished for the end item production of the trailer.

3.1.1 Changes. This document is contractually enforceable. Additions, deletions or changes to this document shall be effective only after they have been jointly negotiated by the contractor and the Government and implemented on the contract through appropriate written contract modifications issued by the Procuring Contracting Officer (PCO).

3.1.2 Duplication of Data. Data already developed or being developed by other Department of Defense services or for other requirements shall be used to the maximum extent possible in satisfying requirements of this SOW. To the extent authorized by the Government, existing source data, documentation, reports and other data having application to this program shall be utilized to avoid duplication of effort.

3.2 PRODUCTION

3.2.1 Pilot-Production. The contractor shall produce two pilot-production trailers that meet the requirements stated in Performance Requirement NAWCADLKE-09-PR-4869-001 for inspection, evaluation and testing. The pilot-production A/M32U-21 shall be available for inspection and subsequent testing within 180 days after contract award. One pilot-production unit tested and accepted by the government shall remain at the contractor's plant until the end of the contract production to be used as manufacturing standard for the corresponding production items. The approved pilot-production unit shall be tendered for delivery with the last shipment under this contract. The contractor shall refurbish the pilot production units to the production configuration as necessary to place it in ready for issue (RFI) condition.

3.2.1.1 GFM Modification. The contractor shall modify air compressor P185WJDU, generators MEP-803A and MEP-813A as specified in NAWCADLKE-09-PR-4869-001.

3.2.2 Production Deliveries. The contractor shall deliver trailers at a rate of 1 per month commencing within 180 days after Government release for production.

3.2.2.1 Production Readiness Review. The Contractor shall host a Production Readiness Review (PRR) at their facility after completion of all testing and the Physical Configuration Audit (PCA)(CDRL B029 and B030). The Contractor and the Government shall collaborate in preparing and conducting the PRR in accordance with the guidance of NAVAIRINST 4355.19D.

3.2.2.2 Release for Production. The contractor will be notified by the Government of release for production only after: Contractor Pilot-production Test Report approval and Government receipt of Production Set drawing package (B017).

3.3 MANAGEMENT

The Contractor shall define how all aspects of the A/M32U-21 Maintenance Trailer program will be managed and controlled using the following documents:

Integrated Master Schedule. (CDRL A001)
Progress Reporting. (CDRL A002)
Configuration Management Plan. (CDRL A003)
Management Plan. (CDRL A004)

3.3.1 Communications. The Contractor shall establish a procedure to report the status of key events, problems and achieved milestones as they occur rather than rely solely on the various scheduled periodic reviews.

3.3.2 Post Award Conference. A Post Award Conference shall be held no later than 30 days after contract award to provide a common understanding of all contract requirements.

3.3.3 Program Management Review. The Contractor shall present a Program Management Review (PMR) to the Government program manager and team. The first PMR shall be with the post award guidance conference (see 3.3.2). The second PMR shall be with the Critical Design Review (CDR) (3.4.1.2). Additional reviews may be requested by the Government. All PMRs shall be at the Contractor's facility and shall provide the Government with an accurate summary of the Contractor's technical progress, program planning and overall management approach and progress. Topics to be addressed at the PMRs shall include:

1. Contract status, progress tracking and reporting of milestones
2. Problem and risk identification, assessment, reduction and control
3. Streamlining recommendations
4. Technical review
5. Cost performance
6. Subcontract management
7. Action items completed, pending and forecasted

Agendas for the PMRs shall be developed by the Contractor (CDRL A005). Minutes and Action Items will be agreed to at the conclusion of each PMR and distributed by the Contractor to the entire team (CDRL A006). The presentation developed by the Contractor for the PMRs shall be provided to the Government program manager five working days prior to the review.

3.4 DESIGN

3.4.1 Design Reviews. At minimum the contractor shall conduct the Preliminary Design Review (PDR) and CDR as defined in the following sub paragraphs. Additional informal design reviews should be held as significant design progress warrants.

3.4.1.1 Preliminary Design Review. The Contractor shall host a PDR at their facility within 30 days after contract award. The Contractor shall present the design progress of the A/M32U-21 to date and provide the results of the design analyses conducted in accordance with paragraph 3.4.3 through 3.4.3.2 (CDRL B001 and B002). The Contractor and the Government shall collaborate in preparing and conducting the PDR in accordance with the guidance of NAVAIRINST 4355.19D.

3.4.1.2 Critical Design Review. The Contractor shall host a CDR at their facility within 75 days after contract award. The Contractor shall provide any additional design analyses performed but not yet submitted, Initial Set (IS) drawings as defined in 3.7.3.1 and any recommended design changes along with justifications, trade-off studies and impacts of those changes (CDRL

B003 and B004). The Contractor and the Government shall collaborate in preparing and conducting the CDR in accordance with the guidance of NAVAIRINST 4355.19D.

3.4.2 Design Criteria.
The contractor shall design an A/M32U-21 Maintenance Trailer that meets the requirements of Performance Requirement NAWCADLKE-09-PR-4869-001 using the A/M32K-10 Rough Terrain Munitions Trailer, Performance Specification NAWCADLKE-PS-4869-06-001, as the baseline configuration for the trailer platform. All materials and components utilized shall be commercial-off-the shelf (COTS) or non-developmental items (NDI) to the greatest existent possible and meet the criteria of 3.4.2.1 through 3.4.2.4. Commercial components selected are to be readily supportable.

3.4.2.1 Sub-Systems. All major trailer platform sub-systems such as the Braking system, trailer Electrical system, Running gear, etc of the A/M32K-10 trailer shall be utilized for commonality. The generators shall be a modified MEP-803A & a modified MEP-813A. The air compressor shall be a modified P185WJDU Air Compressor.

3.4.2.2 Payload Item Placement. The contractor shall coordinate with Naval Air Warfare Center engineering personnel on payload item placements to ensure optimal deck layout. Any differences shall be resolved at PDR and CDR.

