

ORDER FOR SUPPLIES OR SERVICES

PAGE 1 OF 8 PAGES

IMPORTANT: Mark all packages and papers with contract and/or order numbers.

| | | | | | | |
|--|--|--|-----------------------------|---|----------------------------------|--------------------|
| 1. DATE OF ORDER January 21, 2006 | | 2. CONTRACT NO. (if any) NNL05AA01B | | 6. SHIP TO: | | |
| 3. ORDER NO. Task Order NNL06AA77T | | 4. REQUISITION/REFERENCE NO. See Block 9 | | a. NAME OF CONSIGNEE NASA Langley Research Center | | |
| 5. ISSUING OFFICE (Address correspondence to) SEE BLOCK 6 (ATTN: Darla Clifton, 757-864-5717) (FAX: 757-864-7709) | | | | b. STREET ADDRESS 9A Langley Boulevard | | |
| 7. TO: | | c. CITY Hampton | | d. STATE VA | e. ZIP CODE 23681-2199 | |
| a. NAME OF CONTRACTOR ATTN: [REDACTED] | | | | f. SHIP VIA | | |
| b. COMPANY NAME Science Applications International Corporation | | | | 8. TYPE OF ORDER | | |
| c. STREET ADDRESS 10260 Campus Point Drive | | | | <input type="checkbox"/> a. PURCHASE | | |
| d. CITY San Diego | | e. STATE CA | f. ZIP CODE 92121 | REFERENCE YOUR: Please furnish the following on the terms and conditions specified on both sides of this order and on the attached sheet, if any, including delivery as indicated. | | |
| 9. ACCOUNTING AND APPROPRIATION DATA PR 4200142218 \$80,000.00 (COMPLETE) | | | | 10. REQUISITIONING OFFICE NASA Langley Research Center | | |
| 11. BUSINESS CLASSIFICATION (Check appropriate box(es)) | | | | 12. F.O.B. POINT | | |
| <input type="checkbox"/> a. SMALL <input type="checkbox"/> d. WOMEN-OWNED <input checked="" type="checkbox"/> b. OTHER THAN SMALL <input type="checkbox"/> e. HUBZone <input type="checkbox"/> c. DISADVANTAGED <input type="checkbox"/> f. EMERGING SMALL BUSINESS <input type="checkbox"/> g. SERVICE DISABLED VETERAN-OWNED | | | | Destination | | |
| 13. PLACE OF | | 14. GOVERNMENT B/L NO. | | 15. DELIVER TO F.O.B. POINT ON | | 16. DISCOUNT TERMS |
| a. INSPECTION NASA LaRC | | b. ACCEPTANCE NASA LaRC | | OR BEFORE (Date) January 20, 2007 | | NET 30 |

17. SCHEDULE (See reverse for Rejections)

| ITEM NO. (a) | SUPPLIES OR SERVICES (b) | QUANTITY ORDERED (c) | UNIT (d) | UNIT PRICE (e) | AMOUNT (f) | QUANTITY ACCEPTED (g) |
|--|---|---------------------------|-------------|--|-----------------------------|-------------------------------|
| 0001 | Task Order entitled "NASA Engineering and Safety Center (NESC)" in accordance with the attached Task Order Statement of Work and the Contractor's proposal dated 1/18/2006. *NOTE: This Task Order is subject to FAR 52.232-22 - Limitation of Funds. The Contractor is only authorized to incur up to the cost limitation set forth in NFS 1852.232-81 on Page 7. | 1 | JOB | Estimated Cost Fixed Fee *Total Cost-Plus-Fixed Fee | [REDACTED] \$727,164 | |
| 18. SHIPPING POINT | | 19. GROSS SHIPPING WEIGHT | | 20. INVOICE NO. | | 17(h) TOT. ← (Cont. pages) |
| 21. MAIL INVOICE TO: | | | | | | |
| a. NAME ***SEE PARAGRAPH G.2 OF THE BASIC CONTRACT*** | | | | | | 17(i) ← GRAND TOTAL |
| b. STREET ADDRESS (or P.O. Box) | | | | | | |
| c. CITY | | d. STATE | e. ZIP CODE | | | |
| 22. UNITED STATES OF AMERICA BY (Signature) <i>Darla J Clifton</i> | | | | 23. NAME (Typed) DARLA J. CLIFTON TITLE: CONTRACTING/ORDERING OFFICER | | |

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OPTIONAL FORM 347 (REV. 3/2005)
Prescribed by GSA/FAR 48 CFR 53.213(a)

**Science Applications International Corporation (SAIC)
Contract NNL05AA01B
Task Order Statement of Work**

1. **Task Order Title:** NESC Support to Crew Exploration Vehicle (CEV) Project
2. **Reference:** This requirement is pursuant to contract NNL05AA01B, between NASA Langley Research Center and Science Applications International Corporation. Refer to Paragraph 3.0, Proposal and Mission Concept Evaluations of the basic contract Statement of Work.
3. **Purpose, Objective, and Background of Work to be Performed:** NASA is currently undergoing a transformation to manage the work ahead in pursuit of the President's Vision for Space Exploration. The Administrator desires to rekindle the Agency's capacity to be "good stewards" of the design, development, test, and evaluation process in support of future flight systems. To that end, the Agency must develop the "self-knowledge" of our strengths and weaknesses within NASA. The NESC is currently supporting this effort through the following activities and has identified requirements for subject matter experts in support of these activities.
 - 3.1 At the request of the Administrator, the NESC has initiated an intra-agency team to develop an independent design for the CEV including the Command Module, Service Module, and the Launch Abort System. This independent design will be used by the CEV Project and the CEV Source Selection team to assist in the evaluation of contractor proposals. This will allow substantial agency-wide penetration into the design challenges faced with the CEV procurement providing opportunities for our Agency team to better assess competing bids from our commercial responders. The team will brainstorm, prioritize and complete the trade studies, design improvements and additional design details needed to ensure the final product is an innovative approach for a CEV design. In support of this task, a number of Subsystem Design Teams will be formed.

The contractor shall participate as a member of the CEV Smart Buyer Design Process Subteam by providing expert consultations and lessons learned based on their experiences from Apollo era programs. The contractor will participate in the brainstorming sessions to identify possible design improvements, necessary trade studies, and critical subsystems that warrant additional design detail. The contractor will participate in the evaluation and prioritization of design work. Once the prioritized list of design improvements and trade studies has been determined, the corresponding Subsystem Design Teams will be established to complete the necessary design work.
 - 3.2 The NESC will also be providing support to ongoing CEV activities at the request of the Exploration Sciences Mission Directorate and will require senior-level consulting in support of these activities which are yet to be determined.

- 3.3 Recent activities, particularly exploration initiatives, within the agency have renewed interest in "best practices" for designing reliable spacecraft systems. The NESC has been requested to study and report out on design and verification methodologies for maximizing and assessing critical spacecraft system reliability. The objective of this Reliability of Critical Spacecraft Systems assessment is to bring reliability subject matter experts, subsystem/discipline/domain experts and systems engineering experts together to synthesize the current "best practices" in critical spacecraft system reliability. The activity will not only address the design element of reliability, but will also investigate other key facets integral to system reliability, such as, test and verification methodologies for demonstration of reliability and appropriate tools for the assessment and quantification of system reliability.

The Contractor shall support efforts to integrate and document "Best Practice" aspects of designing, verifying and quantifying the reliability of spacecraft systems. The scope will require data on historical system performance, lessons learned from previous efforts and benchmarking outside the agency on organizations and programs with responsibilities for safety of comparable or greater magnitude. Historical systems will include both heritage NASA systems and other critical systems as applicable (e.g., military, commercial aerospace, etc.). Lessons learned will span formal agency lessons learned databases, as well as corporate knowledge from agency experts. Other high reliability organizations outside of NASA will be benchmarked to measure and challenge our design, test and assessment methodologies. The scope will encompass several critical subsystems and disciplines including:

- Structures
- Avionics
- Software
- Guidance, Navigation and Control
- Propulsion
- Life Support and Active Thermal Control
- Mechanisms
- Human Factors
- Materials

Overarching Systems Engineering guidelines and methodologies will also be addressed as a part of this assessment. Additional subsystems, or categories within subsystems, may be added during the assessment if merited based on the uniqueness of the domain area and the approach for reliable design.

4. **Description of the Work to be Performed:** The Contractor shall perform the following task requirements:

- 4.1 This task shall require elements of systems engineering work, development of specifications and statements of work, and evaluations of proposals and competitive announcements, as set forth in Clause H.11, Limitation of Future Contracting (NASA Clause 1852.209-71), contained in contract NNL05AA01B. As the resultant independent design for the CEV (including the Command Module, Service Module,

and the Launch Abort System) shall be used by the CEV Project and the CEV Source Selection team to assist in development of specifications and statements of work, and evaluations of proposals and competitive announcements, contractor personnel shall be required to certify both an Acknowledgement of Rules for Information Handling and Communication Control (for contractor employees supporting the CEV Smart Buyer Design Team) and a Disclosure of Disqualifying Conflicts of Interest.

