

PROGRAMS AND PROJECTS SERVICES
FOR
THE PROGRAMS AND PROJECTS DIRECTORATE

DRAFT STATEMENT OF WORK

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Draft Statement of Work - Programs and Projects

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1.0 BACKGROUND

The Programs and Projects Directorate at the National Aeronautics and Space Administration (NASA) Ames Research Center (ARC) conducts and manages programs, projects, and develops missions to support satellite and suborbital platforms.

Engineering Directorate is responsible for developing and launching groundbreaking technology payloads efficiently into space in short time frames. Examples are the Lunar Atmosphere and Dust Environment Explorer (LADEE) and Kepler Programs.

Center Directorate is responsible for the oversight of the Lunar Science Institute (NLSI) and the NASA Astrobiology Institute (NAI) Programs. They also provide engineering research oversight involving human participants and assuring full compliance with federal regulations.

New Ventures and Communications Directorate is responsible for providing new business projects and programs and providing new technology transfer and strategic partnerships with industry, academia and other government agencies.

Science Directorate is responsible for the space science research that includes lunar and planetary studies, earth sciences, and exploration of radiation and other effects of space on living organisms.

Information Technology Directorate is responsible for external projects for developing software modeling such as the NEBULA server, 3D modeling of SpaceComm and Spacewalk/STS 119 projects.

Safety, Environment and Mission Assurance Directorate is responsible for providing oversight of the Ames Management System (AMS) related corrective and preventive action activities.

Aeronautics Directorate is responsible for providing management and administrative oversight as the primary interface between the Aeronautics Research Mission's projects and their work at ARC.

2.0 SCOPE

This Statement of Work (SOW) describes the requirements for providing scientific, engineering, technical, and documentation support for the various areas of programs and projects management work within, but not limited to, the Programs and Projects Directorate at NASA ARC. Examples are Astrobiology Institute Support, International Space Station (ISS) Non-Exploration Projects,

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Lunar Science Institute Programs, NASA Entrepreneurial Initiatives, etc.

This contract requires the Contractor to provide management, personnel, equipment, materials, and facilities (not otherwise provided by the Government) to meet the requirements described in this SOW. This contract requires the Contractor to provide management for the work to be performed, to assure the availability of qualified personnel for timely response to requirements, and to manage all requirements according to the Contractor-provided and Government-approved management plan.

This contract requires the Contractor to provide documentation of program and project activities and results, and resource analysis functions. This requires the Contractor to perform mission, system, and subsystem studies; scientific and technical analyses; systems engineering; preparation and control of technical data and documentation for databases and acquisition documents such as specifications and Statements of Work. This contract requires the Contractor to provide support for the coordination of development efforts by internal and external participants and the planning and performance of hardware and software design development, integration, and testing.

The majority of the work will be performed on-site at NASA ARC with occasional support to be provided at other NASA Centers, Principal Investigator Laboratories, other countries, and at such other locations as directed by the Ames Research Center Contracting Officer under the *Place of Performance* clause listed in Section F of the contract.

3.0 REQUIREMENTS

3.1 INTRODUCTION

The Contractor shall provide program project planning in support of NASA ARC goals and missions. This includes support of proposal preparation and the development of activity schedules, cost and personnel estimates, and management documentation such as program and project plans, work breakdown structures, and procedures. The Contractor shall support NASA ARC program and project integration with other organizations including NASA Headquarters, other NASA field centers, foreign space agencies, science working groups, advisory groups, investigators, and other entities as required.

The Contractor shall be responsible for providing flexible, responsive, coordinated, and comprehensive services that are adjustable within the framework of a series of individual Contract Task Orders (CTOs). The Government will use a task completion oriented CTO as the vehicle to acquire services from the Contractor. Task orders will contain defined requirements (such as deliverables, significant milestone dates), negotiated cost and maximum fee, and established performance measurement criteria. Contract tasks may be

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added, deleted, or modified as agency, directorate, and/or division goals change.

The Contractor shall ensure that planning developed for programs and projects is consistent with budgets, schedules, and facilities.