3.4.2.3 Reliability Design Criteria. Reliability of the A/M32U-21 and components shall be met through basic engineering considerations and reliability design techniques, shall minimize design complexity and parts counts, and shall not be degraded by manufacturing or production processes. The reliability of the A/M32U-21 and components shall be met without degradation of safety, performance, or static and dynamic load carrying capacity.

3.4.2.4 General Maintainability/Maintenance Design Criteria.
Maintainability design will focus on simplicity, accessibility, test points, component interchangeability and availability, use of common tools and support/maintenance equipment, maintenance safety, fault minimization, and low frequency of corrective (unscheduled) and preventive (scheduled/periodic) maintenance. Published generally-accepted maintainability design guidelines, to the extent applicable, will be used as guidance. Additional criteria for the design of the physical characteristics which influence maintainability features and maintenance requirements of the trailer, its, components, and interfaces, will be in accordance with applicable approved industry standards.

3.4.2.5 Accessibility. Accessibility, defined as a measure of the relative ease of admission to the various areas of a system or item for the purpose of operation or maintenance, will be maximized in the arrangement and packaging of the A/M32U-21, its components, and interfaces. The trailer, its components, and interfaces shall be designed for optimum accessibility compatible with operating, testing, maintenance, and enclosure requirements. All deck mounted payload items (generators, compressors, etc) shall be capable of full operations without having to remove or manipulate components of the A/M32U-21 Maintenance Trailer.

3.4.3 Design Analysis. The contractor shall provide engineering and technical services to perform the following analysis in 3.4.3.1 and 3.4.3.2. The analyses shall cross reference to the product drawings, including issue of revision level. In no case shall a specification or source controlled item, or their internal load path members be excepted from the analyses. Subsequent revision to any submitted drawing shall be accompanied by an amendment to the corresponding analysis, or confirmation that strength of the member is not affected by the revision. The format of the analyses shall be such that an independent reviewer will be provided with step by step calculations, design assumptions, and detail design data with sources identified and availability provided to the government, such that recourse to the original designer shall be minimized. Load, shear, and bending moment, torsion diagrams as appropriate shall accompany each individual part analysis.

3.4.3.1 Structural Analysis. An analytical evaluation of the basic structural competence; a load and stress analysis of the trailer shall include all load supporting and load directing members and power transmitting mechanisms and components. Structures, structural elements, and related attaching hardware/fasteners shall be designed to carry/support/transmit all required loads (including specified overloads), with adequate reliability margin-of-safety (stress-strength margin-of-safety) under all anticipated worst-case environmental and end-item operational conditions. The structural components of the trailer shall have a factor of safety of 3:1 to material yield strength under static loading conditions. Structural element failure modes to consider during design shall include, but not be limited to: static failure; brittle fracture; creep; corrosion; fatigue; wear; distortion; structural instability. The criteria for structural integrity is that yielding or permanent set shall not occur at the specified loading conditions multiplied by the appropriate factor of safety. For material with no definable yield point, or where a failure mode occurs before the onset of yielding such as column buckling, design shall be based on the ultimate strength or failure load. Material strength properties shall be those given in applicable MIL, AMS or other specifications. The analysis shall also include dynamic loading due to vibration for vibration susceptible components to demonstrate proper mounting and/or isolation (CDRL B005). Design changes incorporated after the submission of CDRL B005 shall require a resubmission of the analytical evaluation of the trailer in accordance with the requirements of 3.4.3.

3.4.3.2 Fatigue Analysis. A fatigue analysis of critical components subject to cyclic loading to ensure that the specification requirements for service life will be met. Material endurance limits shall account for effects such as, but not limited to, size effect, surface finish, notches, and heat treatment. S-N curves or constant life fatigue data for the applicable materials shall be used to drive fatigue life expectancy. Stress concentration factors, S-N curves, or constant life fatigue data used shall be obtained from documented research data or government publications. To prevent premature failure caused by repeated loads, the design and manufacturing methods of all parts and the techniques by which they are assembled and installed shall be such that applied or residual tensile stresses and stress concentrations are minimized. (CDRL B006)

3.5 SYSTEMS ENGINEERING

3.5.1 Definitions

3.5.1.1 Product Configuration Identification. The current approved technical documentation for a Configuration Item (CI) as set forth in specifications, drawings, and associated lists and documents referenced therein.

3.5.1.2 Physical Configuration Audit (PCA). A technical audit, consisting of a direct comparison of the characteristics of a sample item from the production lot with the characteristics specified on the applicable Product Configuration Identification (drawings, associated lists, specifications, etc.), to establish validity of the Product Configuration Identification. The PCA also verifies the component acceptance tests procedures on the drawings by direct comparison of the acceptance test methods and the test data, with the specified performance requirements. The technical data package, after being audited, will be part of the basic documentation for acceptance of configuration items during production, subject to approval of the drawings as applicable in the respective statement of work.

3.5.2 Physical Configuration Audit. The PCA shall be conducted at the prime Contractor, Vendor, or Subcontractor plants using parts which are to be used to assemble the trailer from the first production lot. The PCA may be accomplished on a completed item or incrementally as components are produced. It shall be conducted using the technical documentation prepared by the Contractor (and provided by the Government if any) that defines the Configuration Item(s) produced. It shall be verification by direct comparison of the technical documentation to the parts illustrated therein and obtained from the first production lot. Vendor and sub Contractor parts shall be included in the PCA, and shall be identified by the drawing part number. Where possible, Vendor and Subcontractor objective quality evidence such as functional performance tests may be used if verified by Government at source (catalog data shall not suffice). The PCA applies to all parts and technical documentation which comprise the trailer platform. It will result in an end product of revised, approved MIL-T-31000 drawings which comprise the product baseline for the contract. The revised product baseline will be furnished to the Contractor and Quality Assurance Representative (QAR) for use in production, procurement, inspection and acceptance in accordance with contract schedules cited elsewhere. The implementation of this revised product baseline shall be at no additional cost to the Government except as identified in the individual Government approved engineering changes. The drawings to be used shall be the initial set (IS), which describe the unit and accessories produced. Each drawing shall be annotated to indicate noncompliance, in addition to the results of the measurements and inspections made by the contractor. Once all differences between the drawings and the produced items are resolved the appropriate corrections shall be incorporated into the Production Submittal (PS). PCA shall be completed within 45 days prior to release for production.

