NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Ames Research Center
Computational Sciences Division
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DRAFT
STATEMENT OF WORK
for COMPUTATIONAL SCIENCES RESEARCH AND DEVELOPMENT SERVICES

SEPTEMBER 2004

1.0 INTRODUCTION

The Computational Sciences Division (hereafter, referred to as Code IC or the Division) is part of the Information Sciences and Technology Directorate (Code I) at the NASA Ames Research Center. Code IC conducts scientific research, develops technologies, builds applications, and infuses and deploys advanced information systems technology into NASA missions and other federal government projects. This procurement is for research, development and infusion support services to assist that effort.

The Division is a major contributor to enabling technology research and development of NASA's Advanced Space Technologies (AST) theme programs of NASA's Exploration Systems Enterprise. These Programs are the Computing, Information, and Communications Technology (CICT) program (elements of Intelligent Systems, IT Strategic Research, and Computing, Network and Information Systems) and Engineering for Complex Systems (ECS) program (elements such as Knowledge Engineering, Resilient Systems, and Reliable Software).

This research and development principally supports NASA Exploration Enterprise and mission programs, including Human Robotic Technologies, the Crew Exploration Vehicle, and the Project Prometheus. Other NASA-wide work includes supporting the Astrophysics, Astrobiology, and Planetary Science and Mars Exploration programs for the Space Science Enterprise; Space Shuttle, Space Station and Life Sciences programs for the Space Flight Enterprise; Earth Observing Systems and Distributed Information Systems for the Earth Science Enterprise; Aviation Safety and Security, and Vehicle Systems the Aeronautics Enterprise.

Laboratories are operated by Code IC for many of the scientific and engineering disciplines under the purview of the Division. Code IC maintains strong relationships with other U.S. government agencies, industrial organizations, and academic partners for the purposes of joint research and rapid technology transfer.

Code IC is composed of technology-based groups, each with expertise to support the above-listed missions. The technologies currently emphasized are described in section 2.3 of the Scope of Work that follows. Projects may require participation across multiple technical groups.

The Government will advocate programs, secure funding, determine contract support requirements, issue contractor task orders for work to be

performed, and provide facilities for those contractor personnel who work on-site. The scope of the effort to be performed is described in the following sections. The contract resulting from this RFP will support the Government's Consolidated Contract Initiative (CCI). Consequently, the contractor may be required to perform at locations other than Ames Research Center pursuant to Section F.5 (Place of Performance).

2.0 SCOPE OF WORK

The Contractor shall provide research support in the following technical areas: artificial intelligence (AI), knowledge-based systems, knowledge discovery and data mining, soft computing (including neural networks and fuzzy control methods), nanotechnology information processing and sensors, biologically inspired computer systems and human extensions, prognostic signal analysis, model-based diagnostic reasoning, software fault diagnostic and automated software methodologies, fault-tolerant computing hardware and networking, tele-presence and tele-control of remote, mobile platforms, autonomous and adaptive control, integrated design, human-centered computing, system administration of a distributed heterogeneous network of workstations, and distribution of research information in various formats and forums.

The following descriptions represent the Government’s best effort to project and exemplify research support requirements. Due to the Research and Development nature of Code IC’s missions, the descriptions should not be regarded as definitive representations of future research support requirements.

The contractor shall be responsible for providing a flexible, responsive, coordinated, and comprehensive research mission 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 products and services from the contractor. Task orders will contain defined requirements (such as deliverables, significant milestone dates), negotiated cost baselines, and established performance measurement criteria. Operational procedures to be followed by the Contractor in the task order process are described under Section 3.0 (Contract Task Orders).

The Contractor shall administer all work to be performed under this contract, and assure the availability of qualified personnel for timely response to negotiated CTOs. The contractor shall manage the overall effort in accordance with a management plan that is annually negotiated with and approved by Code IC. Individual task plans shall be negotiated and managed on a per task basis. For each task, technical progress and

resource expenditures shall be reported monthly by the Contractor to the Government. The Contractor will be expected to report results in appropriate technical journals and at conferences and workshops.

2.1 Contract Management

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 research requirements. Overall management and administrative functions to meet the requirements include:

(1) The Contractor shall manage the contract in a fiscally responsible manner, fulfilling all requirements of negotiated CTOs.

