

Aircraft Related Services

STATEMENT OF WORK

August 24, 2015

TABLE OF CONTENTS

1.1 RESPONSIBLE OFFICIALS..... C-1

1.2 AIRCRAFT AND FACILITIES..... C-2

2.0 Scope..... C-3

 2.1 OBTAINING SERVICES..... C-3

 2.2 REQUIRED SERVICES..... C-4

2.3 Aircraft Operations Services..... C-4

 2.3.1 MAINTENANCE AND TECHNICAL SERVICES..... C-4

 2.3.2 GROUND SUPPORT EQUIPMENT SERVICES..... C-5

 2.3.3 MECHANICAL FABRICATION SERVICES..... C-6

 2.3.4 ELECTRONIC/ELECTRICAL TECHNICIAN SERVICES..... C-6

 2.3.5 TECHNICAL DOCUMENTATION SERVICES..... C-6

 2.3.6 AVIATION LIFE SUPPORT EQUIPMENT (ALSE) SERVICES..... C-7

 2.3.7 FLIGHT RECORDS..... C-7

2.4 Test Support Services..... C-7

3.0 Material Procurement and Subcontracting Services..... C-7

 3.1 AIRCRAFT MATERIAL PROCUREMENT AND SUBCONTRACTING..... C-7

 3.2 ON BOARD SENSORS, RESEARCH-RELATED INSTRUMENTS, AND DATA DISTRIBUTION SYSTEMS..... C-8

4.0 Wind Tunnel Support Services..... C-8

5.0 NASA Unmanned Aircraft Maintenance and Operations..... C-8

 5.1 MAINTENANCE AND OPERATIONS SUPPORT..... C-9

6.0 Reliability, Quality, Safety, and Product Assurance..... C-11

 6.1 QUALITY SYSTEM..... C-11

 6.2 RISK MANAGEMENT..... C-12

 6.3 MISSION ASSURANCE..... C-12

 6.3.1 INSPECTION AND TESTING..... C-12

 6.3.2 CONTROL OF NONCONFORMING PRODUCT AND SERVICES..... C-13

 6.3.3 GIDEP ALERT REVIEWS..... C-13

 6.3.4 RECORDS..... C-13

 6.3.5 OCCUPATIONAL SAFETY AND HEALTH..... C-13

 6.3.6 HAZARDOUS MATERIALS MANAGEMENT..... C-13

7.0 Training..... C-14

8.0 Contract Management and Administration..... C-14

 8.1 RESOURCE SCHEDULING..... C-15

 8.2 CONTRACT REPORTING..... C-15

 8.3 PROPERTY MANAGEMENT..... C-15

9.0 Phase-In/Phase-Out..... C-15

 9.1 PHASE-IN..... C-15

 9.2 PHASE-OUT..... C-16

10.0 Appendix..... C-17

11.0 Abbreviations and AcronymsC-19

1.0 Introduction - Aircraft Services

This Statement of Work (SOW) describes the requirements for contract services to be provided to the U.S. Army Aviation Development Directorate - Aeroflightdynamics Directorate (ADD-AFDD) at the NASA Ames Research Center (ARC), Moffett Federal Airfield. The work to be performed covers aircraft operations, research aircraft systems, engineering, training and administration.

One of the important functions of (ADD-AFDD) is conducting flight research in support of the ADD-AFDD mission at the NASA ARC. The principal aircraft involved in this flight activity are assigned to the ADD-AFDD by the U.S. Army Materiel Command (AMC). Flight research is conducted in accordance with a Memorandum of Agreement between the Army and NASA. Under this agreement, contracting for services such as this effort is performed by the NASA ARC.

The ADD-AFDD (and its predecessor organizations), an element of the Research, Development & Engineering Command (RDECOM), has been a resident and joint research partner with NASA at the ARC for fifty years. The ADD-AFDD Director has been designated as the Airworthiness Authority for modifications made to the assigned Army aircraft. The ADD-AFDD also oversees all aircraft maintenance and modification activities, and are responsible for compliance with applicable regulations, criteria and procedures.

The ADD-AFDD is responsible for the research, technical investigations, and scientific studies conducted with the Army aircraft at NASA Ames. This Directorate has the charter for the definition, programmatic implementation, and technical management of the related airborne and/or ground-test activities. This Directorate is also responsible for testing rotorcraft systems in NASA Ames wind tunnels.

1.1 Responsible Officials

The ADD-AFDD is responsible for all aircraft operations and related services covered by this SOW and have established specific responsible officials to carry out the concomitant duties and functions. The Flight Projects Branch (FPB), a branch within ADD-AFDD, is responsible for all aircraft operations associated with Army research activities at the NASA ARC. This Branch manages the training and scheduling of flight crews responsible for the in-flight command of all aircraft used for these purposes and coordinates aircraft operating schedules. The Flight Projects Branch evaluates aircraft configuration changes proposed by researchers and provides recommendations to the Director, ADD-AFDD, regarding the Airworthiness of the proposed changes.

As the Contractor supports the requirements of the SOW through Task Orders, the Contractor will interface with the following:

- Chief of Flight Projects - Manages and administers the Flight Projects Branch; coordinates and manages the rotorcraft research flight program and the use of aircraft; reviews Flight Test Project Requests and Configuration Change Requests; advises on requirements for and membership of Safety of Flight Review Board; coordinates Airworthiness Releases; approves all flight test plans.

