In the spirit of the Federal Acquisition Streamlining Act NASA LANGLEY RESEARCH CENTER and ANALYTICAL MECHANICS ASSOCIATES, INC. enter into a cooperative agreement to further reduce the administrative costs of acquiring commercial items from the General Services Administration (GSA) Federal Supply Schedule Contract GS-23F-0047L.

Federal Supply Schedule contract BPAs eliminate contracting and open market costs such as: the search for sources; the development of technical documents and solicitations; and the evaluation of bids and offers. Contractor Team Arrangements are permitted with Federal Supply Schedule contractors in accordance with Federal Acquisition Regulation (FAR) Subpart 9.6.

This BPA will further decrease costs, reduce paperwork and save time by eliminating the need for repetitive, individual purchases from the Schedule contract. The end result is to create a purchasing mechanism for the Government that works better and costs less.

Signatures:

_________________________________________  __________  ____________________________________________
DARLA J. CLIFTON                         DATE                          ANURADHA BEDI                          DATE
Contracting Officer                      Contracts Manager

Revised 6/2000
BPA NUMBER NNL04AA03Z

NASA Langley Research Center
BLANKET PURCHASE AGREEMENT

Pursuant to GSA Federal Supply Schedule Contract Number GS-23F-0047L, Blanket Purchase Agreements, the Contractor agrees to the following terms of a Blanket Purchase Agreement (BPA) EXCLUSIVELY WITH NASA Langley Research Center (NASA Langley Research Center Terms and Conditions are included as Attachment 1 and the Statement of Work is incorporated as Attachment 2):

(1) The following contract services/products can be ordered under this BPA. All orders placed against this BPA are subject to the terms and conditions of the GSA contract, except as noted below:

<table>
<thead>
<tr>
<th>CONTRACT SERVICES/PRODUCTS</th>
<th>SPECIAL BPA DISCOUNT/PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYSTEM DESIGN, ENGINEERING, AND INTEGRATION</td>
<td>PRICING IN ACCORDANCE WITH THE GSA</td>
</tr>
<tr>
<td>OF THE PROFESSIONAL ENGINEERING SERVICES (PES)</td>
<td>SCHEDULE, WITH ADDITIONAL DISCOUNT OF</td>
</tr>
<tr>
<td>GENERAL SERVICES ADMINISTRATION (GSA) SCHEDULE</td>
<td>5% TO THE LABOR CATEGORY OF PROJECT</td>
</tr>
<tr>
<td></td>
<td>ENGINEER. (ADDITIONAL SPOT DISCOUNTS</td>
</tr>
<tr>
<td></td>
<td>ARE AUTHORIZED, AND WILL BE SPECIFIED</td>
</tr>
<tr>
<td></td>
<td>ON THE INDIVIDUAL TASK ORDERS).</td>
</tr>
</tbody>
</table>

(2) Delivery:

<table>
<thead>
<tr>
<th>DESTINATION</th>
<th>DELIVERY SCHEDULE/DATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS SPECIFIED ON INDIVIDUAL TASK ORDERS</td>
<td>AS SPECIFIED ON INDIVIDUAL TASK ORDERS</td>
</tr>
</tbody>
</table>

(3) The Government estimates, but does not guarantee, that the volume of purchases on this agreement (single award) will be $20,000,000.00.

(4) This BPA does not obligate any funds.

(5) This BPA expires on April 1, 2009, or at the end of the GSA contract period, whichever is earlier.

(6) The following office(s) is hereby authorized to place orders under this BPA:

<table>
<thead>
<tr>
<th>OFFICE</th>
<th>POINT OF CONTACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>NASA Langley Research Center</td>
<td>AUTHORIZED CONTRACTING OFFICERS</td>
</tr>
</tbody>
</table>

(7) Orders will be placed against this BPA via Electronic Data Interchange (EDI), FAX, paper, or oral communications.