4.2 CEV Smart Buyer Design Process Subteam Support

- 4.2.1 The contractor shall provide general expertise, consulting and product review through telecons, and occasional face-to-face meetings.
- 4.2.2 The contractor shall participate in the CEV Smart Buyer Design Process core team kickoff meeting.
- 4.2.3 The contractor shall participate in follow-on teleconferences and team meetings as requested.

4.3 NESC Support to CEV Activities

- 4.3.1 The contractor shall attend and participate in key program reviews such as Systems Requirements Reviews, Preliminary Design Reviews, or Critical Design Reviews, as required.
- 4.3.2 The contractor shall participate in telecons as required.
- 4.3.3 The contractor shall provide independent assessment of CEV approaches, plans and technical products.
- 4.3.4 The contractor shall provide recommendations for additional efforts where required.
- 4.3.5 The contractor, as required, shall work with independent NESC teams to conduct value added analysis and/or test as required to support and assess the CEV Project.
- 4.3.6 The contractor, as required, shall work with other senior-level engineering teams.
- 4.3.7 The contractor shall support meetings including the conduct of briefings, as required. Most product review activities will be conducted at the contractor's home site with occasional face-to-face meetings. Major reviews will be conducted at the Johnson Space Center. The contractor shall perform travel as required to support these meetings.

- 4.3.8 This support will require the ability to independently penetrate into program technical team activities, articulate deficiencies (in writing) and develop risk mitigation approaches.

4.4 Reliability of Critical Spacecraft Systems Assessment

- 4.4.1 Historical Systems Performance Review. The contractor shall support and conduct the research and assessment of historical NASA and other applicable systems.
- 4.4.2 Lessons-Learned. The contractor shall support the acquisition and review of lessons-learned from heritage NASA programs, review data from the Agency lessons-learned database, and solicit/review/analyze systems level lessons-learned.
- 4.4.3 External Benchmarking. The contractor shall support and conduct external benchmarking activities including the assessment of requirements generation and application, conduct of trade studies, design and test standards, performance history, and lessons learned.
- 4.4.4 Develop Requirements and Standards Reference. The contractor shall support the development of an initial Requirements and Standards Reference for NASA.
- 4.4.5 Synthesize and Document Findings. The contractor shall perform analysis and document results for incorporation into final project documentation. As required, the contractor shall develop briefings, graphics, and other documents as required.
- 4.4.6 Provide Subject Matter Experts. The contractor, as required, shall provide subject matter experts within 5 business days of the requirement. This includes all authorizations to travel and certifications for service including certification of no conflict of interest.
- 4.4.7 Meeting Support. The contractor shall support meetings including the conduct of briefings, as required. Meeting logistics support shall be provided as required.
- 4.4.8 Travel. The contractor shall perform travel as required to perform data acquisition, analysis, documentation, meeting and briefing support.

5. **Deliverables:**

5.1 CEV Smart Buyer Design Process

5.1.1 Monthly Reports: The contractor shall provide monthly reports summarizing all contracted activities, expenses to date, and funds remaining.

5.2 NESC Support to CEV Activities

5.2.1 Reports: The contractor shall provide written reports of findings and recommendations as required.

5.2.2 Final Report Inputs: The contractor shall provide all inputs to final reports and briefings as required to meet final out briefings to NASA stakeholders.

5.3 Reliability of Critical Spacecraft Systems Assessment

5.3.1 Monthly Reports: The contractor shall provide monthly reports summarizing all contracted activities, expenses to date, and funds remaining.

5.3.2 Final Report Inputs: The contractor shall provide all inputs to the final report and briefing as required to meet the final out briefing to NASA stakeholders.

5.3.3 Meeting Participation: The contractor shall participate in teleconferences and team meetings as requested. The contractor shall participate in weekly telecons and face-to-face meetings as scheduled in support of the Reliability of Critical Spacecraft Systems assessment team.

6. **Government Furnished Items:** None.

7. **Other Information Needed for Task Performance:** Data on the CEV Program.

8. **Period of Performance/Schedule:** The period of performance for this task order is January 21, 2006 through January 20, 2007. Milestones are outlined below:

| Milestone Number | SOW Paragraph | Milestones | Dates |
|------------------|---------------|--|------------|
| 1 | * | Task Order Start Date | [REDACTED] |
| | 5.1.1 | CEV Smart Buyer Design Process Core Team Kickoff Meeting | [REDACTED] |
| 2 | 5.3.1 | Monthly Technical Reports | [REDACTED] |
| 3 | 5.3.2 | Critical Spacecraft Systems Assessment - Final Report Delivery | [REDACTED] |
| 3 | 4.1 | Completion of Subtask for CEV Smart Buyer Design Process | [REDACTED] |
| 4 | * | Task Order Completion Date | [REDACTED] |

Changes to interim delivery dates shall be coordinated with and approved by the Task Monitor. Changes to the completion date must be approved by the Contracting Officer.

9. NASA Task Monitor

NASA TM: Kimberly A. Cannon
 Mail Stop (M/S): 105, Langley Research Center
 Phone Number: (757) 864-3814 / Fax Number: (757) 864-1388
 E-Mail Address: Kimberly.a.cannon@nasa.gov

ADDITIONAL CONTRACT CLAUSE

In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. NFS 1852.232-81 is incorporated as follows:

"CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for **NNL06AA77T** and covers the following estimated period of performance: **February 10, 2006.**

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)"

NOTE: Contract Summary attached.

CONTRACT SUMMARY

| TASK # | CONTRACT ACTION | AWARD DATE | TASK SUMMARY | | | FUNDING SUMMARY BY TASK OBL (+)/DEOB (-) | | | **TASK ORDER FUNDED THROUGH DATE | TASK ORDER PERFORMANCE PERIOD END DATE |
|--------|------------------------------------|------------|----------------|-----------|--------------|---|-----------|-------------|----------------------------------|--|
| | | | ESTIMATED COST | FIXED FEE | TOTAL CPFF | *ESTIMATED COST | FIXED FEE | TOTAL CPFF | | |
| | BASIC CONTRACT | 04/08/2005 | | | | | | | N/A | 04/07/2010 |
| | TASK ORDERS AND TASK MODIFICATIONS | | | | | | | | | |
| 1 | NNL05AB40T | 04/21/2005 | | \$ | \$292,148 | | | \$292,148 | 06/30/2006 | 06/30/2006 |
| 2 | NNL05AC14T | 06/02/2005 | | \$ | \$464,157 | | | \$191,638 | 08/05/2005 | 12/31/2006 |
| 3 | NNL05AC32T, Mod 5 | 06/27/2005 | | | \$281,156 | | | \$281,156 | 03/24/2006 | 03/24/2006 |
| 4 | NNL05AC33T, Mod 1 | 06/26/2005 | | | \$556,462 | | | \$75,000 | 12/31/2005 | 07/31/2006 |
| 5 | NNL05AC37T | 08/01/2005 | | | \$488,807 | | | \$100,000 | 11/05/2005 | 07/31/2006 |
| 6 | NNL05AC38T, Mod 1 | 08/01/2005 | | | \$926,929 | | | \$340,107 | 12/31/2005 | 11/02/2006 |
| 8 | NNL05AC64T, Mod 1 | 08/01/2005 | | | \$17,741 | | | \$17,741 | 10/31/2005 | 10/31/2005 |
| 9 | NNL05AC65T | 08/05/2005 | | | \$469,009 | | | \$300,000 | 04/30/2006 | 10/30/2006 |
| 10 | NNL05AB41T | 08/12/2005 | | | \$421,603 | | | \$200,000 | 02/28/2006 | 07/31/2006 |
| 11 | NNL05AB42T, Mod 1 | 08/25/2005 | | | \$1,318,359 | | | \$371,295 | 12/31/2005 | 04/30/2006 |
| 12 | NNL05AB43T, Mod 4 | 08/17/2005 | | | \$576,286 | | | \$307,671 | 01/27/2006 | 07/31/2006 |
| 13 | NNL05AD07T, Mod 1 | 09/01/2005 | | | \$124,330 | | | \$100,000 | 07/31/2006 | 09/30/2006 |
| 14 | NNL05AD08T | 09/01/2005 | | | \$607,162 | | | \$100,000 | 10/15/2005 | 08/31/2006 |
| 15 | NNL05AD33T | 09/28/2005 | | | \$116,487 | | | \$114,960 | 02/28/2006 | 03/31/2006 |
| 16 | NNL05AD32T | 09/15/2005 | | | \$286,737 | | | \$120,000 | 10/14/2005 | 09/29/2006 |
| 17 | NNL05AA06T | 11/22/2005 | | | \$298,920 | | | \$250,000 | 07/31/2006 | 10/31/2006 |
| 18 | NNL06AA39T | 12/02/2005 | | | \$273,834 | | | \$273,834 | 04/30/2006 | 04/30/2006 |
| 19 | NNL06AA40T | 12/07/2005 | | | \$845,437 | | | \$245,000 | 01/09/2006 | 05/30/2006 |
| 20 | NNL06AA41T | 12/06/2005 | | | \$698,128 | | | \$698,128 | 12/30/2006 | 12/30/2006 |
| 22 | NNL06AA43T | 01/13/2006 | | | \$237,738 | | | \$100,000 | 02/03/2006 | 08/31/2006 |
| 23 | NNL06AA77T | 01/21/2006 | | | \$727,164 | | | \$80,000 | 02/10/2006 | 01/20/2007 |
| | TOTAL | | | | \$10,009,604 | | | \$4,558,678 | | |

* Represents the estimated cost subject to FAR 52.232-22 entitled "Limitation of Funds" and NFS 1852.232-81 "Contract Funding"
 ** Represents the period of performance it is estimated the allotted funds will cover

**Rules of Engagement: Information Handling and Communication Control
During Preparation of the CEV "Call For Improvement"
and Administration of CEV Phase 1 Contracts**

Effective July 2005

Contracts for Crew Exploration Vehicle (CEV) Phase 1 design and development were awarded in June 2005 to Lockheed Martin and Northrop Grumman / Boeing. The two CEV Phase 1 contractors will perform under those CEV Phase 1 contracts until NASA down-selects to one CEV Phase 2 contractor, who will further develop and produce the CEV. The competitive down-selection is scheduled to culminate in a down-selection decision in March 2006.