- Airworthiness Officer - Serves as the Secretary/Recorder of the Safety of Flight Review Board; maintains the Safety of Flight Review files; coordinates airworthiness substantiation documentation; oversees configuration management efforts.
- Flight Research Operations Officer - Establishes and manages the aircrew training and standardization program; assigns flight crews, conducts briefings, schedules aircraft; ensures individuals comply with applicable regulations and directives for each flight; maintains Aircrew Information Reading File; ensures aircraft operator's manuals and checklists are updated as required; maintains Aircraft Supplemental Logbooks; maintains and completes aircrew flight records
- Aviation Safety Officer - Coordinates development and execution of the Army Aviation Accident Prevention Program (reference DA Pamphlet 385-90); serves as the ADD-AFDD representative on the Ames Safety Council; serves as a member of each Safety of Flight Review Board; maintains a current hazard map for the use of all aviators
- Aviation Maintenance Officer – Monitors aircraft maintenance operations; advises the Chief of maintenance implications of proposed modifications; schedules maintenance test flights as required.
- Government Flight Representative - Approves Contractor operating procedures; approves all Contractor aircraft operations; approves all instances of Contractor personnel flying aboard Army aircraft; assembles an Aviation Support Team and conducts annual surveillance of Contractor Procedures.
- Flight Systems Engineering Lead – Manages the Flight Systems Engineering Group responsible for the mechanical and electrical system and sub-system design for all research system modifications made to the aircraft and related support equipment and facilities; oversees the configuration management program.

The Flight Projects Branch, jointly with the Government Flight Representative (GFR), also ensures compliance with appropriate maintenance, repair and inspection procedures and the use of appropriate practices and procedures for the aircraft modifications. Because the relationship between the Contractor's duties and the responsibilities of the Flight Projects Branch, it will be necessary for Contractor personnel and FPB staff to work closely and communicate effectively on all activities pertaining to flight operations.

Government Personnel are responsible for any interaction with the Moffett Federal Airfield Lessee, not the Contractor.

The Contracting Officer's Representative (COR) is the principal technical point of contact for the Government in providing technical direction on this contract. The primary duties of the COR are listed in the contract clause NFS 1852.242-70 *Technical Direction*.

1.2 Aircraft and Facilities

The following aircraft are currently assigned to the Aeroflightdynamics Directorate:

<u>TYPE</u>	<u>AIRCRAFT NUMBER</u>
EH-60L	87-24657
JUH-60A	78-23012
OH-58C	71-20724
RMAX	444/445

Aircraft may be added, deleted or substituted during the period of performance of this contract.

Annual flight time typically totals 300 flight hours; however, the actual flight hours may be increased or decreased as needed to meet the requirements of the various research projects. The two RMAX helicopters, which are Rotary-wing Unmanned Aerial Systems (UAS), are utilized by the ADD-AFDD.

The aircraft operations facilities consist of the building 248 complex at the NASA ARC, which includes associated adjacent storage, ramp, garage, and hangar buildings.

2.0 Scope

This Statement of Work (SOW) describes the services required to fulfill the flight research mission and requisite support activities of the organizations identified in Section 1.0 above. These services fall into the following areas:

- Aircraft Operations Services
- Test Support Services
- Material Procurement and Subcontracting Services
- Wind Tunnel Support Services
- NASA Unmanned Aircraft Maintenance and Operations
- Reliability, Quality, Safety, and Product Assurance
- Training
- Contract Management and Administration

2.1 Obtaining Services

All services and related tasks that are required to accomplish the services and supporting activities identified in this SOW shall be considered "on-going tasks".

These on-going tasks shall be performed in a timely fashion to achieve the approved research and aircraft operations schedules and will require a Contract Task Order (CTO). There are certain distinct requirements that are not specifically detailed in this SOW, but are included: Documentation Services, Training Services, Fabrication Services, and Maintenance, Inspection and Technical Services that are determined to be within the scope of this SOW, will be assigned through a CTO. CTOs will be issued and authorized by the COR and Contracting Officer (CO).

The current programs, aircraft, and facilities covered by this contract are identified in this SOW. However, within this scope of work, the Government reserves the right to increase, decrease, or revises the level of Contractor services (including adding/revising requirements) in any of the identified areas or to add Contractor services to other programs, aircraft, and facilities within ADD-AFDD or applicable NASA Ames organizations, up to and including total operational responsibility. Any such increases or decreases will be accomplished via CTO.

Aircraft modifications will be authorized by with an Aircraft Work Order (AWO). Each Government-issued AWO will consist of a clear definition of the work and performance requirements so that the work to be provided by the Contractor can be quantified. AWO's may include supporting documentation attached to them such as part drawings, hardware specifications, etc.

Travel may be required to support specific activities of this contract. In such cases, travel requirements will be authorized by a CTO. The Contractor is reminded that the CO is the only Government Official authorized to determine if a specific effort is contained within the scope of

this SOW.

2.2 Required Services

The requirements of this SOW are organized into seven Performance Areas:

- Aircraft Operations Services
- Test Support Services
- Material Procurement and Subcontracting Services
- Wind Tunnel Support Services
- NASA Unmanned Aircraft Maintenance and Operations
- Reliability, Quality, Safety, and Product Assurance
- Training
- Contract Management and Administration

Within this SOW, descriptions of services may include bulleted lists. These lists are intended to describe some of the major activities within the service being described and cannot be considered comprehensive.