3.5.2.1 Physical Configuration Audit Plan. The contractor shall prepare and submit a PCA plan in accordance with CDRL B007.

3.5.2.2 Physical Configuration Audit Report. The contractor shall prepare and submit a PCA report in accordance with CDRL B008.

3.5.2.3 General Procedures. The examination and verification shall be nondestructive. Vendor and Subcontractor furnished parts shall be verified in the delivered configurations. When examination and verification in the delivered configuration is impractical, or disassembly is destructive or not cost effective, the Contractor shall have the option of performing the PCA at the Vendor's or Subcontractor's plants, subject to adjoining verification by the government.

3.5.3 Configuration Control. The contractor shall submit Class I and Class II Engineering Change Proposals (ECPs), and all minor, major, and critical Requests for Deviation/Waiver (CDRLs B009, B010 and B011). Upon final delivery of the Technical Data Package, the procuring activity will assume configuration control of the maintenance trailer.

3.5.4 Hazardous Materials Management

3.5.4 .1 Hazardous Materials Management Program Plan

The Contractor shall prepare a HMMP Plan. The plan will be used to evaluate the Contractor's approach to, understanding of, and execution of a HMMP. The Contractor may satisfy this requirement with the submission of a plant-wide HMMP or similar previously prepared plan with any additional information added as an addendum. (CDRL A007)

3.5.4.2 Hazardous Materials Management Program Report

The Contractor shall ensure that all vendors and suppliers including those of sub-contractors provide all information to accurately and fully complete the HMMP requirements. A HMMP Report will be prepared by the contractor in accordance with CDRL A008. The report shall contain a well defined table that identifies and lists all HAZMAT as defined in the System Specification. As a minimum the following information is required.

a) HAZMAT nomenclature/name
b) Technical documentation and/or specification that require the use of the HAZMAT, if applicable
c) Name and Part Number of the component/part that contains the HAZMAT or is associated with the use/generation of the HAZMAT
d) Process associated with the use or generation of the HAZMAT.
e) Material Safety Data Sheets (MSDS) for each HAZMAT.
f) Chemical name(s) of hazardous component(s). (Sometimes found on MSDS).
g) Chemical Abstract Service (CAS) number(s) of each hazardous component(s).
h) Waste and disposal codes/regulations for the HAZMAT when appropriate.
i) Source of HAZMAT (prime Contractor, subcontractor, material supplier)
j) Weight of HAZMAT (as Parts Per Million (PPM) or per (SYSTEM NAME) as appropriate using best engineering judgment)

The Contractor shall maintain and update this report throughout the life of the contract. The table shall be dated and each addition/deletion or change

shall be annotated to denote change and date. Documentation justifying use of Restricted Chemicals shall also be included in the report.

3.5.4.3 Lithium Batteries

The use of lithium batteries as a part of the trailer system shall be documented in accordance with NAVSEA S9310-AQ-SAF-010, "Technical Manual for Batteries, Navy Lithium Safety Program Responsibilities and Procedures."

3.5.5 Quality Assurance Program. The contractor shall establish and maintain a quality system that adheres to the requirement of ANSI/ASQC-Q9002 or equivalent and all FAR clauses within the contract.

3.5.5.1 Responsibility For Inspection. The contractor is responsible for the performance of all inspection requirements. The contractor may use his own or any other facilities acceptable to the Government and suitable for the performance of the inspection specified. The Government reserves the right to perform or witness any or all of the inspections.

3.6 TEST

The Contractor shall establish, plan, maintain, conduct and support a test program to determine that the pilot-production trailer meets the requirements stated in Performance Requirement NAWCADLKE-09-PR-4869-001. The Contractor shall provide documentation on failures, their cause and the recommended corrective action. The Failure Reporting Analysis and Corrective Action System (FRACAS) shall be implemented for the duration of the pilot-production test program (CDRL B014 and B015).

3.6.1 Test Readiness Review (TRR). Prior to the start of Pilot-production testing the contractor shall host a TRR at their facility within 15 days prior to the start of testing (CDRL B018 and B019). The Contractor and the Government shall collaborate in preparing and conducting the TRR in accordance with the guidance of NAVAIRINST 4355.19D.

3.6.2 Pilot-Production Testing. Pilot-production testing shall be in accordance with Performance Requirement NAWCADLKE-09-PR-4869-001 and Performance Specification NAWCADLKE-PS-4869-06-001.

3.6.2.1 Pilot-Production Testing Contractor. Pilot-production testing shall be in accordance with Performance Requirement NAWCADLKE-09-PR-4869-001 and Performance Specification NAWCADLKE-PS-4869-06-001. Testing shall commence 180 after contract award.

3.6.2.1.1 Pilot-Production Test Plan. The contractor shall prepare and submit a pilot-production test plan in accordance with CDRL B012.

3.6.2.1.2 Pilot-Production Test Report. The contractor shall prepare and submit a pilot-production test report in accordance with CDRL B013.

3.6.3 Government Evaluation Testing. One of the pilot-production A/M32U-21's shall be used for the Government's technical evaluation and fleet evaluation of the trailer. Full Contractor support shall be required. This will include, as a minimum, complete technical data, operating instructions for the equipment, spare materials and technical representative

support if required. Government evaluation testing will commence 240 after contract award for duration of 90 days.