The Contractor shall identify conflicting needs among but not limited to experiments, payloads, missions, and projects and shall propose solutions. The Contractor shall identify common requirements across projects. The Contractor shall ensure continuity and coordination for the various programs and projects. This shall involve the provision of standardized procedures for implementation and documentation of project goals. The Contractor shall adapt the coordinated schedules to program and project changes as they occur.

The Contractor shall maintain an integrated schedule for each program and project. In the case of mission flights, the Contractor shall maintain a master integrated schedule which tracks mission, payload, and project milestones against actual status. These schedules shall reflect multi-mission goals and objectives. The Contractor shall develop and utilize lower-level schedules for supporting elements and coordinate and track these schedules for compliance with top-level schedules.

3.2 PROGRAM MANAGEMENT

The Contractor shall:

- (a) Develop, prepare, and maintain project work plans, procedures, cost analysis, associated activity charts and schedules, reports, studies, correspondence, and other documents required for effective program, technical, and administrative management of such activities.
- (b) Develop, and implement long term strategies for management of programs.
- (c) Develop, and monitor technical plans and schedules per customer requirements. Perform risk assessment as required.

3.3 PROJECT MANAGEMENT

The Contractor shall:

- (a) Define, prepare, and perform end-to-end technical project development. Perform cost control and risk assessment for each project.

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(b) Provide versatile and adaptable multi-functional project teams to be able to support various projects. This includes science, operations, crew training, hardware development/design, proof of concept design, systems engineering.

3.4 PROJECT SUPPORT

The Contractor shall:

(a) Provide technical expertise for defining, designing, developing, integrating, testing, validating and operating ground and flight platform hardware and software, mission support equipment, laboratories, and facilities.

(b) Plan, design, fabricate, conduct, analyze, and evaluate prototype engineering and scientific experiments to demonstrate the feasibility of various experimental and developmental concepts and recommend novel approaches for such work.

(c) Provide support for all laboratory analyses required in the research and development work, including design, development, fabrication, integration and checkout, maintenance, and update of laboratory equipment and general laboratory instrumentation.

(d) Set up laboratory experiments, obtain test measurements, perform processing and analysis of the acquired data, and present results in technical papers and conference presentations.

(e) Assemble, checkout and, provide logistics, and other project services for off-site operation of equipment for field tests of systems.

(f) Perform data collection, reduction, analysis, and transfer in support of fieldwork, airborne platform missions and systems.

(g) Provide collaborative technology studies and integration.

(h) Keep abreast and follow applicable safety and laboratory regulations and procedures in handling laboratory equipment and hazardous materials. Participate in the development of new procedures when required.

(i) Perform data acquisition, processing, and report preparation.

3.5 PARTNERSHIP, INSTITUTES, AND COLLABORATIVE TECHNOLOGIES

The Contractor shall:

- (a) Provide database solutions and proposal development support that contain information on partnership development and technology transfer. Activities in this area include developing solutions to store and access data, and modification of existing databases, maintenance of databases and data analysis. Proposal Development Support would include Technical Editing, Graphics and Administration of such tasks. As requested by NASA, the Contractor shall provide Contractor support to work with proposal teams in the development and implementation of proposals.
- (b) Provide other assistance, as requested, in the overall support of conferences, workshops and programs. This will include obtaining and distributing workshop materials and accoutrements, setting up and running meeting operations, taking minutes or notes, escorting or driving VIPs, and assembling meeting documents.
- (c) Obtain specialized subcontracting services, as appropriate, to assist in the production of various multi-media end products. The Contractor shall coordinate and administer travel as required.
- (d) Provide science institute support for the NAI Astrobiology, Ames Astrobiology Team, and the Lunar Science programs.
- (e) Identify, develop, and provide potential innovative collaborative technology opportunities between the various business partnership, institute consortiums, and industry. This would include support for website technical development, virtual management, maintaining technical databases including development, maintenance, upgrades, and security controls, appropriate use of Institute resources, yearly assessment of project priorities and progress, review of efficacy processes/procedures, current technologies, and products.
- (f) The Contractor may be required to participate in part or fully in the requirements identification and specification, statement of work development, benchmarking, and other activities associated with Government procurement (i.e., Request for Proposals, Cooperative Agreement Notices, NASA Research Announcements). Participation in defining requirements for future competitions creates a potential conflict of interest.