(8) Unless otherwise agreed to, all deliveries under this BPA must be accompanied by delivery tickets or sales slips that must contain the following information as a minimum:

- (a) Name of Contractor;
- (b) Contract Number;
- (c) BPA Number;
- (d) Task Order Number;
- (e) Quantity, Unit Price, and Extension of Each Item (unit prices and extensions need not be shown when incompatible with the use of automated systems; provided, that the invoice is itemized to show the information); and
- (f) Period of Performance.

(9) The requirements of a proper invoice are as specified in the Federal Supply Schedule contract. Invoices will be submitted to the address specified within the task/delivery order transmission issued against this BPA.

(10) The terms and conditions included in this BPA apply to all purchases made pursuant to it. In the event of an inconsistency between the provisions of this BPA and the Contractor's invoice, the provisions of this BPA will take precedence.

*IMPORTANT -- A new feature to the Federal Supply Schedules Program permits contractors to offer price reductions in accordance with commercial practice. Contractor Team Arrangements are permitted with Federal Supply Schedule contractors in accordance with FAR Subpart 9.6.

Revised 6/2000
NASA FAR SUPPLEMENT CLAUSES

NFS 1852.209-71 LIMITATION OF FUTURE CONTRACTING (DECEMBER 1988)

(a) The Contracting Officer has determined that this acquisition may give rise to a potential organizational conflict of interest. Accordingly, the attention of prospective offerors is invited to FAR Subpart 9.5—Organizational Conflicts of Interest.

(b) The nature of this conflict is development of NASA architectures and roadmaps, identified in the Statement of Work (SOW) Task 1, may lead to solicitations for which the contractor may be limited by (c)(1) below. Further, Independent assessment associated with SOW Task 4, involves review of competition sensitive and proprietary material, which shall require a non-disclosure agreement as described in (c)(2) below.

(c) The restrictions upon future contracting are as follows:

(1) If the Contractor, under the terms of this contract, or through the performance of tasks pursuant to this contract, is required to develop specifications or statements of work that are to be incorporated into a solicitation, the Contractor shall be ineligible to perform the work described in that solicitation as a prime or first-tier subcontractor under an ensuing NASA contract. This restriction shall remain in effect for a reasonable time, as agreed to by the Contracting Officer and the Contractor, sufficient to avoid unfair competitive advantage or potential bias (this time shall in no case be less than the duration of the initial production contract). NASA shall not unilaterally require the Contractor to prepare such specifications or statements of work under this contract.

(2) To the extent that the work under this contract requires access to proprietary, business confidential, or financial data of other companies, and as long as these data remain proprietary or confidential, the Contractor shall protect these data from unauthorized use and disclosure and agrees not to use them to compete with those other companies.

(End of clause)

NASA LANGLEY RESEARCH CENTER CLAUSES

1. DELIVERY INSTRUCTIONS

Deliveries must be made to the “Ship To” address as specified in this order. Vendor deliveries will be accepted only during normal operating hours which are from 7:00 a.m. to 3:30 p.m., daily except Saturdays, Sundays and Legal Holidays. Any exceptions to the normal delivery will be clearly defined by the NASA Contracting Officer.

2. (LIMITED) RELEASE OF CONTRACTOR CONFIDENTIAL BUSINESS INFORMATION (CBI) (LaRC 52.204-104) (JAN 2002)

(a) NASA may find it necessary to release information submitted by the Contractor, either in response to this solicitation or pursuant to the provisions of this contract, to individuals not employed by NASA. Business information that would ordinarily be entitled to confidential treatment may be included in the information released to these individuals. Accordingly, by submission of this proposal, or signature on this contract or other contracts, the Contractor hereby consents to a limited release of its Confidential Business Information (CBI).