(2) The Contractor shall provide a well-defined, stable organizational structure with clear lines of authority and clearly identified interfaces to the Government.

(3) The Contractor shall provide administrative, secretarial and financial services needed to accomplish the work for their employees.

(4) The Contractor shall provide qualified staff in state-of-the-art information technologies.

(5) The Contractor shall comply with Government policies and regulations including the Ames Management System (AMS) and relevant AMS policies (See Section 4.0)

(6) The Contractor shall manage the resources allocated by NASA for specific tasks in a manner to ensure research goals are reached in accordance with agreed upon milestones.

(7) The Contractor shall develop, implement and maintain a discrepancy reporting and tracking system. Discrepancy reports may be issued by the Contractor as well as by NASA regarding technical, resource or financial issues that may prevent meeting milestones or the performance of the task. The system shall assure that all discrepancies are documented and resolved. Discrepancy histories shall be reviewed for indications of systematic or recurring problems for future improvements that require correction.

(8) The Contractor shall 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.

(9) The Contractor shall provide property management to ensure accountability for installation-provided equipment and facilities and shall be responsible for annual inventory surveys and accountability verification forms.

(10) The Contractor shall 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.
(11) The Contractor shall document and obtain concurrence of the NASA Contracting Officer's Technical Representative (COTR) for all deviations, waivers and non-compliance to the requirements of the CTOs.

2.2 Task Management

During the performance of this contract, completion-oriented CTOs will be issued by the Government specifying research to be performed. The task orders will include, at a minimum, information pertaining to the work to be performed, the milestones, and the deliverables. The CTOs shall be returned to the Government by the Contractor with the following information:

(1) A discussion of the technical approach for performing the work, including a risk assessment and any ancillary deliverables defined by the Contractor (if required)
(2) A discussion of how these tasks will be managed, including configuration, subcontracting, schedule, cost control, and the flow of activities from start to completion.
(3) A description of which organizations (both civil servant and contractor) will be involved in each task, and how the interface would be handled.
(4) The risk assessment methods used and a risk mitigation plan that includes de-scoping options
(5) Milestone schedule including termination decision points
(6) Estimate of labor hours and skill mix required to complete the task. Include both straight time and overtime (if authorized) hours, on a monthly basis by applicable labor category, and the total direct labor hours estimated to complete the task.
(7) The total estimated cost and fee for completion of the task order, including:
    a. Labor costs per award fee period and for the entire task
    b. Other direct costs (ODCs) including, but not limited to materials, equipment, travel and subcontracting
    c. Indirect costs
    d. Maximum available award fee for the task

The contractors' task order management shall include the development of a work breakdown structure, cost and schedule estimating and tracking, project requirements development and management, safety/risk

management and methods, configuration management (as necessary) and the participation in and conduct of project reviews.

2.3 Technical Task Support

It is anticipated that the Contractor staff shall perform the following functions as required on a per task 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 required.
(4) Assist in project and deliverable conformance to relevant standards and practices (configuration management, system integration requirements, etc).
(5) Support technology infusion/deployment efforts with NASA customers.
(6) Attend and participate in group and project meetings.
(7) Present research, work in progress, and results to civil service management and at local and international conferences.
(8) Support (occasionally short-notice) preparations for demonstrations and presentations of research, work in progress, and results to visitors and technical delegates, including supporting and/or hosting of technical workshops as needed.
(9) 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.
(10) Acquire resources (equipment, furnishings, supplies) needed to support the successful completion of all CTO and related work.

For revisions in research direction, a Task Order Revision request will be issued to the Contractor in accordance with the procedures outlined in Section 3.0 (Task Orders).

Technology Area 1: System Administration

The Contractor shall be responsible for providing overall computer system administration, network administration and security implementation on systems which will not be covered by NASA's Outsourcing Desktop Initiative (ODIN). There will be existing Government furnished equipment (GFE) as well as new acquisitions and upgrades that make up the

heterogeneous network of workstations and peripherals that must be supported.