3.6.4 Production Testing. Each production trailer shall be tested in accordance with Performance Requirement NAWCADLKE-09-PR-4869-001 and Performance Specification NAWCADLKE-PS-4869-06-001.

3.7 TECHNICAL DATA PACKAGE

The product drawings shall be complete, detailed (full disclosure) monodetail drawings. Full disclosure drawings are defined as engineering drawings and associated lists that contain sufficient information to enable any competent manufacturer to successfully produce and maintain quality control of any given item to the degree that it's physical and performance characteristics are identical to and interchangeable with the same item as produced under this contract. "Monodetail" is defined in ANSI Y14.24M. Additionally, such drawings shall allow for the item to be produced or reprocured without resorting to additional product design effort, additional design and/or manufacturing data or recourse to reverse engineering.

3.7.1 Format. These drawings shall be prepared in accordance with NAEC 09-4 drawing practices manual. The Drawings shall be dimensioned and toleranced using geometric dimensioning and tolerancing principles and symbology in accordance with ANSI Y14.M. The units of measurement to be used will be consistent throughout the drawing package. Drawings which make reference to company standards, or processes or drawing numbers are prohibited. Drawing numbers will be established by NAWCADLKE in blocks for each assembly. These assigned drawing numbers will be used in performance of all aspects of the contract including ILS efforts. Drawing notes for weldments, and all nondestructive tests and inspections shall be per ANSI/AWS A2.4. The Government CAGE number, 30003, shall appear on all documents submitted. The drawing package structure shall be a top-down breakdown of assembly drawings in order to support the development of ILS requirements.

3.7.1.1 Source and Specification Control Drawings. All source control drawings, specification control drawings, and other drawings of commercially available or subcontractor developed items, shall have reliability requirements for that item on the drawing. The requirements shall consist of one or more of the following:

1. Detail reliability test requirements such as: cycling, environment, test duration, pass-fail criteria needed to maintain the required reliability.
2. Detail the failure area(s) in design, construction, material, and inspection/QA of the item so that the required reliability is maintained.
3. Use of industry standard high quality parts where the standard's qualification test is adequate for the required item reliability.

Source Control Drawings approval requests shall be submitted in accordance with CDRL B016.

3.7.1.2 Performance/Test Requirement Drawings. Separate performance/test requirements drawings shall be prepared for any assembly or electronic module requiring performance testing, and submitted as part of the product drawings. The performance/test requirements drawings shall contain test parameter requirements and acceptance criteria which are adequate to assure that all accepted assemblies and modules provide specified system performance when installed in the higher level assembly. The performance/test requirements drawings shall also include environmental and reliability performance requirements adequate to assure the higher levels of assembly will meet all environmental and reliability requirements specified at the system level. Assembly drawings shall include detailed information describing all procedures, requirements and processes necessary assemble and prepare the item to be installed at the next higher assembly.

3.7.2 Data Rights. All drawings for parts or components designed/ developed or procured for the trailer submitted in accordance with this statement of work shall be furnished with unlimited rights as defined in the "Right in Technical Data" clause cited elsewhere in the contract. Each sheet of each drawing shall bear the following notation in Gothic letters: "THIS DOCUMENT HAS BEEN PURCHASED BY THE GOVERNMENT AND MAY BE REPRODUCED AND USED IN CONNECTION WITH ANY GOVERNMENT PROCUREMENT, MAINTENANCE OPERATION OR ENGINEERING OPERATION". No drawings delivered for this procurement shall be marked “Proprietary”.

3.7.3 Drawing Submittals. The drawings shall be submitted as an Initial Set and a Production Set in accordance with 3.7.3.1 through 3.7.3.5.

3.7.3.1 Initial Set. The Initial Set (IS) submission shall be made by the contractor in accordance with CDRL B017. The IS submission shall consist of four full size or 11”x17” duplicate prints of all drawings and associated lists reproduced from the originals, and 2 electronic copies on compact disk, one in native format and one in IGES 4.0 format in accordance with ANSI Y14.26M. Electronic drawings shall be prepared using CAD software equivalent to AUTOCAD version 2000 or better. The IS will be reviewed for overall compliance with MIL-STD-100 and other drawings requirements cited herein and elsewhere within the contract. The IS shall also be used as the baseline to conduct the physical configuration audit. Drawings will subsequently be returned to the contractor for incorporation of all Government comments marked in red prior to the Production Set (PS) submission.

3.7.3.2 Production Set. The Production Set (PS) shall be submitted by the contractor in accordance with CDRL B017 and shall serve as the documented identification of the configuration baseline for subsequent hardware contract(s) or option(s). The contractor shall use the Government approved PS product drawings and associated lists required for subsequent contract(s) or option(s) as the engineering data for ordering, controlling, and utilizing materials, parts, assembles, etc., whether in-house or vendor supplied, and for the fabrication, assembly, inspection, testing and acceptance of the materials, parts, modules and assemblies of the equipment on order. The PS shall have all Government "red-lined" comments incorporated that appear on the returned IS submission. Additionally, the PS shall include all approved changes (including correction of PCA discrepancies)

made to the drawings since submission of the IS and exactly represent the production hardware.

3.7.3.3 Revisions/Contractor Configuration Control. Subsequent to the IS and PS submissions, any approved changes to the hardware or drawings necessitated for reasons of compatibility, producibility, design corrections, etc. shall be promptly incorporated and reflected in all related drawings by revising them to the next higher issue. Copies of the revised drawings shall be provided to the Government concurrent with the contractor's configuration management release procedure. Thus, at any point in time the Government and contractor will have a complete and identical set of MIL-STD-100 Product drawings which define the configuration on contract. The submission of updated (revised) drawings and the contractor's change authorization document shall be monthly and begin subsequent to the IS submission and continue until final approval of the PS.