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3.6 ENGINEERING

The Contractor shall provide systems engineering support. In order to successfully support the development and deployment of ARC projects, expertise will be required in:

- (1) system architecture design
- (2) system configuration definition and implementation
- (3) security requirements during the system design
- (4) integration of project systems
- (5) development and design of laboratories and testbeds for the various technologies
- (6) network management of infrastructure to support project requirements
- (7) setup and configuration of avionics hardware testbed platforms

The Contractor shall develop and monitor technical plans and schedules for engineering design and development requirements. The Contractor shall perform analyses of technical and environmental requirements as specified in individual task order to ensure compliance of hardware fabrication, and to assemble the documentation necessary to ensure usability.

3.7 HARDWARE SYSTEMS ENGINEERING

The Contractor shall develop engineering hardware as part of programs and projects development activities. The Contractor shall support concept definition, requirement definition, design, systems engineering, fabrication, assembly, integration, testing, delivery, maintenance, repair, and refurbishment of hardware and associated software. The Contractor shall provide expertise in:

- (a) Preparing and maintaining schedules for design, development, fabrication, procurement, testing, and installation of hardware.
- (b) Providing cost estimates for design, development, fabrication, and testing of hardware.
- (c) Developing test requirements, plans, protocols, procedures, and schedules for hardware.
- (d) Estimating resource requirements.
- (e) Providing services for defining, performing, and tracking hardware integration and testing (including functional, operations, and interface testing) at ARC and at other hardware integration sites, write procedures, develop pass/fail criteria, train personnel, and implement the tests.

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(f) Developing test schedules and ensuring that the test equipment is in place for testing and evaluation of such hardware at ARC and other sites.

(g) Implementing, tracking, and analyzing hardware tests and resulting data.

(h) Providing all required hardware test documentation, including test results and analyses; analyze and document the resulting data; and develop and document conclusions and recommendations.

(i) Defining and performing studies and tests necessary to substantiate science and engineering requirements and to evaluate the ability of hardware to meet designed use and scientific objectives.

(j) Providing concept definition, requirements definition, design, systems engineering, fabrication, assembly, integration, testing, delivery, field operation, quality analysis, maintenance, and repair for hardware and associated software.

(k) Data processing and analysis, including pre-processing of data, library and database searches, quality control, data archiving, and systems administration.

(l) Fieldwork data collection and logistical support, including processing, transferring, and analyzing data from field or airborne missions.

3.8 SOFTWARE SYSTEMS ENGINEERING

The Contractor shall develop and deploy applications to customers at other NASA Centers, other Federal agencies, and industry. These applications are infusions of technology developed through research. A focus of this area is to apply standard engineering practices to deliver reliable applications, within schedule, and within budget.

The Contractor shall support the ARC objective is to develop missions in less time, at lower cost, and capable of delivering highly useful scientific and technical payloads in order to aid future NASA missions. One of the primary goals is to develop the capability within NASA to have space vehicles that could be deployed faster and cheaper than conventional spacecraft today in order to expand the number of flight opportunities and to take advantage of the latest technologies through shorter development cycles.

3.9 SOFTWARE ENGINEERING

The Contractor shall support Software Engineering objectives. Software engineering is focused on the development and infusion of advanced software engineering tools into NASA missions.

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The Contractor shall provide support of software development and test activities including, but not limited to: monitoring integration, auditing the software development and configuration management processes, participation in software reviews, and systems and software technical interchange meetings.

The Contractor shall notify ARC as to whether open source software will be included in code developed for projects. As required under individual task orders, the Contractor shall include software traceability data linking requirements, design, software, and tests in any required software product documentation.

3.10 SYSTEM SAFETY, RELIABILITY, AND QUALITY ASSURANCE

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:

NPD 1280.1 NASA Management Systems (no longer exist) NPD 1280.1A
NASA Integrated Management System Policy
APR 1280.1 Ames Management System (AMS)
NPD 8730.5 NASA Quality Assurance Program Policy

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

3.11 TECHNICAL TASK SUPPORT

It is anticipated that the Contractor staff shall perform the following functions as required on a per task order basis:

- (1) Collaborate and exchange technical information with the Government research staff in order to meet the requirements of each CTO.
- (2) Provide research support on a task-by-task basis, including direct Research functions and indirect support such as technical and programmatic reviews.
- (3) Provide short turn-around deliverables for specific project milestones as needed and within the time frame outlined in the approved CTO.
- (4) Support technology infusion/deployment efforts with NASA customers.
- (5) Attend and participate in group and project meetings.
- (6) Present research, work in progress, and results to civil service management and at local and international conferences.
- (7) Support (occasionally short-notice) preparations for demonstrations

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and presentations of research, work in progress, and results to visitors and technical delegates, including supporting and/or hosting of technical workshops as needed.