Areas in which support is required include:

(1) Planning, requirements definition, and implementation of future upgrades or new acquisitions to support the Division-wide services such as servers (mail, file, print, web, ftp, gopher), printers, security prevention, network improvements, and related software packages
(2) Integration of project or group equipment onto the building network
(3) Laboratories and testbeds used to develop various technologies
(4) Graphics & multimedia development for technology presentations
(5) Security surveillance of network infrastructure and system security plan implementation
(6) Network management over the facility's infrastructure that currently consists of unshielded twisted pair, coaxial, and fiber wiring as well as a local router with a number of subnets
(7) Basic system administration tasks such as upgrades, software installation, definition of standards for various platforms (i.e., unix, linux, mac os, windows NT, windows 98), configuration management, backups, and user training.
(8) Special projects which would include but not limited to: possible deployment of servers and configurations to a customer’s facility to support a technical task or mission, configuration definition to support a technical requirement spanning various agencies, universities and industry, and adherence to the changing requirements of security as it is applied to servers, desktops and the wireless systems.

With the exception of special projects, for which specific requirements will be outlined in a CTO, system administration tasks will be in or nearby the Automation Sciences Research Facility, building N269. Code IC system administration will require coordination with the Division operations manager, the Division computer security official, the Ames backbone manager in Code J, and the center security team.

In addition to any other requirements of this contract, all individuals who perform tasks as a system administrator or have authority to perform tasks normally performed by system administrator shall be required to demonstrate knowledge appropriate to those tasks. This demonstration, referred to as the NASA System Administrator Security Certification, is a NASA funded two-tier assessment to verify that system administrators are able to –

1. Demonstrate knowledge in system administration for the operating systems for which they have responsibility.

2. Demonstrate knowledge in the understanding and application of Network and Internet Security.

Certification is granted upon achieving a score above the certification level on both an Operating System test and the Network and Internet Security Test. The Certification earned under this process will be valid for three years. The criteria for this skills assessment has been established by the NASA Chief Information Officer. The objectives and procedures for this certification can be obtained by contacting the IT Security Awareness and Training Center at (216) 433-2063.

A system administrator is one who provides IT services, network services, files storage, web services, etc. to someone else other than themselves and takes or assumes the responsibility for the security and administrative controls of that service or machine. A lead system administrator has responsibility for information technology security (ITS) for multiple computers or network devises represented within a system; ensuring all devices assigned to them are kept in a secure configuration (patched/mitigated); and ensuring that all other system administrators under their lead understand and perform ITS duties. An individual that has full access or arbitrative rights on a system or machine that is only servicing themselves does not constitute a “system administrator” since they are only providing or accepting responsibility for their system. An individual that is only servicing themselves is not required to obtain a System Administrator Certification.

Technology Area 2: Program Support

The Contractor shall be responsible for communicating knowledge about Information Technology (IT) to non-technical audiences. The group designs, develops and distributes informational products in a wide variety of output formats including written, graphical, electronic, video, audio, multimedia, and live or static demonstrations.

Contractors working within this group shall perform the following tasks:

(1) Outreach (supporting exhibits and material representing research work)
(2) Technical writing and editing
(3) Video production
(4) Multimedia production
(5) Graphics and animation design and production
(6) Web site content development and maintenance
(7) Technology group interface (for developing project requirements and acquiring data)

(8) Accomplishment and highlight reports to line and program management
(9) Compile and update research portfolios for line and program management

Technology Area 3: Automated Learning and Data Mining

The Contractor shall support the objectives of the Automated Learning and Data Mining groups. Such support shall include research, development, and the application of advanced software technology and methods in order to enhance scientific and engineering data analysis, in the support of basic and applied knowledge discovery, and the reduction of operational and lifecycle costs in major NASA Aeronautics and Space Programs. Advanced software technology includes the development of algorithms that support modeling, simulation, collective intelligence, and data mining, analysis and display. Specific support will be in the development and deployment of AI techniques, such as traditional machine learning, learning from partial or incomplete models, Bayesian and other statistical and model-based learning methods.

The Contractor will be required to apply these learning and data mining technologies toward aiding users in extracting a variety of types of information and knowledge from diverse and heterogeneous data-sets, codifying new formal relations between data that act as partial models, and solving problems of large-scale data analysis and optimization.

The main products from this technology area are advanced software tools and applications, applicable to a wide range of internal NASA programs and external activities such as aviation security applications with other national agencies.

Technology Area 4: Automated Software Engineering

The Contractor shall support the objectives of the Automated Software Engineering group. Such support shall include research and development in two principal sub-areas: (a) automated software synthesis and (b) automated verification and validation (V&V).