3.7.3.4 Revisions/Government Configuration Control. After submission, review and final approval of the PS drawings by the Government, the government configuration control requirement shall be applied to the drawings until the last production unit has been delivered. Drawing revisions necessary as a result of approved ECP changes shall be made to the drawings by the contractor within 15 days of ECP approval.

3.7.3.5 Reproducibility. The digital drawing files shall convert to PDF format that reproduce neat, clean, clear images.

The contractor shall provide full manufacturing/production drawings for all non-COTs items and Altered Item drawings for any modified COTs items. The contractor shall provide Specification or Source Control drawings (as defined in MIL-T-31000) for all COTs items. Navy unique drawing number assignments will be provided for use on all contractors delivered drawings. Contractor developed drawings (full manufacturing, Altered item, Source control or Spec control) shall be submitted in accordance with CDRL B017.

3.8 INTEGRATED LOGISTICS SUPPORT

The Integrated Logistical Support (ILS) requirements are designed to accomplish the following objectives:

a. Establish valid contractual minimums relative to supportability requirements and facilitate planning, management, and execution of the trailer ILS Program.

b. Provide specific requirements that will permit the contractor to respond with valid cost, schedule, and resource commitments to satisfy the trailer ILS Program.

The contractor shall provide the personnel, services, materials, and facilities to plan, implement and execute an ILS program for the duration of the contract and any related supplies and services contracts. This document sets forth the principle elements of ILS planning needed to satisfy the objectives of integrating all ILS elements with the delivery of the trailer.

3.8.1 ILS PROGRAM MANAGEMENT

3.8.1.1 Contractor ILS Manager (ILSM). Management of the contractor's ILS program shall be vested in a single manager who has the responsibility and authority for execution of the complete trailer ILS program set forth in this document. The contractor ILSM shall serve as the focal point for relation/interface with the Navy in all matters pertaining to the ILS program.

3.8.1.2 ILS Subcontractor(s). An ILS subcontractor may be used to accomplish some or all of the ILS requirements of this document. The prime contractor's ILSM shall be responsible for the subcontractor's performance. Management of the ILS program may be delegated to a subcontractor provided the prime contractor maintains ultimate responsibility. All ILS efforts and data deliverables developed by an ILS subcontractor ILSM for delivery to the Navy, shall be the prime contractors responsibility for contract compliance.

3.8.1.3 Navy/Contractor Interface. The Navy ILS organization, identified herein, is intended to assist the contractor in developing and implementing the ILS program set forth in this document. The Navy ILS organization will consist minimally of a Naval Air Warfare Center Aircraft Division Lakehurst (NAVAIRLKE) Team Lead (TL), Assistant Program Manager Logistics (APML), Project Engineer (PE), Test Engineer (TE), and applicable Logistics Element Managers (LEMs).

3.8.1.4 Integrated Logistics Support Team (ILST)(CDRL L001): ILST review meetings will be scheduled in conjunction with other program reviews or as scheduled by mutual agreement of the Navy and the Contractor. These meetings will be used to provide additional guidance, review program status, logistics tradeoff/alternative decisions and/or clarify processes. The contractor shall coordinate and provide administrative support, prepare agendas, take minutes and ensure timely distribution of said minutes to all attendees, and document and track action item status.

3.8.1.5 ILS Program Progress Reports (CDRL L002): The contractor shall prepare an ILS Program element status, action item status, and narrative summary identifying the progress, delays, and/or problems associated with each ILS element. As a minimum, the status summary shall correspond to each ILS element identified herein, along with each ILS deliverable identified within this document. The contractor shall provide reasons, recommendations concerning delays and/or problem areas.

3.8.2 ILS REQUIREMENTS

3.8.2.1 LOGISTICS MANAGEMENT INFORMATION (LMI) CANDIDATE LISTS (CDRL L003): The Contractor shall provide logistics Management Information in accordance with MIL-PRF-49506 and submit a Three Part Maintenance Plan (LSA .024 rpt)with top down breakdown of components and recommended appropriate preventative and corrective maintenance instructions, operating precautions, preparation for shipment, storage and recommended support equipment. He drawing package shall be a production level with top down breakdown. The documentation shall also include any additional data required for the Navy to finalize the Three part Maintenance Plan in accordance with MIL-PRF-

49506, the A/M32U-21 PSOW (Appendix C), refer to DATA ITEM DESCRIPTION DI-ALSS-81529.

3.8.2.2 Maintenance Planning Technical Data Package (MPTDP) (CDRL L004): The contractor shall submit using contractor format, A MPTDP identifying indenture block diagram of parts will be submitted in English, sixty (60) days after contract award.

3.8.2.3 Documentation. All documentation listed on the MPTDP shall be considered part of the MPTDP and shall be submitted by the contractor as part of the MPTDP with the same rights in technical data as described in the contract.

3.8.2.4 Baseline Configuration. The contractor shall establish a production baseline configuration. The Original drawing package (PARA 3.7.3.2) shall include all the corrections, deletions, and modifications having occurred during development and be included in the production-drawing package.

3.8.2.5 Drawings. The following drawing types outlined shall be in accordance with MIL-T-31000 as guidance (see PSOW, Appendix C, para 4, 5, 6, and 12 Refer to SOW para 3.7)

a) Commercial or vendor available items are used and interface and specification requirements are not critical.

b) Qualification testing of commercial or vendor developed items in advance of procurement is not required.

c) Testing has demonstrated that the items have met stated requirements.

3.8.2.6 Source Control Drawings. The contractor shall develop a Source Control Drawing which disclose size, configuration, and dimensions of envelope, interface dimensional characteristics, specifications and item testing. The contractor shall develop a Source Control Drawing which depicts a commercially or vendor available item which exclusively provides the performance and specification required. The contractor shall list at least one approved source on the drawing, while identification of the approved source(s) is not to be construed as a guarantee of present of continued availability as a source of supply. The contractor’s source control drawings as a minimum shall reference the criteria necessary for evaluating a proposed substitute as an alternate item. The contractor shall identify criteria to include the technical data required for evaluation and approval, any testing required to demonstrate compliance with specified characteristics and requirements and establish responsibility for accomplishment of item testing. The contractor shall prepare source control drawings when:

a) The item(s) has critical interface and specification requirements.

b) Performance requirements of the item can only be met by one of several approved sources.

c) Testing has demonstrated that the items have met stated requirements.