During the period June 2005 through March 2006, NASA will be concurrently (a) administering the two CEV Phase 1 contracts awarded in June 2005 and (b) executing the steps required for making a competitive CEV Phase 2 down-selection decision. These concurrent undertakings must be conducted in a manner that safeguards the integrity of the down-selection competition as well as the integrity of the ongoing CEV project. Principal among the steps NASA must undertake in order to facilitate a competitive CEV Phase 2 down-selection while the CEV Phase 1 contractors perform under their existing CEV Phase 1 contracts are the preparation and issuance of a "Call for Improvement" (CFI). In response to NASA's CFI, the CEV Phase 1 contractors will submit competitive proposals to vie for down-selection to perform Phase 2 of the CEV project. Other activities NASA must accomplish in support of the CEV CFI process will include development of the Draft Systems Requirement Document, preparation of a CEV Phase 2 down-selection Source Selection Plan, constituting a Source Evaluation Board (SEB) to evaluate the contractors' responses to the CFI, and selection of one contractor to further develop and produce the CEV.

In order to ensure the mutual success of these concurrent activities, it is imperative that NASA and the two CEV Phase 1 contractors establish and maintain a disciplined approach for safeguarding the integrity of information flow as well as the integrity of the future competitive environment and consequent fairness to interested contractors. Accordingly, this document institutes a "Rules of Engagement" regime for information handling and communication control during preparation of the CEV CFI and administration of CEV Phase 1 contracts.

- A. The Rules of Engagement (ROE) establish a framework within which the following objectives can be met:
1. The integrity of the procurement process is protected.
 2. The two CEV Phase 1 contracts are administered equitably, in accordance with the contracts' terms and conditions, and to the optimum mutual benefit of NASA and the respective contractors.

3. The two CEV Phase 1 contractors have the opportunity to compete fairly for down-selection.
 4. The CFI yields a Phase 2 competition which optimizes fairness to the competitors and which optimizes the quality of the outcome for NASA.
 5. The CEV "Call For Improvement" (CFI) solicitation document and process is not tainted, compromised, or otherwise influenced by the concurrent Phase 1 activities.
 6. Formulation of the CFI is independent of the Phase 1 proposals and Phase 1 SEB findings. The CFI is not tailored to fit or favor one competitor's approach or solution over the approach or solution of the other competitor. Instead, the CFI represents the independent and impartial statement of NASA's requirements.
 7. NASA benefits from an optimum down-selection competition between contractors who thoroughly understand NASA's requirements.
 8. The two CEV Phase 1 contractors have the opportunity to share their work with NASA in a collaborative environment.
 9. The two CEV Phase 1 contractors' proprietary and confidential business information is safeguarded from disclosure to each other or to anyone else who is not authorized to have access to such information, including certain NASA personnel.
 10. NASA personnel are able to gain insight into the CEV Phase 1 contractors' designs, analyses, processes, decisions, etc., in order to assess contractor plans, performance, and risks, and to make recommendations regarding contractor activities.
- B. In order to protect the procurement process while at the same time providing adequate design insight and participation by NASA personnel, the following Rules of Engagements will be observed:
1. In accordance with the CEV acquisition plan, as they are performing under their Phase 1 contracts, the Phase 1 contractors also are competing for the Phase 2 down-selection. As such, information handled by NASA personnel in the course of managing the Phase 1 contracts is sensitive as information that potentially is not only proprietary, confidential, and/or trade secret, but also as information that is competition sensitive and/or source selection information. In accordance with law and regulation (i.e., Trade Secrets Act, Procurement Integrity Act, Federal Acquisition Regulation (FAR), and NASA FAR Supplement), NASA must exercise due diligence in protecting all such information.
 2. The "black-out" period prescribed by the NASA FAR Supplement, during which time communications will be strictly limited, will not commence until the CFI is released. During the "black-out" period, communication between NASA and the Phase 1

contractors and subcontractors about the CFI will be prohibited except to the extent that such communication is necessary for the contractors' Phase 1 contract performance. Although the "black-out" period is not yet in effect during the current CFI development phase, communication and interactions will be controlled in accordance with the ground-rules set forth herein.

3. Both before and after the formal black-out period commences, NASA's CEV CFI team is restricted from interacting directly with the CEV Phase 1 contractors and subcontractors. In accordance with law and regulation (i.e., Procurement Integrity Act, Federal Acquisition Regulation (FAR), and NASA FAR Supplement), NASA must exercise due diligence in ensuring a fair competitive environment and to protect sensitive acquisition planning information. Consequently, to the extent that communication between the CEV Phase 1 contractors/subcontractors and CFI personnel is required, there will be a formal "controlled interface" such that communication must be channeled through specifically designated points of contact (namely, Contracting Officer Katherine Autry, Contracting Officer's Technical Representative Fred Ouellette, and Phase 1 Lead Charles Dingell on behalf of the Phase 1 contract management team and Contracting Officer Lee Pagel and CFI Lead Robert Floyd on behalf of the CFI team). In fact, the contractors and subcontractors have been instructed that their communication with NASA concerning CEV must be only via Contracting Officer Katherine Autry, Contracting Officer's Technical Representative Fred Ouellette, Phase 1 Lead Charles Dingell, and specifically designated technical points of contact.
4. There is no restriction on communication between NASA personnel working on CFI activities and NASA personnel working on Phase 1 contract management activities. Nonetheless, such interaction should be minimized and prudently confined to necessary subject matter. Such permissible subject matter reasonably might include CFI requirements to be passed to the Phase 1 personnel for the purposes of contractor input or analysis. In such cross-team circumstances, all NASA personnel shall adhere to these ROE and shall abide by any applicable restrictions concerning data that is proprietary, confidential, trade secret, competition sensitive, and/or source selection information.
5. NASA personnel assigned to work on Phase 1 activities may penetrate, probe, and investigate the contractors' plans, processes, designs, analyses, etc., to the depth necessary to understand their approaches. If NASA personnel do not understand the approach, they should give the contractors the opportunity to explain their approaches by asking questions regarding their assumptions, data sources, models, etc.
6. The focus of NASA personnel assigned to work on Phase 1 activities must be on a requirements-based strategy. That is, the contractors should be asked to explain how their approaches satisfy the requirements. The contractors' need to explore alternatives during the requirements development process. However, NASA personnel must avoid participating in design decisions at a level below that for which the requirements have been base-lined.

7. NASA personnel assigned to work on Phase 1 activities may probe relevant areas by asking the contractors to explain what they have done in those areas. However, NASA personnel must avoid directing new or accelerated work or asking for data that is not required to fulfill Phase 1 contract requirements or would require new or accelerated work on the contractors' part.
8. It is the contractors' responsibility to make the decisions necessary to develop their approaches, designs, etc. NASA personnel must avoid directing the contractors or voting in their decision-making processes.
9. NASA personnel assigned to work on Phase 1 activities cannot offer design solutions but may offer relevant, non-proprietary experience that supports the contractors' decision-making process. If issues concerning a contractor's approach are observed, NASA personnel may explain why in terms of non-compliance with approved requirements, technical issues, invalid assumptions, etc.
10. In offering feedback to the contractors, NASA personnel should refer to reports, requirements, documentation, etc., that substantiate their position.
11. NASA POCs, leads, etc., have been identified for all subsystems, technical disciplines, etc. NASA personnel assigned to work on Phase 1 activities should reference these personnel in their interactions with the contractors and offer to identify or engage the appropriate subject matter expert.
12. NASA personnel assigned to work on Phase 1 activities must ensure consistency when responding to the contractors. The same data should be provided to both in response to the same question or request for information. In cases where NASA identifies information that is useful to the contractors, that information will be provided to both contractors. However, a question asked by only one contractor that is specific to that contractor's technical approach or design solution (or that might reveal that contractor's technical approach or design solution) may not be shared with the other contractor.
13. In order to safeguard contractor data, NASA personnel must not reveal the plans, concepts, or products created by one contractor with the other contractor. NASA personnel must be vigilant and disciplined about differentiating between the two competing contractors' approaches and solutions. In no circumstance are NASA personnel permitted to transfuse approaches or solutions from one contractor to the other. Nor can NASA personnel let one contractor's approach and solutions influence his/her input when interacting with the other contractor. NASA personnel must compartmentalize all such information about the respective contractors so that interaction with and comments to each contractor is independent of and not influenced by knowledge, understanding, and/or opinion of the competitor's approach and solutions.