(b) Possible circumstances where the Agency may release the Contractor's CBI include, but are not limited to, the following:

(1) To other Agency contractors and subcontractors, and their employees tasked with assisting the Agency in handling and processing information and documents in the evaluation, the award or the administration of Agency contracts, such as providing both preaward and post award audit support and specialized technical support to NASA's technical evaluation panels;

(2) To NASA contractors and subcontractors, and their employees engaged in information systems analysis, development, operation, and maintenance, including performing data processing and management functions for the Agency.
(c) NASA recognizes its obligation to protect the contractor from competitive harm that could result from the release of such information to a competitor. Except where otherwise provided by law, NASA will permit the limited release of CBI under subparagraphs (1) or (2) only pursuant to non-disclosure agreements signed by the assisting contractor or subcontractor, and their individual employees who may require access to the CBI to perform the assisting contract.

(d) NASA’s responsibilities under the Freedom of Information Act are not affected by this clause.

(e) The Contractor agrees to include this clause, including this paragraph (e), in all subcontracts at all levels awarded pursuant to this contract that require the furnishing of CBI by the subcontractor.

3. SECURITY PROGRAM/NON-U.S. CITIZEN EMPLOYEE ACCESS REQUIREMENTS (LaRC 52.204-91) (OCT 2003)

(a) Access to the LaRC by contractor non-U.S. Citizen employees, Including employees in permanent resident alien status, shall be Approved in accordance with NPG 1371.2 and lms-cp-4850-- "non-U.S. Citizen(s)/foreign representative(s) visitor approval”. Administrative processing requires advance notice of between 20 To 45 days depending on the nationality of the non-U.S. Citizen. Access authorization shall be for a maximum of one year, and must be reevaluated annually. Non-U.S. Citizen employees must be under escort at all times while on Center by a U.S. citizen issued a LaRC identification badge.

(b) Request for Center access in excess of 90 days requires that a background investigation be conducted on the non-U.S. citizen employee. The processing of a background investigation requires the submittal of a NASA Form 531, "Name Check Request," and a fingerprint card application. Normal processing time for a background investigation is approximately 90 days. A favorably adjudicated background investigation shall allow non-U.S. citizen contractor employee limited unescorted access to the Center. Access shall be limited to work areas identified and deemed necessary and entry and egress to that site.

4. UNESCORTED ACCESS BY U.S CITIZEN CONTRACTOR EMPLOYEES (LaRC 52.204-102) (NOV 2002)

Visits by U.S. citizen contractor employees that are expected will exceed 90 days will require the employee to undergo a Background Investigation. All Contractor employees must, as a minimum, have a favorably adjudicated NASA Agency Check (NAC). However, a NAC is not required if the Contractor can certify that an employee has an active United States Government Security Clearance, (IAW requirements of Executive Order #12968), or has been the subject of a prior favorable NAC investigation.

For contractor employees requiring a NAC, the Contractor shall require its employees to submit a "Name Check Request" (NASA Form 531), an "Authorization for Release of Credit Reports" (NASA Form 1684), and a completed FD-258, " Applicant Fingerprint Card" to the LaRC Badge and Pass Office, Mail Stop 232. Fingerprint cards will be completed at the Badge and Pass Office only. Normal processing time for a NASA NAC is approximately 60 days.

5. OBSERVATION OF REGULATIONS AND IDENTIFICATION OF CONTRACTOR’S EMPLOYEES (LaRC 52.211-104) (APR 2002)

(a) Observation of Regulations--In performance of that part of the contract work which may be performed at Langley Research Center or other Government installation, the Contractor shall require its employees to observe the rules and regulations as prescribed by the authorities at Langley Research Center or other installation including all applicable Federal, NASA and Langley safety, health, environmental and security regulations.

(b) Identification Badges--At all times while on LaRC property, the Contractor shall require its employees, subcontractors and agents to wear badges which will be issued by the NASA LaRC Badge and Pass Office, located at 1 Langley Boulevard (Building No. 1228). Badges shall be issued only between the hours of 6:30
a.m. and 3:30 p.m., Monday through Friday. Contractors will be held accountable for these badges, and may be required to validate outstanding badges on an annual basis with the NASA LaRC Security Office. Immediately upon employee termination or contract completion, badges shall be returned to the NASA LaRC Badge and Pass Office. It is agreed and understood that all NASA identification badges remain the property of NASA and the Government reserves the right to invalidate such badges at any time.