All work will normally be performed on a standard eight-hour day shift. However, in order to meet the Government's objectives, the Contractor may, at times, be required to provide all or portions of these services twenty-four hours a day, including weekends and holidays. Payment of overtime premiums for Contractor services required to accommodate any non-standard work periods is delineated in FAR Clause 52.222-2, *Payment For Overtime Premiums*. The Government, to the maximum extent possible, will provide the Contractor at least a two day notice for any work schedule change.

In order to meet the unique demands of research flight tests, as well as maintenance test flights, the Contractor will be required to provide launch and recovery of aircraft beyond normal work schedules. To meet this requirement, the Contractor shall provide aircraft crew chiefs, mechanics, and avionics technicians by means of a split-shift schedule. This will provide some overlap, while covering both early and or late launch and recovery of aircraft.

Services specified herein may also be performed at other NASA facilities, installations, or other Government Agencies. However, the services performed that do not pertain to the facilities listed in Section 1.2, Aircraft and Facilities, will not represent a significant component of this contract. The CO will approve any changes for requirements to be performed outside of NASA ARC, Section F, Clause F.3 Place of Performance.

2.3 Aircraft Operations Services

2.3.1 Maintenance and Technical Services

The Contractor shall perform maintenance and technical services on assigned aircraft, related equipment and aircraft ground support equipment (GSE). The Contractor shall perform maintenance management and maintenance tasks and inspections in accordance with all appropriate Army Publications such as, Army Regulations (AR), Technical Bulletins (TB),

Technical Manuals (TM), Electronic Technical Manuals (ETM), Interactive Electronic Technical Manuals (IETM) and other applicable publications.

The Contractor shall be responsible to manage and record maintenance activities utilizing the Unit Level Logistics System-Aviation [ULLS-A (E)]. Contractor shall also be responsible for system updates and maintain the [ULLS-A (E)] electronic logbooks and servers per US Army directives.

The Contractor shall prepare written operating procedures for performing these services in accordance with the current revision of AR 95-20, and shall conduct work in accordance with these procedures throughout the contract period of performance. These operating procedures shall be submitted to the Government for review and approval no later than thirty days after contract award. The approved procedures may be amended only after review by the COR and upon the written approval of the GFR and the COR. The Contractor shall also maintain the UAS in accordance with the manufacturer's procedures, NASA guidelines and standard aviation practice.

The Contractor shall maintain the aircraft operations facilities and associated storage areas for aircraft parts, tools, and equipment, in a clean and orderly manner consistent with proper aviation facility practice and safety requirements per AR 95-20. This will include modification to the facilities to meet the operational requirements when stipulated with in a CTO.

The Contractor shall establish and maintain a stock of spare parts (either GFE or Contractor-procured) as approved by the COR. This stock shall be sufficient to support aircraft operations. In addition, the Contractor shall provide services for the issue, inventory, control, and management of expendable supplies and materials such as fasteners, O-rings, lubricants, and other miscellaneous items. The Contractor shall establish and maintain a database (inventory listing) to document the following:

- Spare parts
- Related aircraft equipment and tools which are not tracked in the NASA Ames Central Accounting System
- Research equipment and components stored at Ames, but not installed in an aircraft

The database shall include all such items with a value in excess of \$1000.

The Contractor shall establish and maintain a complete and current technical reference library for the use of authorized Contractor and Government personnel and shall perform maintenance and related work in accordance with applicable Safety-of-Flight (SOF) messages, Aviation Safety Action Messages (ASAM), and FAA Airworthiness Directives/Advisories. Any other relevant documentation should be included in the library as well.

2.3.2 Ground Support Equipment Services

The Contractor shall maintain Government furnished Ground Support Equipment (GSE).

This shall include, but is not limited to:

- Cleaning, Repair, Inspection, Preventative maintenance, and Environmental certification

The Contractor shall maintain records of all maintenance activities and inspections performed on GSE.

2.3.3 Mechanical Fabrication Services

The Contractor shall perform mechanical fabrication services, which include fabrication services, assembly, and installation of experimenter equipment support racks and structures, aircraft structure modification, aircraft structure repair, experimenter equipment platforms, aircraft stands and tools, instrument housing, and external aircraft fairing, pods, and probes. Mechanical fabrication services may support aircraft, developmental facilities (system integration labs), and telemetry systems.

To meet schedule and program requirements, the Contractor may have to seek alternative sources for fabrication services if their in-house capability cannot meet the entire demand, and it is expected that in these situations the Contractor shall first discuss the circumstances with the COR, before any action is taken. The ADD-AFDD Fabrication area will be the first consideration as an alternative, before outsourcing/subcontracting of any fabrication package can take place.

The Contractor shall be responsible for the quality and correctness of any item that is outsourced/subcontracted for fabrication.

2.3.4 Electronic/Electrical Technician Services

The Contractor shall perform electronic/electrical technician services for systems to be installed or modified in the AFDD research aircraft, ground-based development facility systems, and telemetry systems, which support the aircraft research programs. Electronic/electrical technicians who work on aircraft systems must be NASA certified to NASA STD. 8739.3. All work done for aircraft systems will be reviewed and approved by the Flight Projects Branch prior to installation. The technician work areas for aircraft systems support include, but are not limited to:

- Modification; Fabrication of electrical cables, parts and prototype subsystems and systems; Operation; Checkout; Installation; Inspection; Trouble shooting; Repair
Maintain parts inventory; and related mechanical assembly.