14. Specific mechanisms and protocols to safeguard such proprietary and/or competition sensitive information of the respective contractors will be explained in greater detail in a separate document to be furnished to the contractors. These measures will be developed and implemented in cooperation with both contractors.
 15. If, at any time, NASA personnel believe that a contractor's approach, plans, decisions, designs, assumptions, etc., are inappropriate and he/she has been unable to influence the contractor within these ROE, then he/she should raise that as an issue to NASA management. In such circumstances, NASA personnel should query the contractor to understand the contractor's approach, design, rationale, etc., then prepare for management review a discussion on what's wrong with that approach and what corrective action is required.
- C. In recognition of these considerations, the following specific instructions for communication and document handling shall be observed, effective immediately and effective until one contractor has been selected to develop the CEV:
1. Identify all personnel supporting current CFI development activities and all personnel involved with the administration of the CEV Phase 1 contracts. All such personnel are expected to read, understand, and abide by this guidance and the restrictions set forth herein. Moreover, all such personnel should receive the procurement integrity and ethics training required by their respective centers. It is incumbent upon all personnel affected by this guidance to handle and distribute all information related to the CEV on a "need-to-know" basis and in accordance with this guidance.
 2. Certain information and documentation generated and circulated will be "Source Selection Information" and must be marked and handled accordingly. In accordance with the Procurement Integrity Act, FAR, and NASA FAR Supplement, the following must be protected as "Source Selection Information" during CFI formulation stage of the procurement:
 - Source selection plan
 - Technical evaluation plan
 - Anything that would jeopardize the integrity of the procurement if disclosed
 3. Although the CEV Phase 1 Source Evaluation Board (SEB) has completed its task and the consequent award decision has been rendered and announced, much of the information associated with the SEB (i.e., offerors' proposals, SEB's findings and other SEB products) remains sensitive. It is sensitive for a variety of reasons. For instance, most of the information submitted by the offerors is proprietary, trade secret, confidential business information, and/or otherwise sensitive or restricted. Moreover, due to the CEV's competitive down-selection, the information remains competition sensitive.

4. Personnel who participated in any fashion (i.e., as a Board member, evaluator, or advisor) in the CEV Phase 1 SEB are under the continuing obligation to protect any and all information to which they had access while participating in the SEB. As such, each individual who participated in the CEV SEB must continue to abide by the commitment to SEB confidentiality by not disclosing proposal information or SEB findings about the proposals. He/she must safeguard and compartmentalize what he/she knows about the proposals and SEB findings when working on other matters, including preparation of the CFI.
5. Ultimately, the integrity of both activities will be heavily reliant on the individual personal responsibility of NASA personnel. They are responsible for policing their own interactions. NASA personnel working on CEV matters are bound by obligations dictated by competition sensitivity and obligations associated with handling confidential business information, proprietary information, trade secrets, and other kinds of sensitive information. It is an individual responsibility but the implications of not fulfilling such responsibilities have implications on both the individual and NASA. Individually, personnel whose conduct or communication is inconsistent with their obligations to protect sensitive information may be subject to administrative and even criminal penalties under law and regulation. Moreover, such violations could impact NASA if the integrity of the CFI and/or the result of the CEV down-selection are challenged based on inappropriate sharing of embargoed sensitive information.
6. All other documentation and products related to the CFI but deemed not to be "Source Selection Information" as defined in paragraph 2 above must be marked and disseminated as "Administratively Controlled Information (ACI) / For Government Use Only." Administratively Controlled Information is information the unauthorized disclosure of which could result in loss of business for our partner and customers, damage to our employees, official relationships and embarrassment to NASA. This criterion must be considered for marking any legal, business, personnel, and pre-decisional information. Handling instructions for "Administratively Controlled Information (ACI) / For Government Use Only" data:
 - Data Marking: The information owner/generator is responsible for marking documents on the cover page according to the above categories. Absent a marking indicating "Source Selection Information" or "Administratively Controlled Information (ACI) / For Government Use Only," information will be assumed to be public or otherwise non-controlled information.
 - Distribution: Limited to people who have a need of the information in connection with official duties.
 - Hard copies: In preparation of documents, the number of copies shall be kept to a minimum.
 - Physical storage: Store sensitive data in locked cabinets, desks, other containers, or within a restricted or nonpublic area when not in use.

- Fax: Sensitive information is allowed as long as the receiver stands by the Fax machine to retrieve information. It is recommended for the sender keep the transaction record.
- Electronic copies: Sensitive data can be stored in CD (or any diskette) with proper marking (including file names indicating it's ACI status) and mailed out to specific people. Use certified mail to ensure the receiver acknowledgement.
- Electronic posting to servers: Ensure that unencrypted sensitive data is only posted on the NASA authorized secure network. However, Entrust PKI encryption is approved by NASA for the exchange of sensitive data.
- Teleconference: If telecon is required for discussing sensitive data, it is recommended that Operator call the participants instead of setting up Meet-Me-Numbers. In case of Meet-Me-Numbers telecon, use two separate e-mails to distribute the telephone number and password if they are not encrypted.

FOR MORE INFORMATION

If you have questions about the information set forth herein as it pertains to:

- (a) the CEV Call For Improvement, please call Contracting Officer Lee Pagel or CFI Lead Robert Floyd; or
- (b) the management of the CEV Phase 1 contracts, please call Contracting Officer Katherine Autry, Contracting Officer's Technical Representative Fred Ouellette, or Phase 1 Lead Charles Dingell.

**ACKNOWLEDGEMENT OF RULES FOR INFORMATION
HANDLING AND COMMUNICATION CONTROL
(For Contractor Employees Supporting CEV Smart Buyer Design Team)**

As part of my participation in Delivery Order NNL06AA77T under Contract number NNL05AA01B, I have been requested to participate in the Crew Exploration Vehicle (CEV) "Smart Buyer" Design Team. I understand that my duties will require me to perform studies and analyses which involve elements of systems engineering, and that will be used to develop specifications and statements of work, and evaluate proposals. Accordingly, there exists the potential for a conflict of interest between my duties on the CEV Smart Buyer Design Team, and my personal financial interests.

I acknowledge that my duties and contractual responsibilities cause me to have access to source selection, proprietary, or proposal information in conjunction with the Design Team. I am aware that unauthorized disclosure of this information could damage the integrity of this team and any related procurement, and that the transmission or revelation of such information to unauthorized persons could subject me or my organization to contractual remedies or prosecution under applicable laws.

I hereby acknowledge that I read and understand the document entitled Rules of Engagement: Information Handling and Communication Control During Preparation of the CEV "Call For Improvement" and Administration of CEV Phase 1 Contracts dated July 2005 and affirmatively agree to comply with the guidelines and restrictions set forth therein.

NONDISCLOSURE DUTIES AND RESPONSIBILITIES

As a recipient of sensitive Government and/or contractor information concerning NASA's Crew Exploration Vehicle (CEV) project and as a participant in activities associated with the administration of the CEV Phase 1 contracts, formulation and future competition of the CEV Phase 2 contract, and/or the prospective CEV Call For Improvement (CFI) that will facilitate the competitive down-selection for CEV Phase 2, I represent, acknowledge, certify, and agree to the following:

- I will not discuss or reveal any contractor-furnished information, source selection information, or sensitive Government acquisition planning information concerning these activities and proceedings to anyone who is not similarly authorized to receive the same information, and then only to the extent that such information is required in connection with such proceedings on a "need-to-know" basis and subject to the knowledge and consent of the CEV Smart Buyer Design Team Lead (The NESC Director) or his/her duly authorized designee.
- I may be furnished or have access to technical, business, and other information which may be confidential, administratively controlled, trade secret, "For Official Use Only," procurement sensitive, source selection sensitive, competition sensitive, proprietary, trade secret, and/or otherwise sensitive or restricted. Regardless of how such information and data is or is not marked or labeled, I agree and acknowledge that I will not knowingly disclose, divulge, release or disseminate any such information to anyone except persons approved by NASA as authorized recipients who have a "need-to-know." I agree to protect this information from unauthorized use or disclosure and to refrain from using the information for any purpose other than that for which it was furnished.
- Breach of my obligations to safeguard and to not disclose to unauthorized persons any Government or contractor information made available to me concerning the CEV project may result in criminal, administrative, and/or disciplinary action.