To support the goals of the automated software synthesis sub-area, The Contractor will provide:

- program synthesis (automated code generation) based on automated logical reasoning
- methods for generating domain-specific code synthesis systems
- adaptive software techniques

- methods for machine assistance towards software reuse

To support the goals of the automated V&V sub-area, the Contractor will provide:

- mathematical approaches to program verification
- software design verification

The main products expected from both sub-areas are advanced software tools. The Contractor shall report research results in appropriate technical journals, and at conferences and workshops.

Technology Area 5: Autonomous Systems and Agents

The Contractor shall support the missions of the Autonomous Systems groups, consisting principally of three main sub-areas: (a) planning and scheduling, (b) model-based diagnosis, and (c) control agent architectures.

The Contractor will be involved in research, develop, and deploy automated reasoning methods and decision support methods for autonomous systems. Such work includes enabling the design, construction, simulation, and operation of a new generation of systems that can act autonomously, as well as in support of humans, while achieving more science return at much lower cost than current approaches. Autonomous systems require developing autonomous control kernels (commanded by high-level, goal-directed behaviors) that are programmable through compositional, common-sense models of hardware and operations behavior. Such systems also require developing on-board automation to close the loop on sensor information at the goal level, using advanced planning, scheduling, execution, diagnosis, and recovery capabilities to ensure that goals are met. Autonomous systems must take action to gain information, assess mission risk, plan contingencies, prepare backup resources, redirect plans to reduce risk, learn from their interactions with their environment, and adapt in real-time. Thus, the Contractor shall perform research and develop distributed coordination and collaboration capabilities that enable autonomous systems to act as teams.

The Contractor shall employ a broad range of Artificial Intelligence (AI) methods such as model-based reasoning and simulation, planning and scheduling, constraint-based reasoning, local and global optimization, decision theory, machine learning, intelligent synthesis, multi-agent coordination, and other innovative or traditional techniques to the missions and tasks. The contractor will provide software development support with state of the art experience in C++, Java and also legacy LISP applications.

Mobilization of these techniques shall support cross-cutting applications efforts so as to satisfy the requirements of such major NASA Enterprises as Space Science, Earth Science, and Human Exploration, Development in Space and Aerospace Technologies.

Technology Area 6: Intelligent Mechanisms and Robotics

The Contractor shall support the missions of the Intelligent Mechanisms Groups, consisting principally of the Robotics Group and the Smart Systems Group, in the development of such applications as: Personal Satellite Assistant, rover vision systems, automated docking systems, smart surgical probes, and software assistants for smart operations and training. The Contractor shall perform the following functions:

(1) Perform engineering analyses of robotic, tele-robotic, semi-autonomous, and autonomous robotic systems and control concepts for NASA missions.
(2) Determine areas where these systems can be employed to provide high leverage returns to NASA missions.
(3) Perform field experiments in the application of these systems to science exploration tasks in unstructured environments.
(4) Support the integration of automated systems, machine vision and perception technologies, and tele-operations, including virtual reality and data visualization graphical computer interfaces.
(5) Conduct applied research with responsibility for technical contribution and leadership, and results or progress demonstration.
(6) Provide electrical and mechanical engineering support on a variety of robotic and intelligent mechanisms.
(7) Support internal development of testbeds and laboratory prototypes.

Technology Area 7: Intelligent Collaboration and Assistant Systems

The Contractor shall support the missions of the Intelligent Collaboration and Assistant Systems groups. The Contractor shall research, develop, and apply methods that provide computer-based support for daily work activities of scientists, engineers, managers, and operational support personnel contributing to major NASA Aeronautics and Space Programs. The team must analyze work environments, technology needs, and communication patterns. They shall design and develop advanced collaboration, communication, and performance support systems, and deliver these on conventional and mobile computing platforms. They shall employ and integrate a broad range of technologies including collaborative systems design, groupware, work systems simulation, information

indexing and retrieval, intelligent interfaces, adaptive systems, wireless technologies, information visualization, intelligent agents, data/information analysis techniques, knowledge-based systems, and other innovative or traditional approaches. They shall focus application efforts so as to satisfy mission requirements in such major NASA Programs as Earth Sciences, Space Sciences, Human Exploration and Development of Space, and Aviation Safety and Security.