- (8) Travel as needed to conferences, field sites, universities, and other agencies in the performance of research, integration of products, technology infusion, and other important demonstration of results. All foreign travel by Contractors supporting NASA requirements must be documented in country clearance cables to the U.S. State Department. The ARC International Services Office (also known as the International Travel Office, under the auspices of Code JP, *Protective Services*) will draft and submit the cables to the State Department. Contractors will be required to complete an Advance Notice Form (ANF) at least three weeks prior to start of foreign travel.
- (9) Acquire resources (equipment, supplies) needed to support the successful completion of all CTO and related work. See clause H.TBD *Contractor Purchasing* for additional information.
- (10) Provide technical writing and editing for the preparation of technical papers, reports, proposals, and newsletters. The technical expertise shall include word processing, illustrating, and preparation of new text and graphics; editing function for revising and updating documents and coordinating the physical production and distribution of documents.
- (11) Establish and maintain project operational and documentation databases, including requirement traceability.
- (12) Provide web site content development and maintenance, outreach materials, and technology group interface (for developing project requirements and acquiring data).

3.12 MEETINGS, CONFERENCES, ADVOCACY, AND EDUCATIONAL OUTREACH

The Contractor shall provide logistical and administrative support for organizing and coordinating project meetings, activities, conferences, workshops, symposia, science working group meetings, and review committee meetings.

The Contractor shall develop and disseminate mission project information and provide public information services and products for the science and education communities and the general public. The Contractor shall develop web sites and outreach materials such as brochures, videotapes, compact disks, and displays. The Contractor shall coordinate and participate in outreach events. The Contractor shall provide support for local and national science education programs including preparation of K-12 classroom materials.

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3.13 CONTRACT MANAGEMENT AND ADMINISTRATION

The Contractor shall provide overall management and administrative functions to ensure that the proper resources are available and allocated, that required reports and documentation are prepared, and that the overall environment supports 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 CTOs approved by the government. The Contractor shall comply with the contract terms and conditions and work directly with the CO and COTR. The Contractor shall perform the following:

- (1) Manage the contract in a fiscally responsible manner, fulfilling all requirements of negotiated CTOs.
- (2) Provide a well-defined, stable organizational structure with clear lines of authority and clearly identified interfaces to the Government.
- (3) Provide staff with previous training in state-of-the-art information technologies.
- (4) Comply with Government policies and regulations including the Ames Management System (AMS) and relevant AMS policies.
- (5) Manage the resources allocated by NASA for specific tasks in a manner to ensure project and management goals are reached in accordance with agreed upon milestones.
- (6) Provide property management to ensure accountability for installation-provided equipment and facilities and shall be responsible for annual inventory surveys and accountability verification forms.
- (7) 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.

4.0 DOCUMENTATION

The documentation requirements for each task will be included in the Contract Task Order.

4.1 ACRONYMS

| | |
|------|--|
| AMS | Ames Management System |
| ARC | Ames Research Center |
| ASQC | Ames Safety and Quality Control |
| COTR | Contracting Officer's Technical Representative |
| CTO | Contract Task Order |
| JSC | Johnson Space Center |

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5.0 PHASE-IN AND PHASE-OUT

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 incoming Contractor is responsible for providing a qualified Contractor staff by the end of the phase-in period.

Phase-Out:

Upon completion of this contract, the outgoing Contractor is responsible for the orderly transfer of duties and records to the incoming Contractor. This should be accomplished in an expeditious manner, consistent with any contract phase-in schedule, while minimally impacting ongoing task orders. The Contractor shall submit a phase-out plan no later than 60 days before the end of the contract for Government review and approval.