2.3.5 Technical Documentation Services

The documentation requirements summarized here are applicable to the broad range of specific work areas covered by this contract. The Contractor shall prepare, edit, update, maintain, archive, retrieve, reproduce and provide illustrations for:

- Operations Manuals and checklists; Maintenance Manuals; Maintenance and Inspection Records; Wiring Diagram Manuals and Drawings.
- Stress analysis reports, and other documents associated with the Research, Science, and Support programs.

All drawings and documents assigned to the Contractor shall be controlled in accordance with the project Configuration Management Plan.

2.3.6 Aviation Life Support Equipment (ALSE) Services

The Contractor shall procure, maintain and repair (or coordinate outsource repair of) all ALSE and personal flight equipment necessary for aircraft operations. The Contractor shall maintain records of all maintenance activities and inspections performed on ALSE.

Aircraft egress and water survival training is an additional requirement to be performed by the Contractor's ALSE Technician for pilots and flight crew personnel.

2.3.7 Flight Records

The Contractor shall maintain flight and pilot qualification records for assigned ADD-AFDD personnel within Centralized Aviation Flight Record System (CAFRS).

2.4 Test Support Services

The Contractor shall provide support as tasked for the following test support facilities and functions:

- Telemetry Facilities
- Hardware and software Development Facilities and Simulators
- Ground Control Stations
- Research Flight Test Courses (such as ADS-33)
- Instrumented and Non-Instrumented External Loads

Services shall include medication, fabrication, installation, preparation (i.e. test course set-up and removal), or other tasks as directed by the COR.

The Contractor will also provide Observers (OR) who will serve as non-crewmembers for research flights requiring an additional observer per a Test Plan approved by the Chief of Flight Projects Branch.

3.0 Material Procurement and Subcontracting Services

The Contractor shall procure material and subcontract services necessary to meet the requirements of this SOW. Such materials and subcontract services shall be available when required and meet stated specifications. All procurement and subcontracting activities shall be in accordance with: the Federal Acquisition Regulations (FAR), NASA FAR Supplement, NASA property regulations and guidance, as well as Department of Defense regulations and policies for aircraft flight hardware.

At the discretion of the Government, certain parts or subcontract services shall be procured using the NASA ARC Procurement or supply functions, or by the Contractor through military channels. All other material requisitions and subcontracting services performed by the Contractor shall be in accordance with FAR 52.244-2, Subcontracts.

3.1 Aircraft Material Procurement and Subcontracting

The Contractor shall provide the procurement of aircraft materials or other aviation-related items required for ADD-AFDD and other NASA Ames flight research activities, as directed by a CTO

issued by the CO.

Aircraft materials to be procured by the Contractor shall include, but are not limited to:

- Aircraft parts and equipment; Spare parts; Tools; Life support equipment; Ground support equipment; Ground support equipment parts; and Life support/personal flight equipment.

Aircraft subcontract services to be procured by the Contractor shall include, but are not limited to:

- Repairs; Overhauls; Modifications; Ground support equipment repairs and Fabrication

3.2 On Board Sensors, Research-Related Instruments, and Data Distribution Systems

The Contractor shall procure equipment and parts pertaining to on-board sensors, research instrumentation components and systems, and data recording and distribution system equipment and materials. The Contractor shall procure subcontract services for upgrades, repairs and fabrication pertaining to on board sensors, research instrumentation components and systems, and data distribution system equipment.

4.0 Wind Tunnel Support Services

The Contractor shall provide support services for ADD-AFDD involvement in wind tunnel testing and setup at Army and NASA ARC wind tunnel facilities such as the 7x10 ft. wind tunnel and National Full-scale Aerodynamics Complex (NFAC). These services will be provided under CTOs issued by the CO. Wind tunnel support services to be provided by the Contractor shall include, but are not limited to: Technical inspection, Non-Destructive Inspection, UH-60 rotor hub and associated component diagnostics, repair, and assembly; hardware and part procurement; and electronic cable fabrication.

5.0 NASA Unmanned Aircraft Maintenance and Operations

This section of the SOW describes NASA requirements for contract services in support of Unmanned Aerial Systems (UAS) at NASA Ames Research Center. These aircraft are used to develop and test new instruments, to support NASA satellite calibration and algorithm validation, as well as to support process studies of earth system phenomenon. These missions are typically in remote locations requiring significant planning, logistics, and travel.

UAS Aircraft operated by NASA:

TYPE
SIERRA-B
Viking-400s
Dragon Eyes

SIERRA-B (Sensor Integrated Environmental Remote Research Aircraft version -B) is a NASA

Category III, 400lb UAV, which provides a low altitude platform for delivering payloads up to 100lbs into remote or dangerous locations at low altitudes. The aircraft will have a flight duration of over 10 hours and can fly up to 10k ft. Avionic upgrades for DGPS and ATOL will also be incorporated into the aircraft. Once qualified, the aircraft will be available as an asset for NASA UAS missions.

Aircraft may be added, deleted or substituted during the period of performance of this contract and if required a modification will be authorized by a Contract Task Order. More information on these aircraft can be found at <http://airbornescience.nasa.gov>.

The Contractor shall be responsible for overall aircraft maintenance, operational of the NASA Category III aircraft. The Contractor shall verify the aircraft meets NASA airworthiness standards (NPR 7900.3) and provide inputs to NASA's Airworthiness and Flight Safety Review process.