DISCLOSURE OF DISQUALIFYING CONFLICTS OF INTEREST

I represent that I have no past, present, or planned interest or relationship that would interfere with my ability to render impartial, unimpaired, technically sound, and objective assistance.

I represent that I have no financial interest or relationship that would represent an actual conflict of interest or that would create an appearance of a conflict of interest. Specifically, I represent that I do not have a financial interest (including any financial interest of my spouse, minor child, or general partner) in any of the CEV prime contractors or subcontractors. Mutual funds (other than sector funds concentrated in the defense or aerospace industries), diversified investments, or blind trusts are not considered financial interests for the purposes of this acknowledgement.

I acknowledge that I have a continuing obligation to identify and disclose actual or potential conflicting interests and an obligation to recuse myself from CEV activities in the event of such a conflict. Consequently, I agree that, if at any time during the course of these CEV activities I discover that I have an interest in, or connection with, a CEV contractor or subcontractor, I shall promptly the facts and circumstances of such interest or connection to the SAIC Contracts Representative responsible for the contract, and not participate further until the potential conflict has been resolved by the CEV Smart Buyer Design Team Lead (The NESC Director) or his/her duly authorized designee. I recognize that a reportable interest or connection includes the following:

- a. An ownership interest in or employment by myself, my spouse, minor child or general partner in any of the CEV contractors or subcontractors.
- b. Any other interest in or connection with any of the CEV contractors or subcontractors which might tend to subject my organization or the U.S. government to criticism on the basis that such interest or connection would impair my objectivity in performing work related to CEV activities.

ACKNOWLEDGEMENT OF CONTRACTUAL RESPONSIBILITIES

I further understand that as an employee of a NASA contractor or subcontractor, I may be subject to additional requirements, imposed by my employer or the NASA contract, concerning the handling of data. I understand and agree to comply with those provisions.

TIME LIMITATIONS

I acknowledge that the duty not to knowingly disclose non-public information (confidential, administratively controlled, trade secret, "For Official Use Only," procurement sensitive, source selection sensitive, competition sensitive, proprietary, trade secret, and/or otherwise sensitive or restricted) is a continuing obligation, which will apply until the information is no longer subject to restrictions on further release. Unless otherwise extended or modified by my future participation in work under NASA contract, my duty to disclose actual or potential conflicts of interest and take corrective action will end upon the completion of my participation in Delivery Order NNL06AA77T under Contract number NNL05AA01B.

NAME (PRINT): _____

EMPLOYED BY: _____

SIGNATURE: _____ DATE: _____

| | | | | |
|---|---|---|-------------------------------|---|
| AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT | | | 1. CONTRACT ID CODE | PAGE 1 OF 2 PAGE(S) |
| 2. AMENDMENT/MODIFICATION NO. 1 | 3. EFFECTIVE DATE See Block 16c below. | 4. REQUISITION/PURCHASE REQ. NO. See Block 12 below. | 5. PROJECT NO (if applicable) | |
| 6. ISSUED BY National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681-2199 | | 7. ADMINISTERED BY (if other than item 6) | | |
| 6. NAME AND ADDRESS OF CONTRACTOR (No, Street, county, State and ZIP Code) SCIENCE APPLICATIONS INTERNATIONAL CORPORATION 10260 CAMPUS POINT DRIVE SAN DIEGO, CA 92121 ATTN: [REDACTED] | | | (A) | 9A. AMENDMENT OF SOLICITATION NO. |
| CODDE 0T5L1 FACILITY CODE | | | X | 9B. DATED (SEE ITEM 11) 10A. MODIFICATION OF CONTRACT/ORDER NO. NNL05AA01B / NNL06AA77T 10B. DATED (SEE ITEM 13) January 21, 2006 |

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of offers is extended, is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:
 (a) By completing items 8 and 15, and returning one (1) copy of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required)
PR: 4200143774 \$33,325 (COMPLETE)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

| | |
|-----|---|
| (A) | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. |
| | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.102(b). |
| | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: |
| | D. OTHER Specify type of modification and authority: |
| X | FAR 52.243-2, CHANGES - COST-REIMBURSEMENT (ALTERNATE V) (APR 1984) |

E. IMPORTANT: Contractor is not, is required to sign this document and return 1 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to revise the Statement of Work (SOW), order value (Block 17 of the OF347), and the estimated funded through date. Accordingly, the task order terms and conditions are revised as follows:

(CONTINUED)

Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remain unchanged and in full force and effect.

| | | | |
|--|-------------------------------|--|-------------------------------|
| 15A. NAME AND TITLE OF SIGNER (Type or print) SARAH CAMPBELL SENIOR CONTRACTS MANAGER | | 15B. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) DARLA J. CLIFTON | |
| 15C. CONTRACTOR/OFFEROR <i>Sarah Campbell</i> (Signature of person authorized to sign) | 15D. DATE SIGNED 27 Jan 06 | 15E. UNITED STATES OF AMERICA BY <i>Darla Clifton</i> (Signature of Contracting Officer) | 15F. DATE SIGNED 27 Jan 06 |
| NSN 7540-01-152-8070 PREVIOUS EDITION UNUSABLE | | 30-105 Computer Generated | |
| STANDARD FORM 30 (REV. 10-83) Prescribed by GSA FAR (48 CFR) 53.243 | | | |

1. The SOW provided in the original task order award is replaced with the version attached (Attachment 1).
2. As a result of the revisions to the SOW, the order value amounts listed in Paragraph 17 of the OF347 are revised as follows:

17f: Estimated Cost: [REDACTED]
Fixed Fee: [REDACTED]
Total Cost Plus Fixed Fee: \$760,884

17i: Grand Total: \$760,884

3. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

“CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for NNL06AA77T and covers the following estimated period of performance: February 17, 2006.

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)”

4. All other terms and conditions remain unchanged.

**Science Applications International Corporation (SAIC)
Contract NNL05AA01B
Task Order Statement of Work**

1. **Task Order Title:** NESC Support to Crew Exploration Vehicle (CEV) and Crew Launch Vehicle (CLV) Projects
2. **Reference:** This requirement is pursuant to contract NNL05AA01B, between NASA Langley Research Center and Science Applications International Corporation. Refer to Paragraph 3.0, Proposal and Mission Concept Evaluations; and Paragraph 5.0, Studies of the basic contract Statement of Work.
3. **Purpose, Objective, and Background of Work to be Performed:** NASA is currently undergoing a transformation to manage the work ahead in pursuit of the President's Vision for Space Exploration. The Administrator desires to rekindle the Agency's capacity to be "good stewards" of the design, development, test, and evaluation process in support of future flight systems. To that end, the Agency must develop the "self-knowledge" of our strengths and weaknesses within NASA. The NESC is currently supporting this effort through the following activities and has identified requirements for subject matter experts in support of these activities.
 - 3.1 At the request of the Administrator, the NESC has initiated an intra-agency team to develop an independent design for the CEV including the Command Module, Service Module, and the Launch Abort System. This independent design will be used by the CEV Project and the CEV Source Selection team to assist in the evaluation of contractor proposals. This will allow substantial agency-wide penetration into the design challenges faced with the CEV procurement providing opportunities for our Agency team to better assess competing bids from our commercial responders. The team will brainstorm, prioritize and complete the trade studies, design improvements and additional design details needed to ensure the final product is an innovative approach for a CEV design. In support of this task, a number of Subsystem Design Teams will be formed.

The contractor shall participate as a member of the CEV Smart Buyer Design Process Subteam by providing expert consultations and lessons learned based on their experiences from Apollo era programs. The contractor will participate in the brainstorming sessions to identify possible design improvements, necessary trade studies, and critical subsystems that warrant additional design detail. The contractor will participate in the evaluation and prioritization of design work. Once the prioritized list of design improvements and trade studies has been determined, the corresponding Subsystem Design Teams will be established to complete the necessary design work.
 - 3.2 The NESC will also be providing support to ongoing CEV activities at the request of the Exploration Sciences Mission Directorate and will require senior-level consulting in support of these activities which are yet to be determined.
 - 3.3 Recent activities, particularly exploration initiatives, within the agency have renewed interest in "best practices" for designing reliable spacecraft systems. The NESC has been requested to study and report out on design and verification methodologies for maximizing and assessing critical spacecraft system reliability. The objective of this Reliability of Critical

Spacecraft Systems assessment is to bring reliability subject matter experts, subsystem/discipline/domain experts and systems engineering experts together to synthesize the current "best practices" in critical spacecraft system reliability. The activity will not only address the design element of reliability, but will also investigate other key facets integral to system reliability, such as, test and verification methodologies for demonstration of reliability and appropriate tools for the assessment and quantification of system reliability.