A recent example of such an application effort was the development of the Semantic Organizer distributed science and engineering support environment, a computer-supported cooperative work application. Such work involves both science and engineering code development, and the specification, design, development, and integration of codes for use by a science and engineering user community. The task thus includes substantial communication and interfacing with a broad range of users in order to understand the needs that drive development requirements, in addition to the development of the hardware and software systems to support the resultant application.

Technology Area 8: Information Structures and Design

The Contractor shall provide technical support and domain expertise in several areas related to merging information sciences technologies to support aerospace design activities through variational calculus and constrained optimization. These areas currently include:

(1) Develop and implement software for navigation through the aerospace data information infrastructure in support of NASA missions;
(2) Support user interface requirements for launching various versions/scripts of NASA or Industry analyses codes over a distributed information system;
(3) Develop and provide generic versions of distributed interface and database tools as required in support of mission operations and computational and experimental test sources;
(4) Develop and provide analytical systems for use by aircraft and spacecraft designers to evaluate operational impacts of relevant design, operation, maintenance and other life-cycle factor alternatives.

Technology Area 9: Human Centered Computing

The Contractor shall support the objectives of the Human-Centered Computing Group. The Contractor shall develop and apply software tools

for modeling work practices in aerospace domains such as mission control, ground-based vehicle processing, launch control, and air traffic management. These efforts include fundamental innovations and advanced applications of modeling technology, such as the use of work-process models to develop control architectures for human-robot collaboration in planetary exploration.

The Contractor shall support research required to prototype and evaluate a broad range of innovative concepts to meet the requirements for "just-in-time" and remote training systems. The methods used include requirements engineering, graphical interface development, model-based individual and team instruction, and data analysis to track progress and to tailor instructional content. Automated development tools and embedded training/aiding systems are also included in this effort.

The Contractor shall support research and development of advanced scientific, engineering, and operations Knowledge Management Systems, with initial applications to vehicle design and vehicle processing, for example, the development of model-based design methods for life-cycle processing of mixed fleets. The contractor will be involved with innovative modeling activities at ARC as well as collaborative applications and evaluations at other NASA Centers.

Technology Area 10: Aviation Safety & Security

The Contractor shall support the NASA Aviation Safety and Security Program (AvSSP). The AvSSP goal is to develop and demonstrate software and operations technologies that help industry achieve aviation safety improvements and maintain a secure national aerospace environment.

The task includes research and development of data analysis, data modeling, middleware technologies and rapid prototype development of data sharing services. Example technologies developed and applied in safety programs include: aircraft hardware and software safety components, advanced information sharing technologies, improved procedures, training, and tracking and integrated safety models and simulations to better baseline, track and predict aviation safety performance. The deliverables in this task include R&D reports and impact assessments, operations implementation handbooks, and training and test manuals. Documentation includes concept documents, requirements analysis, detailed specifications, on-line code, bug reports and change requests, lessons learned, and test results.

The application work will likely involve sensitive data, and the Contractor will need to support appropriate procedures such as personnel selection, secure data and work environments, and conformance to national ITAR and EAR restrictions.

Technology Area 11: Systems Health and Safety

The Contractor shall support the objectives of the Systems Health and Safety group. The Contractor shall support the development and integration of principles of systems health evaluation and system control into a unified computational framework based on suitable physical, structural and dynamical models. When embodied in operational software, the resulting technology is targeted to exhibit improved system performance on a holistic basis. Research disciplines involved in meeting this objective include the following: experimental statistics, signal analysis, control theory, decision theory, first-principles modeling, structural engineering and computer engineering.

Technology Area 12: Research in Intelligent Vehicle Automation

The Contractor shall support the objectives of the Research in Intelligent Vehicle Automation Group. The Contractor shall support the development and integration of Integrated Vehicle Health Management (IVHM) as applied to spacecraft, airplanes, launch vehicles and other complex systems to gather information about the health of the system and understand the implications of failures. IVHM looks at a vehicle's system during design to optimize sensor selection. Runtime algorithms monitor and diagnose failures of the systems during operation. Intelligent planners can determine actions to recover functionality.

Technology Area 13: Adaptive Control Technologies

The Contractor shall support the objectives of the Adaptive Control Technologies Group. The Contractor shall support the development and integration of intelligent control architectures and other nature-inspired, mathematically sound problem solving tools and methodologies to arrive at a holistic approach that exploits, for a benefit, the order of reality. These architectures will assure safe and reliable operation without large design margins, via reliable sensing, rapid fault detection, isolation and control.