The Contractor is required to deploy with the CAT III aircraft for all flight missions. The Contractor shall prepare and ship the CAT III aircraft and all support hardware for deployments as required. The contractor shall assemble/disassemble all CAT III aircraft at deployed locations as required and maintain and provide operational support of aircraft.

The Contractor shall be responsible for ensuring all Category III UAS be managed according to the NASA Aircraft Management Information System (NAMIS). The Contractor shall be responsible for maintaining current information within the following NAMIS modules: Logistics and Asset Management, Aircraft Maintenance, and Work Card.

5.1 Maintenance and Operations Support

The Contractor shall be responsible for scheduled and unscheduled maintenance of the airframes and aircraft subsystems. The Contractor shall work with the Government to provide integration support as required for support ground and flight testing. The Contractor shall support procurements of GSE and aircraft parts as well as assistance with GSE setup and maintenance.

The Contractor shall be responsible for providing quality assurance and performing aircraft inspections to ensure that all work performed on the aircraft are in compliance with NASA policies and procedures.

Contractor Responsibilities:

- The Contractor is required to follow the Center maintenance manual
- Persons signing entries in the aircraft logbook, and/or entries on Serviceable Parts Tags shall be authorized in accordance with the NASA requirements and applicable FARs and have satisfactorily completed maintenance training or possess the equivalent current experience on the applicable-type appliance, aircraft, engine, or propeller.
- Persons signing entries in the aircraft logbook, and/or entries on Serviceable Parts Tags, shall understand and have knowledge of FARs, and the applicable types of maintenance or overhaul manuals, and follow the applicable procedures set forth therein.
- Persons signing entries in the aircraft logbook, and/or entries on Serviceable Parts Tags, shall meet Center-defined certification processes.

- The maintenance plan detailed in the Center maintenance manual shall include a documented aircraft release procedure that ensures all maintenance release authorities are designated in writing. Any individual with maintenance release authority shall have at least 6 months experience in the preceding 24 months in inspecting, servicing, or maintaining an aircraft or system, in accordance with Center maintenance procedures
- The maintenance plan detailed in the Center maintenance manual shall include a documented METCAL Program that establishes policy, responsibilities, and requirements to ensure that calibrated and tested tools/special equipment performance is compared to reference CALSTDs of known and sufficiently greater accuracy.
- The maintenance plan detailed in the Center maintenance manual shall include a documented foreign object damage (FOD) control program that addresses periodicity and inspection criteria and effectively reduces the risk of FOD both during maintenance and during flight operations.
- All flight operations personnel shall be constantly on lookout for material that could be ingested into engines, struck by propeller blades, and/or blown by the exhaust of engines or propellers, causing injury to personnel or damage to aircraft.
- Maintenance personnel shall be assigned to perform a general inspection of hangar and ramp areas on a weekly basis at a minimum.
- The maintenance plan detailed in the Center maintenance manual shall include a documented tool control program (TCP) that ensures tool inventories are accurate at specific intervals, contains a lost tool process, and prohibits aircraft from flying until all tools used on an aircraft have been accounted for.
- The TCP shall provide instant inventory capability.
- The maintenance plan detailed in the Center maintenance manual shall include a documented process to ensure all GSE used on aircraft are safe and operable.
- GSE shall be maintained per written requirements that document how to identify and remove equipment that is unserviceable.
- GSE shall be maintained and documented under an aviation maintenance system or other NASA-approved system.
- The maintenance plan detailed in the Center maintenance manual shall include maintenance procedures and technical standards for Aviation Survival Equipment (including life support and ejection seats) for the equipment being flown, which are an integrated function of aircraft maintenance.
- The maintenance plan detailed in the Center maintenance manual shall include a documented program that ensures aircraft maintenance complies with Center Electromagnetic Interference (EMI)/Electrostatic Discharge (ESD) programs.
- The maintenance plan detailed in the Center maintenance manual shall include a Fuel Surveillance Program that ensures fuel is free of contaminants prior to fuel entering any Center aircraft.
- The maintenance plan detailed in the Center maintenance manual shall include a documented program that ensures aircraft maintenance is conducted in compliance with the Center Hazardous Material Program and the Protection of the Environment Act, 40 C.F.R. §§ 260 to 265, which shall include use, disposal, and both long-term and worksite storage of hazardous materials.
- The maintenance plan detailed in the Center maintenance manual shall include an oil analysis program per original equipment manufacturer (OEM) and/or DoD maintenance instructions to identify mechanical breakdown precursors that exist prior to catastrophic failure. The program shall be specific to the type of engine installed and provide trend analysis, immediate feedback, and recommended actions to the Center's Chief of Maintenance.

- The maintenance plan detailed in the Center maintenance manual shall include a documented Weight and Balance (W&B) Program for each aircraft in compliance with any existing Center program.
- The maintenance plan detailed in the Center maintenance manual shall include a configuration control process (CCP) established to determine applicability and ensure compliance with Product Improvement Publications (PIP), which are defined as airworthiness directives, technical orders, service and safety bulletins, or other pertinent requirements including those from FAA, DoD, or OEMs.
- The CCP shall provide a complete audit trail of decisions and design modifications.
- The maintenance plan detailed in the Center maintenance manual shall include a documented aircraft component inspection program to determine the serviceability, authenticity, traceability, and airworthiness of parts, components, accessories, and assemblies by subjecting them to inspections, tests, or operational checks.
- Organizations providing maintenance support to the Center shall have a procurement program to prevent purchasing unapproved parts and material in type certificated products.