The Contractor shall support efforts to integrate and document "Best Practice" aspects of designing, verifying and quantifying the reliability of spacecraft systems. The scope will require data on historical system performance, lessons learned from previous efforts and benchmarking outside the agency on organizations and programs with responsibilities for safety of comparable or greater magnitude. Historical systems will include both heritage NASA systems and other critical systems as applicable (e.g., military, commercial aerospace, etc.). Lessons learned will span formal agency lessons learned databases, as well as corporate knowledge from agency experts. Other high reliability organizations outside of NASA will be benchmarked to measure and challenge our design, test and assessment methodologies. The scope will encompass several critical subsystems and disciplines including:

- Structures
- Avionics
- Software
- Guidance, Navigation and Control
- Propulsion
- Life Support and Active Thermal Control
- Mechanisms
- Human Factors
- Materials

Overarching Systems Engineering guidelines and methodologies will also be addressed as a part of this assessment. Additional subsystems, or categories within subsystems, may be added during the assessment if merited based on the uniqueness of the domain area and the approach for reliable design.

- 3.4 The baseline CLV vehicle configuration identified in the Exploration Systems Architecture Study (ESAS) requires an update to meet project system requirements. An interim concept extends the upper stage by approximately 22.5 feet through a combination of increases in the oxidizer and fuel tank length and the insertion of a forward skirt to the first stage. The CLV Project Office has requested NESC support in determining if the proposed length increase has any known first order design barriers or limits that require resolution prior to the investment of considerable analysis refinement. The NESC has assembled an independent team of structures and guidance, navigation and control experts to identify any known issues that would preclude the continuance of the analysis phase. This information is needed as a precursor for a commitment to detailed design and to influence the simulated upper stage design of the CLV Development Test Flight (DTF)-1.
- 3.5 The contractor shall participate as a member of the NESC CLV Insight Team to provide technical area expert review of the preliminary design for the CLV in the areas of vehicle layout and design, structures, structural dynamics and loads, ascent flight dynamics and design, and interaction with vehicle flight control system. The contractor shall consider all

flight phases such as ground handling and pre-launch, liftoff, ascent, engine cutoff, staging, and recovery of any reusable elements.

4. **Description of the Work to be Performed:** The Contractor shall perform the following task requirements:
- 4.1 This task shall require elements of systems engineering work, development of specifications and statements of work, and evaluations of proposals and competitive announcements, as set forth in Clause H.11, Limitation of Future Contracting (NASA Clause 1852.209-71), contained in contract NNL05AA01B. As the resultant independent design for the CEV (including the Command Module, Service Module, and the Launch Abort System) shall be used by the CEV Project and the CEV Source Selection team to assist in development of specifications and statements of work, and evaluations of proposals and competitive announcements, contractor personnel shall be required to certify both an Acknowledgement of Rules for Information Handling and Communication Control (for contractor employees supporting the CEV Smart Buyer Design Team) and a Disclosure of Disqualifying Conflicts of Interest.
- 4.2 **CEV Smart Buyer Design Process Subteam Support**
- 4.2.1 The contractor shall provide general expertise, consulting and product review through telecons, and occasional face-to-face meetings.
- 4.2.2 The contractor shall participate in the CEV Smart Buyer Design Process core team kickoff meeting.
- 4.2.3 The contractor shall participate in follow-on teleconferences and team meetings as requested.
- 4.3 **NESC Support to CEV Activities**
- 4.3.1 The contractor shall attend and participate in key program reviews such as Systems Requirements Reviews, Preliminary Design Reviews, or Critical Design Reviews, as required.
- 4.3.2 The contractor shall participate in telecons as required.
- 4.3.3 The contractor shall provide independent assessment of CEV approaches, plans and technical products.
- 4.3.4 The contractor shall provide recommendations for additional efforts where required.
- 4.3.5 The contractor, as required, shall work with independent NESC teams to conduct value added analysis and/or test as required to support and assess the CEV Project.
- ~~4.3.6 The contractor, as required, shall work with other senior-level engineering teams.~~

- 4.3.7 The contractor shall support meetings including the conduct of briefings, as required. Most product review activities will be conducted at the contractor's home site with occasional face-to-face meetings. Major reviews will be conducted at the Johnson Space Center. The contractor shall perform travel as required to support these meetings.
- 4.3.8 This support will require the ability to independently penetrate into program technical team activities, articulate deficiencies (in writing) and develop risk mitigation approaches.

4.4 Reliability of Critical Spacecraft Systems Assessment

- 4.4.1 Historical Systems Performance Review. The contractor shall support and conduct the research and assessment of historical NASA and other applicable systems.
- 4.4.2 Lessons-Learned. The contractor shall support the acquisition and review of lessons-learned from heritage NASA programs, review data from the Agency lessons-learned database, and solicit/review/analyze systems level lessons-learned.
- 4.4.3 External Benchmarking. The contractor shall support and conduct external benchmarking activities including the assessment of requirements generation and application, conduct of trade studies, design and test standards, performance history, and lessons learned.
- 4.4.4 Develop Requirements and Standards Reference. The contractor shall support the development of an initial Requirements and Standards Reference for NASA.
- 4.4.5 Synthesize and Document Findings. The contractor shall perform analysis and document results for incorporation into final project documentation. As required, the contractor shall develop briefings, graphics, and other documents as required.
- 4.4.6 Provide Subject Matter Experts. The contractor, as required, shall provide subject matter experts within 5 business days of the requirement. This includes all authorizations to travel and certifications for service including certification of no conflict of interest.
- 4.4.7 Meeting Support. The contractor shall support meetings including the conduct of briefings, as required. Meeting logistics support shall be provided as required.
- 4.4.8 Travel. The contractor shall perform travel as required to perform data acquisition, analysis, documentation, meeting and briefing support.

4.5 NESC Support to CLV Activities

- 4.5.1 The contractor shall perform a critical review of the CLV preliminary design for acceptability to proceed to a detailed design cycle and identify areas of concern that may require modification, redesign, special analysis, additional data, or return to preliminary design for resolution.

- 4.5.2 The contractor shall participate in required team telecons and face to face meetings and contribute to preparation of final team report and briefing charts.
- 4.5.3 The contractor shall perform travel as required to perform data acquisition, analysis, documentation, meeting and briefing support.

5. **Deliverables:**

5.1 **CEV Smart Buyer Design Process**

- 5.1.1 **Monthly Reports:** The contractor shall provide monthly reports summarizing all contracted activities, expenses to date, and funds remaining.

5.2 **NESC Support to CEV Activities**

- 5.2.1 **Reports:** The contractor shall provide written reports of findings and recommendations as required.
- 5.2.2 **Final Report Inputs:** The contractor shall provide all inputs to final reports and briefings as required to meet final out briefings to NASA stakeholders.

5.3 **Reliability of Critical Spacecraft Systems Assessment**

- 5.3.1 **Monthly Reports:** The contractor shall provide monthly reports summarizing all contracted activities, expenses to date, and funds remaining.
- 5.3.2 **Final Report Inputs:** The contractor shall provide all inputs to the final report and briefing as required to meet the final out briefing to NASA stakeholders.
- 5.3.3 **Meeting Participation:** The contractor shall participate in teleconferences and team meetings as requested. The contractor shall participate in weekly telecons and face-to-face meetings as scheduled in support of the Reliability of Critical Spacecraft Systems assessment team.

5.4 **NESC Support to CLV Activities**

- 5.4.1 The contractor shall provide all inputs to the final report and briefing as required to meet the final out briefing to NASA stakeholders.

6. **Government Furnished Items:** None.

7. **Other Information Needed for Task Performance:** Data on the CEV and CLV Programs.

8. **Period of Performance/Schedule:** The period of performance for this task order is January 20, 2006 through January 19, 2007. Milestones are outlined below:

| Milestone Number | SOW Paragraph | Milestones | Dates |
|------------------|---------------|--|------------|
| 1 | * | Task Order Start Date | [REDACTED] |
| 2 | 5.1.1 | CEV Smart Buyer Design Process Core Team Kickoff Meeting | [REDACTED] |
| 3 | 4.5.2 | CLV Technical Interchange Meeting | [REDACTED] |
| 4 | 4.5.2 & 5.4.1 | Input Required for Final Report and Briefing Charts | [REDACTED] |
| 5 | 5.3.1 | Monthly Technical Reports | [REDACTED] |
| 6 | 5.3.2 | Critical Spacecraft Systems Assessment - Final Report Delivery | [REDACTED] |
| 7 | 4.1 | Completion of Subtask for CEV Smart Buyer Design Process | [REDACTED] |
| 8 | * | Task Order Completion Date | [REDACTED] |

Changes to interim delivery dates shall be coordinated with and approved by the Task Monitor. Changes to the completion date must be approved by the Contracting Officer.