3.8.2.7 Altered Item Drawings. The contractor shall develop an altered item drawing to delineate complete details of the alterations, selections of special requirements. The contractor shall include data necessary to identify the vendor item prior to its alteration or selection, including the original part. The contractor shall identify the original vendor part by placing the words “SEE NOTES” in the stock selection of the list of materials. In the notes the vendor, CAGE code, address and vendor part number shall be identified by the contractor. In the case in which the original part is a Government or commercial standard item, the original part number shall be identified in the stock section of the list of materials following the ‘MAKE FROM’.

3.8.3 SUPPLY SUPPORT

The Provisioning Statement of Work (PSOW) (Appendix C), which has been prepared by the Naval Inventory Control Point (NAVICP), specifies the supply support and provisioning documentation required.

3.8.3.1 Provisioning Documentation. The contractor is requested to provide, as part of their contract with the United States Navy, information on all maintenance, supply support and warranties offered in conjunction with the purchase of the units.

3.8.3.2 Maintenance Planning Data. See para 3.8.2.1.

3.8.3.3 REPAIRABLE PARTS LIST (CDRL L005): The contractor is to deliver a preliminary Repairable Parts List (RPL). The contractor will be required to submit a final RPL within 60 days after final drawing acceptance (CDRL L005 applies). The RPL is to provide a top down breakdown of the unit. The top down breakdown is accomplished by sequencing all parts comprising the end item in a lateral and descending “family tree/generation breakdown.” The breakdown shall consist of the end item including all components, listing every assembly and part, which can be disassembled, reassembled and/or replaced.

The contractor shall utilize his own format for the submittal of the RPL data, but shall include the following information: reference number (Contractor generated sequence number), true vendors part numbers, true vendors CAGE, nomenclature, National Stock Number if known, unit of issue, quantity per end item, quantity per assembly, cost per unit, cost per item, shelf life if applicable, calibration schedule if applicable, expected Mean Time Between Failure (MTBF) rate, Mean Time To Repair (MTTR) this includes identify, remove/replace and verify corrective action of the effected item.

3.8.3.4 INTERIM SUPPORT ITEMS LIST (CDRL L006). The contractor shall submit in writing (CDRL L006) an Interim Support Items List (ISIL) of spare and repair parts for the support of the trailer for a period of 24 months. The ISIL shall be prepared utilizing the government provided Interactive Computer Aided Provisioning System (ICAPS) database and submitted to NAVICP in ICAPS format. The Government will use the data to identify, select and procure the minimum spares and repair parts necessary to permit interim and continued supply support. The Government during this process will take warranty into consideration in determining stocking levels.

The contractor shall provide as part of the contract response information on parts and end item unit warranties offered in conjunction with the purchase of units.

3.8.4 PROVISIONING CONFERENCES

The contractor shall host a Provisioning Guidance Conference to assist in preparing the provisioning documentation, if required. The provisioning guidance conference provides information concerning preparation of the data for compatibility with the NAVICP database. The contractor shall provide consulting support via phone to the provisioning effort, as required.

3.8.5 WARRANTY

The contractor shall provide a minimum 12-month warranty for the trailer system to include its component parts covering repair parts, labor and transportation. The warranty period shall begin with acceptance by the Government.

3.8.6 TECHNICAL MANUAL DATA

This section specifies the requirements for development, validation/verification and delivery of trailer Technical Manuals (TMs). The TMs shall be delivered in accordance with the Technical Manual Contract Requirements (TMCR) provided as Appendix B (TMCR Number 08-022, dated 10 December 2008). The TMs will become property of the U. S. Government.

3.8.6.1 TECHNICAL MANUAL REQUIREMENTS (CDRL L007). There shall be a work package format TM with Illustrated Parts Breakdown (IPB) for Operation and Maintenance of the Trailer. Periodic Maintenance Requirements Cards (PMRC's) and Pre-Operational Checklists (Pre-OP's) shall also be developed for the Trailer in accordance with TMCR 08-022 (CDRL L007).

3.8.6.2 Quality Assurance (QA) The contractor shall provide and implement a TM QA Program specified in the TMCR. In-Process Reviews (IPR's) shall be scheduled at, 30%, 60% and 90% of TM completion and at any other time deemed necessary by the Government or the contractor. The 90% IPR shall be completed prior to the TRR.

3.8.6.3 Technical Manual Validation/Verification Certification (CDRL L008). A Contractor/Government TM Valdidation/Verfication shall be conducted for all developed TM's, PMRC's, Pre-OP's. A Validation Certificate provided in Appendix B (TMCR) shall be submitted by the Contractor per CDRL L008.

3.8.7 TRAINING
The training method established herein is designed to ensure adequate Navy training capability for the A/M32U-21 Airborne Armament Maintenance Trailer (AAMT). Based on results of supportability task analysis and test evaluation, the training shall enable Navy maintenance and instructor artisans to provide initial familiarization and/or formal follow-on training to Fleet Support Equipment (SE) operators/maintainers.

3.8.7.1 Training Requirements
The contractor shall evaluate the data and develop the training deliverables in accordance with the Contract Data Requirements Lists and stated requirements contained herein. The below described Course Conduct Package materials shall be in accordance with NAVEDTRA130A course development guide, and documented in the Authoring Instructional Materials (AIM II) software program. If the contractor has a commercial training course already established it can be used as the basis for the Navy Course Conduct Package and documented in the AIM II software package. The completed Course Conduct Package shall be traceable to the government approved Maintenance Plan (MP) and Technical Manual (TM).