6.0 Reliability, Quality, Safety, and Product Assurance

All activities related to aircraft operations are considered high-risk areas at NASA Ames since they involve substantial safety risks and the handling of and exposure to hazardous materials. Quality, safety, and product assurance are therefore of paramount importance. The Contractor shall ensure that all services performed under this SOW comply with the requirements for quality, safety, and product assurance as specified in the contract. The Contractor shall bear full responsibility for obtaining available regulations, updates, newsletters, and other information from applicable regulatory agencies and NASA which pertain to the performance of work outlined in this SOW.

The Contractor shall notify the GFR, the COR and the CO in writing of all issues and concerns, especially with regard to safety or non-compliance with regulations.

Due to the large number of high-risk activities required by this contract and the large number of personnel exposed to those risks, the Contractor shall designate an on-site employee to be responsible for Accident Prevention and Risk Reduction. The Contractor employee shall be experienced and qualified in system safety and hazardous materials handling and will assist the FPB Safety Officer in the performance of their duties.

6.1 Quality System

The Contractor shall be responsible for complying with and supporting the ARC Quality Policy and Quality Management System and shall provide for the integration of applicable procedures into that system.

The Contractor shall interface and coordinate with the NASA ARC Safety, Environmental and Mission Assurance Directorate for defining and implementing safety, reliability, and quality assurance requirements.

In support of CTOs issued, the Contractor shall comply with, and be an integral part of the Ames Management System. This includes following applicable Ames' procedures that are subject to audit. The Contractor shall attend relevant training, provided by the Government, as required

for all on-site employees. Specific procedures will be indicated on each task order response. These procedures include, but are not limited to, the following AMS documents:

NASA Policy Directive, NPD 1280.1A	NASA Integrated Management System Policy
Ames Procedural Requirements, APR 1280.1	Ames Management System (AMS)
NASA Policy Directive, NPD 8730.5B	NASA Quality Assurance Program Policy

The Ames Quality System documents can be found at: <http://ams.arc.nasa.gov>

6.2 Risk Management

The Contractor shall conduct Risk Management procedures in accordance with AFDD Memorandum 95-1, Policies and Procedures for the Operation of Aeroflightdynamics Directorate Research Aircraft.

6.3 Mission Assurance

The Contractor shall develop a Mission Assurance (MA) Plan and submit it to the Ames System Safety and Mission Assurance Office for review and approval. The MA Plan shall cover the following areas:

6.3.1 Inspection and Testing

The Contractor shall perform reliability, quality control, quality assurance, and aircraft hardware inspections for aircraft and aircraft-related equipment. Inspections shall be in conformance with the current revisions of Department of the Army FM 1-500 and TM 1-1500-328-23. Reliability, Quality, Safety, and Product Assurance supervisory responsibility chain shall be independent of the Resident Manager. This will ensure prevention of real or perceived management conflicts in quality assurance.

The Contractor shall implement and maintain a quality control, quality assurance, and aircraft inspection system, which contains but is not limited to:

- Periodic aircraft inspections per Army or applicable agency approved aircraft specific, scheduled and on-condition inspection requirements.
- Pre-flight and post-flight inspections of the aircraft to certify aircraft flight worthy status.
- Inspections and tests, as needed, of all parts, components, and assemblies to ensure conformance to specified dimensions, material, workmanship, finish, construction, weight, interchangeability, identification marking, and if required, functional performance.
- Maintenance, calibration, and operations of Government supplied inspection equipment to ensure conformance of inspected articles to aircraft and engineering specifications.

- Receiving inspection of all incoming items for use on assigned aircraft whether from Ames shops/laboratories or from commercial or Government suppliers.
- Periodic aircraft weighing and the calculation of aircraft center of gravity in accordance with US Army or other appropriate weight and balance directives.
- A method to record and identify in-process Quality Status points to allow manufacturing and test history verification.

In addition, the Contractor shall inspect research project equipment installed in the aircraft. The inspection shall include the interface between experimenters' equipment and the aircraft, restraint of all aircraft mounted equipment, wiring, pressurize systems (pneumatic or hydraulic), heating systems, optical systems, and other areas of potential hazard.

6.3.2 Control of Nonconforming Product and Services

The Contractor shall process nonconforming products and services in accordance with applicable Army procedures and NASA ARC APR 8735.1, *Control of Nonconforming Products and Service*.

6.3.3 GIDEP Alert Reviews

The Contractor shall specify procedures for reviewing and responding to Government/Industry Data Exchange Program (GIDEP) alerts in the MA Plan. The Contractor shall review GIDEP alerts to identify potential impacts on operations. In the event a potential impact is discovered, the Contractor shall notify the COR immediately and submit written notification to the Ames System Safety and Mission Assurance Office. In the event a substandard item is discovered, the Contractor shall notify the COR and the Ames System Safety and Mission Assurance Office for inclusion in the GIDEP.

6.3.4 Records

All records pertaining to safety and quality are Government property and must be complete and available to the Government during the life of the contract. These aircraft records must be retained throughout the period of performance of the contract, unless otherwise directed.