(c) Employee Outprocessing--The Contractor shall ensure that all employees who are terminated or no longer connected with work being performed under this contract are out processed through the LaRC Badge and Pass Office. Badges and keys must be accounted for and returned.
STATEMENT OF WORK
BLANKET PURCHASE AGREEMENT
FOR
THE DEVELOPMENT AND ASSESSMENT OF AEROSPACE ARCHITECTURES, ROADMAPS,
MISSIONS, AND TECHNOLOGIES

1. **BACKGROUND:** This Statement of Work provides support to NASA Langley Research Center (LaRC) Aerospace Systems Concepts and Analysis Competency (ASCAC) employees involved in the development, implementation, and application of advanced methods in the development and assessment of aerospace architectures, roadmaps, missions, and technology. The scope of the solicited support is necessarily broad to encompass the areas of analytical expertise offered by ASCAC, which includes aerodynamics, planetary entry, astrodynamics, systems analysis, and optimization. In addition to a broad expertise base, the contractor is expected to provide a vertically integrated capability that spans conceptual design, detailed analysis, comprehensive assessment, and advanced visualizations. In order to fulfill these ongoing requirements, the Government anticipates a single award Best Value Blanket Purchase Agreement (BPA) using Special Item Number (SIN) 871-3, System Design, Engineering and Integration, of the Professional Engineering Services (PES) General Services Administration (GSA) Schedule.

2. **REFERENCE:** This BPA is subject to GSA Schedule GS-23F-0047L.

3. **OBJECTIVE:**
   
a. The contractor shall develop and provide products and services designed to meet the needs of unique project and program teams under the direction of LaRC ASCAC and its partners at NASA Headquarters, other NASA Centers, LaRC, academia, and industry. Such support shall require a contract team with adaptable and significant expertise in, but not limited to, aerodynamics, launch systems, planetary entry, space system design, systems analysis, astrodynamics, technology assessment, structural analysis, multidisciplinary optimization, and advanced 3D modeling and dynamic visualization.

b. The contractor shall work openly and collaboratively with a team representing partners from different organizations and disciplines. All products, materials, and services developed during the period of performance of this contract shall be government property. All work conducted as part of this contract shall carry only the NASA logo unless otherwise negotiated.

4. **SCOPE OF WORK:**

**Task 1 – Architecture and Roadmap Development.** ASCAC develops and delivers advanced concepts, systems analyses, and multidisciplinary methods that enable programs to meet objectives and that enable the Agency to develop future aerospace technologies. Given that the horizon for these efforts extends from 10 years to over 50, knowledge of and the ability to develop, as well as assess enabling/enhancing future technologies and concepts is fundamental to this task.

**Task 2 – Mission Development.** ASCAC has provided and continues to provide critical concept/proposal development and mission support to LaRC and Agency efforts, including 2001 Mars Odyssey, Aerial Regional-scale Environmental Survey of Mars mission (ARES), Gravity Recovery and Climate Mission Objective (GRACE), Cloud-Aerosol Lidar and Infrared Pathfinder Satellite (CALIPSO), and Geosynchronous Imaging Fourier Transform Spectrometer (GIFTS). Future sub-tasks are expected to encompass one or more phases of development including pre Phase A concept studies/requirements definition, Phase A
definition and technology studies, Phase B detailed design studies, Phase C/D design and development, and Phase E operations. Broad based expertise in multiple disciplines will be required to support this task.

**Task 3 – Technology Development.** ASCAC performs substantive base research in the development of new technologies. This requires the application and extension of existing methodologies as well as the development of fundamentally new capabilities in response to unique analytical challenges. Contractor support is required for the investigation and development of technologies required for, but not limited to, advanced launch systems, planetary aerocapture and entry techniques, planetary science platforms (flyers, rovers, sub-surface vehicles, etc.), propulsion systems, communications, and flight vehicle systems.