9. **NASA Task Monitor**

PRIMARY NASA TM: Kimberly A. Cannon
 Mail Stop (M/S): 105, Langley Research Center
 Phone Number: (757) 864-3814 / Fax Number: (757) 864-1388
 E-Mail Address: Kimberly.a.cannon@nasa.gov

ALTERNATE NASA TM: Cynthia L. Bruno
 Mail Stop (M/S): 105, Langley Research Center
 Phone Number: (757) 864-6065 / Fax Number: (757) 864-1388
 E-Mail Address: Cynthia.L.Bruno@nasa.gov

CONTRACT SUMMARY

| TASK # | CONTRACT ACTION | AWARD DATE | TASK SUMMARY | | | FUNDING SUMMARY BY TASK | | | **TASK ORDER FUNDED THROUGH DATE | TASK ORDER PERFORMANCE PERIOD END DATE |
|---|-------------------|------------|----------------|-----------|---------------------|-------------------------|----------------------------|--------------------|----------------------------------|--|
| | | | ESTIMATED COST | FIXED FEE | TOTAL CPFF | *ESTIMATED COST | OBL (+)/DEOB (-) FIXED FEE | TOTAL CPFF | | |
| | BASIC CONTRACT | 04/08/2005 | | | | | | | N/A | 04/07/2010 |
| TASK ORDERS AND TASK MODIFICATIONS | | | | | | | | | | |
| 1 | NNL05AB40T | 04/21/2005 | | \$ | \$292,148 | | | \$292,148 | 06/30/2006 | 06/30/2006 |
| 2 | NNL05AC14T | 06/02/2005 | | \$ | \$464,157 | | | \$191,638 | 08/05/2005 | 12/31/2006 |
| 3 | NNL05AC32T, Mod 5 | 06/27/2005 | | \$ | \$281,156 | | | \$281,156 | 03/24/2006 | 03/24/2006 |
| 4 | NNL05AC33T, Mod 1 | 06/28/2005 | | \$ | \$556,462 | | | \$75,000 | 12/31/2005 | 07/31/2006 |
| 5 | NNL05AC37T | 08/01/2005 | | \$ | \$488,807 | | | \$100,000 | 11/05/2005 | 07/31/2006 |
| 6 | NNL05AC38T, Mod 1 | 08/01/2005 | | \$ | \$926,929 | | | \$340,107 | 12/31/2005 | 11/02/2006 |
| 8 | NNL05AC64T, Mod 1 | 08/01/2005 | | \$ | \$17,741 | | | \$17,741 | 10/31/2005 | 10/31/2005 |
| 9 | NNL05AC65T | 08/05/2005 | | \$ | \$469,009 | | | \$300,000 | 04/30/2006 | 10/30/2006 |
| 10 | NNL05AB41T | 08/12/2005 | | \$ | \$421,603 | | | \$200,000 | 02/28/2006 | 07/31/2006 |
| 11 | NNL05AB42T, Mod 1 | 08/25/2005 | | \$ | \$1,318,359 | | | \$371,295 | 12/31/2005 | 04/30/2006 |
| 12 | NNL05AB43T, Mod 5 | 08/17/2005 | | \$ | \$590,925 | | | \$366,542 | 03/14/2006 | 07/31/2006 |
| 13 | NNL05AD07T, Mod 1 | 09/01/2005 | | \$ | \$124,330 | | | \$100,000 | 07/31/2006 | 09/30/2006 |
| 14 | NNL05AD08T, Mod 1 | 09/01/2005 | | \$ | \$607,162 | | | \$185,000 | 02/28/2006 | 08/31/2006 |
| 15 | NNL05AD33T | 09/28/2005 | | \$ | \$116,487 | | | \$114,960 | 02/28/2006 | 03/31/2006 |
| 16 | NNL05AD32T | 09/15/2005 | | \$ | \$266,737 | | | \$120,000 | 10/14/2005 | 09/29/2006 |
| 17 | NNL06AA06T | 11/22/2005 | | \$ | \$299,920 | | | \$250,000 | 07/31/2006 | 10/31/2006 |
| 18 | NNL06AA39T | 12/02/2005 | | \$ | \$273,834 | | | \$273,834 | 04/30/2006 | 04/30/2006 |
| 19 | NNL06AA40T | 12/07/2005 | | \$ | \$845,437 | | | \$245,000 | 01/09/2006 | 05/30/2006 |
| 20 | NNL06AA41T | 12/05/2005 | | \$ | \$698,128 | | | \$698,128 | 12/30/2006 | 12/30/2006 |
| 21 | NNL06AA42T | 01/27/2006 | | \$ | \$931,031 | | | \$250,000 | 06/30/2006 | 12/31/2006 |
| 22 | NNL06AA43T | 01/13/2006 | | \$ | \$237,738 | | | \$100,000 | 02/03/2006 | 08/31/2006 |
| 23 | NNL05AA77T, Mod 1 | 01/21/2006 | | \$ | \$760,884 | | | \$113,325 | 02/17/2006 | 01/20/2007 |
| | TOTAL | | | | \$10,988,983 | | | \$4,985,874 | | |

* Represents the estimated cost subject to FAR 52.232-22 entitled "Limitation of Funds" and NFS 1852.232-81 "Contract Funding"

** Represents the period of performance it is estimated the allotted funds will cover

| | | | | |
|---|--|--|--------------------------------|--|
| AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT | | | 11. CONTRACT ID CODE | PAGE 1 OF 2 PAGE(S) |
| 2. AMENDMENT/MODIFICATION NO. 2 | 3. EFFECTIVE DATE See Block 16c below | 4. REQUISITION/PURCHASE REQ. NO. See Block 12 below | 5. PROJECT NO. (If applicable) | |
| 6. ISSUED BY National Aeronautics and Space Administration Langley Research Center Hampton, VA 23681-2199 | | 7. ADMINISTERED BY (If other than Item 6) CODE | | |
| 8. NAME AND ADDRESS OF CONTRACTOR (No. Street, county, State and ZIP Code) SCIENCE APPLICATIONS INTERNATIONAL CORPORATION 10260 CAMPUS POINT DRIVE SAN DIEGO, CA 92121 ATTN: [REDACTED] | | | (4) | 9A. AMENDMENT OF SOLICITATION NO. |
| CODE: 0T5L1 FACILITY CODE | | | | 9B. DATED (SEE ITEM 11) January 21, 2006 |
| | | | X | 10A. MODIFICATION OF CONTRACT/ORDER NO. NNL05AA01B / NNL06AA77T |
| | | | | 10B. DATED (SEE ITEM 13) |

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS.

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended, is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing items 9 and 16, and returning one (1) copy of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATA SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and data specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

PR: 4200149120 \$121,151 (COMPLETE)
PR: 4200149554 \$74,657 (COMPLETE)

TOTAL FUNDING INCREASE: \$195,808

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(4) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT/ORDER NO. IN ITEM 10A.

B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).

C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

D. OTHER (Specify type of modification and authority)

X FAR 52.243-2, CHANGES - COST-REIMBURSEMENT (ALTERNATE V) (APR 1984)

E. IMPORTANT: Contractor is not, is required to sign this document and return 1 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to revise the Statement of Work (SOW), order value (Block 17 of the OF347), and the estimated funded through date. Accordingly, the task order terms and conditions are revised as follows:

(CONTINUED)

Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as herebefore changed, remains unchanged and in full force and effect.

| | | | | | |
|---|--|-----------------------------------|---|--|-------------------------------|
| 15A. NAME AND TITLE OF SIGNER (Type or print) SARAH CAMPBELL SENIOR CONTRACTS MANAGER | 15B. CONTRACTOR/OFFICER (Signature) <i>Sarah Campbell</i> | 15C. DATE SIGNED 15 March 2006 | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) DARLA J. CLIFTON CONTRACTING OFFICER | 16B. UNITED STATES OF AMERICA (Signature) <i>Darla J. Clifton</i> | 16C. DATE SIGNED 3/15/2006 |
|---|--|-----------------------------------|---|--|-------------------------------|

NSN 7540-01-182-8070 PREVIOUS EDITION UNUSABLE

30-105 Computer Generated

STANDARD FORM 30 (REV. 10-83) Prescribed by GSA FAR (48 CFR) 53.243

1. The SOW provided in the original task order award is replaced with the version attached (Attachment 1).
2. As a result of the revisions to the SOW, the order value amounts listed in Paragraph 17 of the OF347 are revised as follows:

17f: Estimated Cost: [REDACTED]
 Fixed Fee: [REDACTED]
 Total Cost Plus Fixed Fee: \$956,692

17i: Grand Total: \$956,692 (increase of \$195,808)

3. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

"CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for **NNL06AA77T** and covers the following estimated period of performance: **January 21, 2006 through April 15, 2006.**

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)"

4. All other terms and conditions remain unchanged.

SUMMARY OF TASK ORDER VALUE / FUNDING

| TASK ORDER DOCUMENT | TASK VALUE SUMMARY | | | TASK FUNDING SUMMARY | | |
|---------------------|--------------------|------------|------------|----------------------|------------|------------|
| | ESTIMATED COST | FIXED FEE | TOTAL CPFF | ESTIMATED COST | FIXED FEE | TOTAL CPFF |
| BASIC | [REDACTED] | [REDACTED] | \$727,164 | [REDACTED] | [REDACTED] | \$80,000 |
| MOD 1 | [REDACTED] | [REDACTED] | \$760,884 | [REDACTED] | [REDACTED] | \$113,325 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$309,133 |

**Science Applications International Corporation (SAIC)
Contract NNL05AA01B
Task Order Statement of Work**

1. **Task Order Title:** NESC Support to Crew Exploration Vehicle (CEV) and Crew Launch Vehicle (CLV) Projects

2. **Contractual References:**
 - 2.1 **Statement of Work Reference:** This requirement is pursuant to contract NNL05AA01B, between NASA Langley Research Center and Science Applications International Corporation. Refer to Paragraph 3.0, Proposal and Mission Concept Evaluations; and Paragraph 5.0, Studies of the basic contract Statement of Work.