6.3.5 Occupational Safety and Health

The Contractor shall develop a Safety and Health Plan in accordance with the provisions of NASA FAR1852.223-73, *Safety and Health Plan*. The Contractor shall follow all provisions of APR 1700.1, *Ames Health and Safety Manual Procedural Requirements*.

6.3.6 Hazardous Materials Management

The Contractor shall be responsible for hazardous material identification, handling, and record keeping in accordance with applicable standards and regulations, particularly APR 1700.1, APD 8800.4 and NPR 8500.1B. Specific services include, but are not limited to:

- Provision of a point of contact for inspections and inventories
- Monitoring hazardous waste accumulation areas and hazardous waste generation activities
- Ensure all waste barrels are appropriately labeled and disposed
- Provision of a point of contact for spill reporting and spill clean-up

- Maintenance of hazardous material records and other mandated documentation
- Shipping of hazardous materials
- Handling and maintenance of explosive materials

7.0 Training

The training requirements summarized here are applicable to the broad range of specific work areas covered by this contract. The Contractor shall develop and implement a Training Plan to ensure that personnel are adequately trained and qualified to inspect, maintain, repair, and operate the aircraft and associated equipment in accordance with the applicable manufacturer's specifications and Government regulations, and in accordance with established inspection, operation, and maintenance procedures. The Contractor shall provide training for personnel to operate and maintain biological hazard laser and radar tracking systems in accordance with Government and American National Standards Institute (ANSI) procedures. The Contractor shall ensure that all personnel are trained in emergency procedures, as appropriate for each person's specific duties and job assignment. The Contractor shall maintain a file of all personnel qualifications and training records. The Contractor shall also provide specialized training for Contractor and Government personnel within the scope of work of this contract. The term specialized connotes other than routine training to maintain skills necessary for normal or existing operations. Any specialized training will be directed by a CTO.

8.0 Contract Management and Administration

The Contractor shall provide the necessary resources and capability for contract management and administration to meet the requirements in this SOW. The Contractor shall plan, manage, control, and coordinate all work under this contract, including that of subcontracts, in accordance with the contract task orders approved by the Government.

The Contractor shall provide a qualified and experienced management staff to plan, direct, and control all activities conducted under this contract, and to ensure that all tasks are carried out in a competent and timely manner.

The Contractor shall perform the following:

- Manage the contract in a fiscally responsible manner, fulfilling all requirements of negotiated CTOs.
- Provide a well-defined, stable organizational structure with clear lines of authority and clearly identified interfaces to the Government.
- Provide staff with previous training in state-of-the-art information technologies.
- Comply with Government policies and regulations including the Ames Management System (AMS) and relevant AMS policies.
- Manage the resources allocated by NASA and Army for specific tasks in a manner to ensure research goals are reached in accordance with agreed upon milestones.
- Provide a monthly report of the state of all tasks, identifying accomplishments, publications, and major milestones reached as well as problems and concerns over issues that may affect contract performance along with the recommended solutions.
- Provide property management to ensure accountability for installation-provided equipment and facilities and shall be responsible for annual inventory surveys and accountability verification forms.

- Provide the risk management activities that will be used to ensure that the Government has adequate insight into the risks associated with the Contractor's ability to accomplish tasks outlined in any CTO.

8.1 Resource Scheduling

The Contractor shall define, implement, operate and maintain a resource scheduling system for Contractor resources that are allocated for activities performed under this contract. This system will be used to track resources and assist in planning future resources allocation.

8.2 Contract Reporting

The Contractor shall deliver all reports in accordance with Section J.1 (a) Attachment 3, Contract Data Requirements List of this contract. These reports shall be current, accurate, and complete. In addition, the awarded Contract Task Orders (CTO) may include additional specific reporting requirements.

8.3 Property Management

Records will be maintained of all property items, government-provided and acquired charged as a direct cost to the contract. The Contractor users have the responsibility to care, preserve and protect government property, provided or acquired under the contract. Government property is strictly for on-site use unless otherwise authorized by the CO.

The Contractor shall ensure that consumables, equipment, tools, and parts are accounted for, available, and ready when needed.

The Contractor's Property Management shall provide, but not be limited to:

- A property control process that satisfies requirements of the NASA property management database
- A calibration recall process
- A tool checkout system
- A spare parts inventory system

9.0 Phase-In/Phase-Out

This section describes requirements to be fulfilled by the Contractor in order to transition into day-to-day operations after contract award, and requirements for turning over operations at the completion of the contract as described in Section 6.2, Risk Management.

9.1 Phase-In

The phase-in process shall be accomplished as expeditiously as possible, with a maximum phase-in period of 30 days. The phase-in process shall not adversely impact the work being done by the outgoing Contractor. It shall be conducted in a manner consistent with safe operation requirements. The phase-in process shall preclude any interruption of the scheduled operation of facilities. The Contractor shall be responsible for providing a qualified staff with required certifications, or certifications in process, by the end of the phase-in period. The

Contractor shall be responsible for working with NASA as described in this SOW. No later than the end of the phase-in period, the staff of the incoming Contractor shall be fully qualified and certified, or certification procedures begun, to accomplish the requirements of the contract and present a written Status Report to the COR and CO.