Technology Area 14: Evolvable Systems

The Contractor shall support the objectives of the Evolvable Systems Group. The Contractor shall support the development and integration of

approaches for automatic design of complex electronic, mechanical and nanoscale systems. The group investigates adaptive and evolutionary algorithms that automate the design and optimization of complex space systems and improve reliability. Application areas include spacecraft antennas, programmable logic chips, MEMS devices, and robotic controllers.

Technology Area 15: Smart Systems

The Contractor shall support the objectives of the Smart Systems Group. The Contractor shall support the development and integration of software solutions and tools for space and medicine. Its researchers use adaptive intelligent information technologies to achieve "smart" operation for better performance. Three of its technologies are the robust fault tolerant control of spacecraft navigation and docking, the Intelligent Virtual Station - a software framework that gives astronauts, trainers and flight controllers access to the NASA Johnson Space Center training facility within a virtual environment, and the smart probe - which provides real-time tissue characterization for diagnosis, prognosis and treatment of cancer.

Technology Area 16: Extension of the Human Senses

The Contractor shall support the objectives of the Extension of the Human Senses Group. The Contractor shall support the development and integration of advanced man/machine interfaces, by directly connecting a person to a computer via the human electrical nervous system. The research involves measuring Electromyogram and Electroencephalogram signals and applying intelligent pattern recognition software to interpret these signals as computer control commands. Another important research area for the group is intelligent data understanding, which examines dynamic models for modeling and inferring knowledge from atmospheric observations.

Technology Area 17: Information Physics

The Contractor shall support the objectives of the Information Physics Group. The Contractor shall support the development and integration of physics-based information processing algorithms. The group's research aims to enhance the capabilities of current information processing (i.e., sensing, computing, storage and transmission) algorithms and systems based on knowledge of the underlying physical principles. The focus here is presently on satellite remote sensing of the Earth, as well as the (remote) exploration of other planets and stars. The group also develops

radically new information processing paradigms, enabled by physical principles and technologies at the edge of our understanding and manipulation of Nature. Current investigations are aimed at developing quantum computing techniques and marrying them with nanotechnological devices.

Technology Area 18: Human Factors Research Support

The contractor shall provide support for Human Factors Research efforts. This support will involve the identification, recruitment, and management of Human Test Subjects for various Human Factors studies. In addition the contractor will provide computational support including system and test configuration, data collection (real-time and post hoc), data analysis, development of human-in-the-loop simulation test beds, and computer-based experiments involving human test subjects.

2.4 Additional Task Areas

During the span of this contract, task orders may be written to support similar work within the Information Sciences and Technology Directorate.

Currently, the Division anticipates a transition of several large Computing, Information and Communications Technology (CICT) program elements over the next three years, as program elements such as Intelligent Systems (IS), Information Technology Strategic Research (ITSR), and Computing, Networks and Information Systems (CNIS) elements reach their sunset and new program elements such as Discovery Systems (DS) and Collaborative Decision Systems (CDS) are developed and implemented. In addition, several smaller programs (ECS, AvSSP, etc) may undergo changes as a result of new NASA directives and changes in its missions.

Various new NASA Agency-wide proposed programs such as Mars Science Lab (MSL), Jupiter Icy Moons Orbiter (JIMO), Crew Excursion Vehicle (CEV) and other new human and robotic exploration missions developed to support the President's directives, are anticipated in the near future. Should this be realized, the technologies listed herein would still be applicable, but the scale of effort within the Division could increase or shift significantly, dependent on relevant program decisions (e.g. degree of robotic versus human exploration missions to the moon and/or Mars).

3.0 CONTRACT TASK ORDERS

The task order process follows the steps outlined below:

(1) Civil Servant researcher (task requester) has a requirement and sufficient funding for work to be performed and fills out the "Contract Task Order Request" form.

(2) Request is submitted to the COTR for logging and processing.

(3) COTR submits the request to the Contracting Officer for review.

(4) Once returned by the contracting officer, the COTR works with the contractor management to review and understand the requirements of the request.

(5) Contractor management responds with task plan to the COTR and task requester for approval. There may be rounds of negotiation at this point. Once agreement is made, task order is filled in.