**Task 4 – Independent Assessments.** ASCAC is often required to produce independent trade studies and systems analyses for a wide range of flight, launch, Earth orbiting, Heliocentric, and planetary aerospace architectures, missions, and technologies. Many of these studies and assessments are high-priority, short duration efforts in response to inquiries from NASA Headquarters and Agency reviews. The contractor shall provide technical expertise and consulting across a range of disciplines to provide input for, and enhancement of analysis software and methods used in aerospace systems studies. Note that the nature of many sub-tasks will require addressing potential Organizational Conflict of Interest (OCOI) issues.

**Task 5 – Advanced Engineering Environments.** LaRC ASCAC has a distinguished history in the development of comprehensive state of the art engineering environments and methods that enable/enhance activities that range from the design and assessment of conceptual architectures to Conceptual Design Review (CDR) level subsystem level performance predictions. The contractor shall provide support in the continuing development of existing tools and environments as well as active participation in the genesis of fundamentally new capabilities.

5. **DATA / DELIVERABLES:**

   a. All documents, materials, processes and strategies under this contract shall comply with contract and task order requirements. Where printed deliverables are required, deliverables shall be provided both in paper hardcopy and electronic media formats (including the Internet, i.e., html compatible formats) as determined by the government. Hardcopy shall be available in camera-ready quality. All software must be compatible with software and hardware used by Langley Research Center. The individual task order statement of work will specify the title, frequency/due date, and format for each deliverable.

   b. The contractor shall be responsible for postage costs for all required mailings. The contractor shall be responsible for ensuring timely delivery of the items to the specific destinations regardless of the delivery method.

   c. The contractor shall keep the Contracting Officer’s Technical Representative (COTR), informed of task status and progress by regular correspondence or meetings.

6. **GOVERNMENT FURNISHED EQUIPMENT / INFORMATION:**

   a. The Government will provide the following base support: Government-controlled equipment or other support, which the Government determines can be made available at, or through any NASA installation where this contract will be performed. The Government
will furnish or make available to the contractor any documentation deemed necessary by the Government to accomplish this task.

b. Other Government furnished equipment/information will be listed on individual task orders, if applicable.

7. **CONTRACT MANAGEMENT:**

   a. **Contracting Officer’s Technical Representative:** The following individuals will perform duties as a COTR:
      Primary: Washito A. Sasamoto, Mail Stop 328, Hampton, VA 23681; (757) 864-1923.
      Alternate: John G. Martin, Mail Stop 365, Hampton, VA 23681; (757) 864-3755.

   b. **Technical Monitor:** The technical monitor will be identified on individual task orders.

   c. **Contract Administrator:** The following individual will perform duties as a Contract Administrator: Darla Clifton, Mail Stop 126, Hampton, VA 23681; (757) 864-4577.

8. **TRAVEL:** Vicinity travel is not authorized. Reimbursable travel will be identified on individual task orders if applicable. For orders authorizing reimbursable travel, the Contracting Officer or a designated Government official will approve each trip in advance. The Contractor shall provide documentation with each invoice that travel and per diem invoiced is in accordance with the items and rates allowable under the Federal Travel Regulation (FTR) for reimbursement to Federal employees and in accordance with FAR 31.205-46.

9. **SECURITY:** Security requirements will be stated in each individual task order. A DD 254 will be completed for individual tasks if applicable.

10. **DUTY INFORMATION:**

    a. **Place of Performance:** The place of performance will generally be either on NASA Langley Research Center, Hampton, Virginia or at another facility in the local area. However, some tasks may require performance at other locations. The place of performance will be identified in the individual task order statement of work.

    b. **Period of Performance:** The BPA shall expire 5 years from date of award, or at the end of the GSA contract period, whichever is earlier. The period of performance for individual tasks will be included on the task order Statement of Work.

    c. **Duty Hours:** The duty hours will be included on the individual task order Statement of Work.