3.8.7.2 Operation Support Training
The contractor shall develop the data products for the end item follow-on training program. Program operation support training consists of Training Analysis Documentation and Training Conduct Package as described in the following paragraphs.

3.8.7.3 Training Analysis Documentation
The contractor shall provide a Learning Analysis Report (LAR), CDRL L009. The LAR will be used by the government and selected contractor training manager to review the development of the course during scheduled Training Program Reviews (TPRs), which may be held separately or in conjunction with the 30-60-90% Technical Manual In Process Reviews (IPRs).

3.8.7.4 Training Course Conduct Package (TCCP)
The contractor shall develop a Training Course Conduct Package (CDRL L010) capable of supporting Navy organic SE operators in existing Naval Enlisted Classifications (NEC). Final course delivery shall consist of corrected copies of the TCCP and AIM II files which shall contain an Operator’s Course file. The conduct package consists of a Training Course Control Document, Lesson Plan, Trainee Guide, Testing Package and Instructional Media Package. These training materials shall be documented using the AIM II software package, and shall be directly traceable to the item TM and MP. The Government Training Manager and designated Contractor Logistics/Training Manager (CLTM) shall coordinate the development of the above documents in order to meet the projected delivery date. The CLTM shall plan for a monthly agreed upon telephone conference, with the training manager, to discuss issues and the status of the training package development. Training shall consist of the following:

a. Operation Instruction, (As a minimum, they must include Start-up and Shut-down procedures along with all applicable Safety Instructions, Cautions, Warning, etc.)

b. Use of the Technical Manual to trouble-shoot and operate the unit.

c. Instruction on maintenance, spare parts and consumable replacements. During this portion of the training the Contractor shall provide users with an overview of spare parts replacement, and shall provide instructions pertaining to any disassembly or components required so that replacement may proceed in the future. As part of this training, spare parts need not be replaced to complete the familiarization, but must be illustrated in the unit Technical Manual. Training shall take place at a Government designated facility (facility to be designated at a later date). Contractor is required to supply all parts, material and labor to perform this effort.

3.8.7.5 Government Furnished Information
The following materials, upon request, will be provided by the Government at, or soon after, the Post Award Guidance Conference to assist in the development of training course materials by the contractor:

a. Any existing course materials that may provide background information on existing or comparison equipment that may relate to or assist in the development of new training materials.

b. Available Technical Manuals for comparison equipment will be provided, as approved by the Contracting Officer, for source data analysis and comparison by the contractor during development of course material.

c. AIM software package and training as required.

d. NAVEDTRA 130A and all referenced Data Item Descriptions (DID) can be found on the Human Performance Center website: https://www.spider.hpc.navy.mil/. Select the Acquisition tab and then the Policy/Guidance tabs. DIDs can be found under MIL-PRF-29612B Data Item Descriptions (DIDs). NAVEDTRA 130A can also be found with the search utility.

3.8.7.6 Initial Factory Training
The contractor shall provide initial Operator training for the production system to Navy instructors, initial cadre of fleet personnel, and other personnel deemed essential. The Contractor shall utilize the “DRAFT” of the deliverable Course Conduct Package materials to conduct this training session. The initial factory training session provides the vehicle for the contractor to validate the training course prior to initial delivery to the government. The training program stresses the performance of job related tasks in a practical/laboratory environment and shall be directly traceable to the TM and MP for the end item. Classroom/lecture time shall be held to a minimum. Trainees shall have as much time as can be given to learn/perform the tasks that will be required in the performance of future job(s). The contractor shall also develop a Course Completion Data (CCD) package for this training session. It shall be developed and delivered as per CDRL L011. The student-instructor ratio shall not be greater than 10 to 1 in the theoretical phase of the course, and no greater than 5 to 1 in the practical application phase. The contractor shall provide an Initial Factory Training

outline per CDRL L012. Initial Factory Training shall take place no later than 120 days prior to the delivery of the production end item to the fleet.

3.8.8 RELIABILITY-CENTERED MAINTENANCE (RCM) - Option

3.8.8.1 Reliability Centered Maintenance (RCM) Analysis shall be conducted at the Government's discretion on the system after completion of pilot-production unit testing but prior to full-scale production.

3.8.8.2 RCM Is an analytical process used to determine the appropriate failure management strategies to ensure safe operations and cost effectiveness. This process, with an auditable documentation package, is based on the severity of the failure and the consequences related to safety, environment and mission if a failure occurs, and the cost effectiveness of the task meant to prevent the failure. The true goal of RCM is to *reduce the consequences* of the failure, not necessarily to avoid the failure altogether. This is accomplished through the RCM review group performing a failure modes and effects analysis (FMEA) and then using the RCM logic algorithm to determine the most appropriate failure management strategy to avoid or possibly eliminate the consequence of the failure.

The RCM process will be used for the analysis, which is fully compliant with SAE JA1011, Evaluation Criteria for Reliability-Centered Maintenance Processes and SAE JA1012, A Guide to the Reliability-Centered Maintenance Standard. The RCM analysis shall be conducted at the Governments discretion on the system after pilot-production evaluation but prior to full-scale production. The contractor shall be required to provide up to 160 hours of engineering and technical support. The contractor shall attend and participate in the NAVAIR RCM. Government personnel and the contractor will audit the RCM analysis results and the proposed recommendations will be provided to the program manager and contractor. The contractor shall utilize the results of this analysis to establish preventive maintenance requirements and it shall be the source of information for the development of Scheduled Maintenance Requirements. The NAVAIR RCM process includes a 3-day training course and a 2-week analysis-working group at the contractor's facility. A 3-day audit-working group then follows the RCM analysis, at a later date.