(6) Task order is submitted to the contracting officer for final approval and the contract task order is issued for work to begin.

If any of the requirements (scope, schedule, resources, funding) should change, a CTO revision must be submitted to inform all parties involved (COTR, contractor management, task requester, contracting officer). Changes cannot proceed until final approval from the contracting officer.

For more detailed instructions, please refer to Section H.4, Task Ordering Procedures.

4.0 QUALITY ASSURANCE

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:

NPG 1280.1	NASA Management Systems Policy
APG 1280.1	Ames Management System

AHB 5300.1	System Safety, Reliability and Quality Assurance Manual

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

5.0 HEALTH AND SAFETY

The Contractor shall maintain familiarity with the Ames' Health and Safety Manual AHB 1700-1 and the System Safety, Reliability and Quality Assurance Manual AHB 5300.1. They shall conduct work in accordance with established regulations and with respect for their own and their coworkers' safety. They shall adhere to property safety practices at all times, with particular attention to the procedures for working in and around laboratory equipment. Each contractor employee shall encourage proper safety practices among fellow employees and report any unsafe practices and/or conditions that may exist in employees' work sites to the Contractor Resident Manager or Facility Safety Representative (FSR), who shall report to the COTR. All employees are required to support the requirements of the Voluntary Protection Program (VPP) certification which includes inspections, training and reporting.

6.0 DELIVERABLES

Products and services requirements shall be defined in each task order.

7.0 STANDARDS

The Contractor's policies and plans for management and performance of this contract must be tailored to the NASA Environment. The contractor's standards, policies, and plans must provide flexibility to react to changing policies, standards, technology and methodology and must conform to NASA Standards and Guidelines.

8.0 SECTION 508 OF THE REHABILITATION ACT REQUIREMENTS

This procurement may contain requirements for products/services subject to Section 508 of the Rehabilitation Act, Electronic and Information

Technology (EIT) Accessibility. Section 508 requirements will be identified in the individual CTOs. Complete information on Section 508 and EIT accessibility is available via Internet at http://www.section508.gov.

Offerors must propose EIT products and/or services that meet the applicable accessibility standards identified below.

36 CFR 1194.21	Software applications and operating systems
36 CFR 1194.22	Web-based intranet and internet information and applications
36 CFR 1194.23	Telecommunications products
36 CFR 1194.24	Video and multimedia products
36 CFR 1194.25	Self contained, closed products
36 CFR 1194.26	Desktop and portable computers
36 CFR 1194.31	Functional performance criteria
36 CFR 1194.41	Information, documentation and support

Appendix A Acronyms

AI	Artificial Intelligence
ARC	Ames Research Center
ASTT	Aeronautics and Space Transportation Technology (Enterprise)
AvSSP	Aviation Safety and Security Program
BEES	Bio-inspired Engineering of Exploration Systems
CAD	Computer Aided Design
CBM	Condition Based Maintenance
CCI	Consolidated Contract Initiative
CDS	Collaborative Decision Systems
CICT	Computing, Information, and Communication Technologies (Program)
CNIS	Computing, Networks and Information Systems (part of CICT)
CO	Contracting Officer
COTR	Contracting Officer's Technical Representative
CTO	Contract Task Orders
DS	Discovery Systems
EAR	Export Administration Regulation
ECS	Engineering for Complex Systems (Program)
FSR	Facility Safety Representative
GFE	Government Furnished Equipment
GRC	Glenn Research Center at Lewis Field
GUI	Graphic User Interface
HEDS	Human Exploration and Development of Space (Enterprise)
HUMS	Health and Usage Monitoring System
ICS	Intelligent Computational Systems
IS	Intelligent Systems (part of CICT)
ITAR	International Traffic in Arms Regulation
ITSR	Information Technology Strategic Research (part of CICT)
IVHM	Integrated Vehicle Health Management
MSM	Mission Science and Measurement (ASTT Enterprise theme)
MTPE	Mission to Planet Earth (Enterprise)
ODC	Other Direct Cost
ODIN	Outsourcing Desktop Initiative for NASA
QA	Quality Assurance
RLV	Re-usable Launch Vehicle
SOFIA	Stratospheric Observatory For Infrared Astronomy
SSE	Space Science Enterprise (Enterprise)
UAV	Unmanned Aerial Vehicle
V&V	Verification & Validation