9.2 Phase-Out

The Contractor shall submit a Phase-Out Plan as required Attachment J.1 (a) 3, Contract Data Requirements List, Item 15. The Contractor is responsible for the orderly transfer of duties and records, including complete equipment and systems to incoming Contractor or NASA, if there is no successor contract. This shall be accomplished in an expeditious manner, consistent with the phase-in schedule, while minimally impacting ongoing task orders. During Phase-Out, the Contractor shall have transferred all records and documentary material in an orderly manner and vacated all areas of Contractor responsibility, having left them in a clean, professional state and having completed the check-out process.

10.0 Appendix

The Contractor shall follow applicable Government (including State and Local), Army and NASA standards and regulations. Additionally, the Contractor shall comply with applicable health, safety, and environmental protection laws and regulations. For the purposes of this procurement the documents shall be those in effect at the time of contract award; however, if documents are updated the latest versions shall take precedence. The documents listed below apply to the services and associated tasks comprising this SOW. This set is not intended to be comprehensive.

U. S. Army Documents

- Army Regulation 95-1, Aviation Flight Regulations
- Army Regulation 385-95, Army Aviation Accident Prevention
- Army Regulation 95-20, Volume 1, Contractor's Flight and Ground Operations
- Army Regulation 95-20, Volume 2, Government Flight Representative Guidance
- Department of the Army FM 1-500, Army Aviation Maintenance
- Department of the Army TM 1-1500-328-23, Aeronautical Equipment Maintenance Management Policies and Procedures
- Department of the Army TB 43-0002-3, Maintenance Expenditure Limits for Army Aircraft
- Department of the Army Pamphlet 738-751, Functional User's Manual for the Army Maintenance Management System-Aviation
- AFDD Memorandum 95-1, Policies and Procedures for the Operation of Aeroflightdynamics Directorate Research Aircraft

NASA Documents

- NPD 8800.16, NASA Environmental Management
- NPR 7120.5b, NASA Program and Project Management Processes and Requirements
- AMES Management System
- APB 1700.1, Ames Health and Safety Manual
- APG 7910.1, Flight Operations Manual
- APG 8800.3, Ames Environmental Management Handbook
- APD 8800.4, Ames Environmental Programs
- NASA Code Q <http://cmar.arc.nasa.gov/>
- NPR 4200 series Property, Supply and Equipment
- NPD 4100.1B, Supply Support and Material Management Policy
- APD 8800.4, Ames Environmental Programs
- APR 1280.1, Ames Management System Procedural Requirements
- APR 1700.1, Ames Health and Safety Procedural Requirements
- APR 1740.1, Airworthiness and Flight Safety
- APR 7910.1, Flight Operations Manual
- APR 8800.3, Ames Environmental Procedural Requirements
- NASA Code Q <http://cmar.arc.nasa.gov/>
- NPD 4200.1B, Equipment Management
- NPR 4100.1D, NASA Materials Inventory Management Manual
- NPR 4200.1F, NASA Equipment Management Procedural Requirements
- NPR 7120.8, NASA Research and Technology Program and Project Management Requirements
- NPD 8500.1C, NASA Environmental Management
- NPR 7900.3C, Aircraft Operations Management Manual

American National Standard

- American National Standard for the Safe Use of Lasers, ANSI Z136.1-1993

U. S. Federal Codes

- Code of Federal Regulations, Title 29, Occupational Safety and Health Standards (OSHA)
- Code of Federal Regulations, Title 40, Environmental Protection Agency (EPA), Protection of Environment
- Code of Federal Regulations, Title 48, Federal Acquisition Regulations

State of California Codes

- California Health and Safety Code
- California Code of Regulations, Title 8, CAL/OSHA. Division of Industrial Safety
- California Code of Regulations Title 22, California Department of Toxic Substances Control, Hazardous Waste Management

Local Government Documents

- Bay Area Air Quality Management District (BAAQMD), Rules and Regulations
- Santa Clara County Hazardous Materials Storage
- Santa Clara County Hazardous Toxic Gas Storage Ordinance
- Palo Alto Regional Water Quality Control Plant, Waste Water Discharge Requirements
- City of Sunnyvale, Waste Water Discharge Requirements

11.0 Abbreviations and Acronyms

AFDD	U.S. Army - Aeroflightdynamics Directorate
AWO	Aircraft Work Order
AHB	Ames Handbook
ALSE	Aviation Life Support Equipment
AMM	Ames Management Manual
ANSI	American National Standards Institute
APD	Ames Policy Directive
APR	Ames Procedural Requirements
AR	Army Regulation
ARC	Ames Research Center
ATC	Air Traffic Control
AWO	Aircraft Work Order
BAAQMD	Bay Area Air Quality Management District
CAD	Computer Aided Design
CAL/OSHA	California Occupational Safety and Health Administration
CAO	Contract Action Order
CO	Contracting Officer
COR	Contracting Officer's Representative
DOT	Department of Transportation
EPA	Environmental Protection Agency
AR	Federal Acquisition Regulation
FOD	Foreign Object Damage
FPB	Flight Projects Branch
GFE	Government Furnished Equipment
GFR	Government Flight Representative
GSE	Ground Support Equipment
ISO	International Standards Organization
MFA	Moffett Federal Airfield
NASA	National Aeronautics and Space Administration
NEMS	NASA Equipment Management System
NHB	NASA Handbook
NMI	NASA Management Instruction
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
NOTAM	Notices to Airmen
OSHA	Occupational Safety and Health Administration
RA	Resident Agencies
RM	Resident Manager
SOW	Statement of Work
UAS	Unmanned Aerial Systems
ULLS- A	Unit Level Logistics System-Aviation