3.9 PRODUCTION PLANNING

3.9.1 Facility Planning. The contractor shall ensure the required production delivery schedule and rate can be met, considering the overall demand for facilities and personnel from other programs. The contractor shall:

a. Determine the types of manufacturing processes and methods required and the associated tooling and test equipment requirements. Where required processes or equipment do not exist, the contractor shall determine whether they will be developed or outsourced and shall identify appropriate schedules for design/purchase and installation.

b. Identify manufacturing risks and strategies for their mitigation.

c. Develop and set up the facility layout sufficient to ensure that machine loading, fabrication and assembly sequences, and part routings minimize part in-transit and queue time.

3.9.2 Material Planning. The contractor shall identify the types of materials and components needed for the construction of the end item, considering producibility considerations and the availability of the material or parts.

3.9.3 Manpower Planning. The contractor shall identify the number of shop personnel required in each labor category and the skills and training required. Considering the phasing of manpower requirements and the ability to add personnel to the workforce, the manpower planning process(es) shall schedule the acquisition and training of personnel.

3.9.4 Work Planning. The contractor shall determine and schedule work order and purchase order releases, parts and material procurement, part/component fabrication, evaluation, assembly, test, and delivery based on lead time required delivery dates, inventory records, bills of material, and available facilities and labor.

3.9.5 Production Scheduling and Control. The contractor shall employ process(es) of its own design for production scheduling and control. Through the execution of its production scheduling and control process(es), the contractor shall monitor variances between actual and planned schedules and costs and shall use that feedback to identify and implement necessary corrective actions and to incorporate productivity improvements. The contractor shall notify Defense Contract Management Agency (DCMA) of anticipated contract delivery schedule delinquencies, production difficulties, quality problems, or delays, which may adversely affect the program.

3.10 UNIQUE IDENTIFICATION REQUIREMENT

Unique Identification (UID) is a Department of Defense (DoD) program that will enable easy access to information about DoD possessions that will make acquisition, repair, and deployment of items faster and more efficient. In accordance with DFARS Clause 252.211-7003 Item Identification and valuation, the contractor is required to mark and register all end items and their components meeting the requirements called out in MIL-STD-130M. UID Data is encoded into Data Matrix symbols that are applied directly to parts. The UID for the trailer shall be in accordance with NAVAIR drawing 3909AS9999 and MIL-STD-130M.

3.11 PACKING, HANDLING, STORAGE AND TRANSPORTATION

The contractor shall verify the packaging and marking requirements in accordance with the respective paragraphs of performance specification NAWCADLKE-PS-4869-06-001.

3.12 DATA DELIVERY

The contractor shall deliver all Contract Data Requirement Documents in electronic format unless otherwise specified in the CDRL. The documents shall be developed using commercially available software. Microsoft Word is

the preferred word processing software. AutoCAD 2000, or higher is the preferred drawing/modeling software.

3.12.1 Contract Data Requirement List (CDRL) DD FORM 1423.

All deliverable data items required by this SOW are cited in Appendix A. For reference purposes they are listed below.

CDRL No.	Title	Subtitle
A001	Integrated Master Schedule	
A002	Progress Reporting	
A003	Configuration Management Plan	
A004	Management Plan	Program planning, control and subcontractor control
A005	Conference Agenda	Program Management Review
A006	Conference Minutes	Program Management Review
A007	Hazardous Material Management Program Plan	
A008	Hazardous Material Management Program Report	
B001	Conference Agenda	Preliminary Design Review
B002	Conference Minutes	Preliminary Design Review
B003	Conference Agenda	Critical Design Review
B004	Conference Minutes	Critical Design Review
B005	Technical Report	Structural Analysis
B006	Technical Report	Fatigue Analysis
B007	Physical Configuration Audit Plan	
B008	Physical Configuration Audit Report	
B009	Engineering Change proposal	
B010	Request for Deviation	
B011	Request for Waiver	
B012	Pilot-Production Test Plan	
B013	Pilot-Production Test Report	
B014	Technical Report	Failed Item Analysis
B015	Technical Report	Failure Summary and Analysis
B016	Source Control Drawing Approval Request	
B017	Technical Data	Engineering Drawings and Associated List
B018	Conference Agenda	Test Readiness Review
B019	Conference Minutes	Test Readiness Review
B029	Conference Agenda	Production Readiness Review
B030	Conference Minutes	Production Readiness Review
L001	Integrated Logistics Meetings	ILSMT
L002	Logistics Progress Reports	Progress Reports (ILS)
L003	Logistics Management Information	LMI Candidate List

CDRL No.	Title	Subtitle
L004	Maintenance Planning Technical Data Package	MPTDP
L005	Repairable Parts List	RPL
L006	Interim Support Item List	ISIL
L007	Technical Manual	TM
L008	TM Validation Certificate	Validation Certificate
L009	Learning Analysis Report	LAR
L010	Training Course Conduct Package	TCCP
L011	Course Completion Data	CCD
L012	Training Outline	Training Outline
P006	Long Lead Time Items List	LLTIL
P007	Provisioning Parts List	PPL
P008	Design Change Notices	DCN
P009	Engineering Data for Provisioning	EDFP
P010	Statement of Prior Submission	SPS

3.12.2 Data Item Approval. For those data items for which approval is required, the approving agency/code is the first addressee in Block 14 of the CDRL.

3.13 GOVERNMENT FURNISHED MATERIAL (GFM)

The Government shall provide the contractor with MEP-803A generators, MEP-813A generators and P185WJDU Air Compressors as Government Furnished material.

3.13.1 Pilot-Production GFM. The Government shall provide the contractor with two MEP-803A generators, two MEP-813A generators and two P185WJDU Air Compressors within 60 DAC in order for the contractor to assemble two pilot-production A/M32U-21 trailers.

3.13.2 Production GFM. The Government shall provide the contractor with the appropriate number of MEP-803A generators, MEP-813A generators and P185WJDU Air Compressors within 60 days after release for production or exercise of an option.