 - 2.2 **Limitation of Future Contracting:** This task shall require elements of systems engineering work, development of specifications and statements of work, and evaluations of proposals and competitive announcements, as set forth in Clause H.11, Limitation of Future Contracting (NASA Clause 1852.209-71), contained in contract NNL05AA01B. As the resultant independent design for the CEV (including the Command Module, Service Module, and the Launch Abort System) and CLV shall be used by the CEV and CLV Projects and the CEV and CLV Source Selection teams to assist in development of specifications and statements of work, and evaluations of proposals and competitive announcements, the contractor shall be required to comply with Clause H.17, Handling of Data, contained in contract NNL05AA01B.

3. **Purpose, Objective, and Background of Work to be Performed:** NASA is currently undergoing a transformation to manage the work ahead in pursuit of the President's Vision for Space Exploration. The Administrator desires to rekindle the Agency's capacity to be "good stewards" of the design, development, test, and evaluation process in support of future flight systems. To that end, the Agency must develop the "self-knowledge" of our strengths and weaknesses within NASA. The NESC is currently supporting this effort through the following activities and has identified requirements for subject matter experts in support of these activities.
 - 3.1 At the request of the Administrator, the NESC has initiated an intra-agency team to develop an independent design for the CEV including the Command Module, Service Module, and the Launch Abort System. This independent design will be used by the CEV Project and the CEV Source Selection team to assist in the evaluation of contractor proposals. This will allow substantial agency-wide penetration into the design challenges faced with the CEV procurement providing opportunities for our Agency team to better assess competing bids from our commercial responders. The team will brainstorm, prioritize and complete the trade studies, design improvements and additional design details needed to ensure the final product is an innovative approach for a CEV design. In support of this task, a number of Subsystem Design Teams will be formed.

The contractor shall participate as a member of the CEV Smart Buyer Design Process Subteam by providing expert consultations and lessons learned based on their experiences from Apollo era programs. The contractor shall participate in the brainstorming sessions to identify possible design improvements, necessary trade studies, and critical subsystems that warrant additional design detail. The contractor shall participate in the evaluation and prioritization of design work. Once the prioritized list of design improvements and trade studies has been determined, the corresponding Subsystem Design Teams will be established to complete the necessary design work.

- 3.2** The contractor shall participate as a member of the CEV Smart Buyer Design Process Structures Discipline Subteam by providing expert consultation related to Command Module (CM) landing impact analysis trade studies and the effect of landing loads on CM structure.

In the landing of the CM onto either earth or water, transient loads will be transmitted into the lower structure. These dynamic loads can range up to 20 - 40 g's or more, but are of short duration. Rigid capsule impact studies onto earth or water are only a starting point. The effect of dynamic loads on the CM structure and crew can be assessed using LS-DYNA, a general-purpose, nonlinear, dynamic finite-element code. LS-DYNA can be used to simulate most any type of dynamic event, from large-scale car or aircraft crashes, to component analysis of parachutes, airbags, and dummy and seating systems. A total systems approach is needed to help understand how the components of the CM will interact during a range of landing events.

- 3.3** The contractor shall participate as a member of the CEV Smart Buyer Design Process Launch Abort System Subteam to provide high fidelity modeling of the CEV LAS system in a two-part study. The model shall include the event of a detonation in the second stage intertank region, to determine effects on the CM.

In the first part of the study, for a Crew Launch Vehicle (CLV) configured with a 5-segment solid first stage and with a J-2 second stage, the contractor shall perform modeling activities resulting in predictions of overpressures on the CM of the Crew Exploration Vehicle (CEV) for a range of conditions. The CM shall have a 16.5 foot base diameter, and shall have specified design for the CEV system based on a configuration selected by the CEV smart buyer team. The model shall have geometrically correct simulation of the CLV and CEV. The model shall be highly time dependent in order to capture blast wave propagation, and shall use the reference trajectory for the 5-segment CLV with a J-2 second stage. The model shall have the capability of predicting overpressures on the CM for specified failure modes of the first or second stage of the CLV resulting in detonations at the location of the second stage intertank region. The objective is to specify realistic detonation energy content (TNT equivalent) at this location, and vary the detonation strength parametrically. This shall be done for specified points in the reference trajectory including, at a minimum, on pad, maximum dynamic pressure, and second stage ignition. For each case, the pressures on the CM shall be computed. This shall be done for the case of the CM remaining attached to the vehicle in order to understand where in parameter space the need to abort exists. Results of the study shall be available in time to help

determine the performance requirements of the launch abort system in the configuration (or 2 configurations) representing the final design solution(s) for the CEV smart buyers study.

For the second part, the contractor shall initiate the abort at specified time delays after a detonation. These time delays shall represent total time required for sensing the condition, reporting, deciding, and igniting the abort motors. The trajectory of the CM shall be modeled using realistic geometry, aerodynamic, thrust, and mass properties. The interaction of the blast wave with the ejected CM/LAS system shall be computed in order to better understand the survivability of a CM given the specified blast conditions and CM/LAS trajectory away from the vehicle. These computations would be extensions of the set of cases described in the first study, and the need to do these calculations would depend on results from the first study.

- 3.4 The NESC will also be providing support to ongoing CEV activities at the request of the Exploration Sciences Mission Directorate and will require senior-level consulting in support of these activities which are yet to be determined.
- 3.5 Recent activities, particularly exploration initiatives, within the agency have renewed interest in "best practices" for designing reliable spacecraft systems. The NESC has been requested to study and report out on design and verification methodologies for maximizing and assessing critical spacecraft system reliability. The objective of this Reliability of Critical Spacecraft Systems assessment is to bring reliability subject matter experts, subsystem/discipline/domain experts and systems engineering experts together to synthesize the current "best practices" in critical spacecraft system reliability. The activity will not only address the design element of reliability, but will also investigate other key facets integral to system reliability, such as, test and verification methodologies for demonstration of reliability and appropriate tools for the assessment and quantification of system reliability.

The Contractor shall support efforts to integrate and document "Best Practice" aspects of designing, verifying and quantifying the reliability of spacecraft systems. The scope will require data on historical system performance, lessons learned from previous efforts and benchmarking outside the agency on organizations and programs with responsibilities for safety of comparable or greater magnitude. Historical systems will include both heritage NASA systems and other critical systems as applicable (e.g., military, commercial aerospace, etc.). Lessons learned will span formal agency lessons learned databases, as well as corporate knowledge from agency experts. Other high reliability organizations outside of NASA will be benchmarked to measure and challenge our design, test and assessment methodologies. The scope will encompass several critical subsystems and disciplines including:

- Structures
- Avionics
- Software
- Guidance, Navigation and Control
- Propulsion
- Life Support and Active Thermal Control
- Mechanisms
- Human Factors
- Materials

Overarching Systems Engineering guidelines and methodologies will also be addressed as a part of this assessment. Additional subsystems, or categories within subsystems, may be added during the assessment if merited based on the uniqueness of the domain area and the approach for reliable design.

- 3.6 The baseline CLV vehicle configuration identified in the Exploration Systems Architecture Study (ESAS) requires an update to meet project system requirements. An interim concept extends the upper stage by approximately 22.5 feet through a combination of increases in the oxidizer and fuel tank length and the insertion of a forward skirt to the first stage. The CLV Project Office has requested NESC support in determining if the proposed length increase has any known first order design barriers or limits that require resolution prior to the investment of considerable analysis refinement. The NESC has assembled an independent team of structures and guidance, navigation and control experts to identify any known issues that would preclude the continuance of the analysis phase. This information is needed as a precursor for a commitment to detailed design and to influence the simulated upper stage design of the CLV Development Test Flight (DTF)-1.
- 3.7 The contractor shall participate as a member of the NESC CLV Insight Team to provide technical area expert review of the preliminary design for the CLV in the areas of vehicle layout and design, structures, structural dynamics and loads, ascent flight dynamics and design, and interaction with vehicle flight control system. The contractor shall consider all flight phases such as ground handling and pre-launch, liftoff, ascent, engine cutoff, staging, and recovery of any reusable elements.
- 3.8 The current concept is a five segment solid propellant first stage and a J-2X powered second stage. The first stage booster is a Space Shuttle derivative of the four segment Solid Rocket Booster. The J-2X envisioned as an expander cycle engine with an 80:1 expansion nozzle that utilizes components from both the J-2 and the J-2S. The second stage diameter is approximately 5.5 meter to match the current Crew Exploration Vehicle (CEV) concept. However, ongoing design trade studies are considering alternative CEV diameters. Changes to the CEV will cascade into modifications to the CLV design. The current 5.5 meter second stage has a present height of approximately 94 meter and a gross liftoff weight (GLOW) of approximately 910,000 kilogram. The CLV Project Office and the NESC Director have requested NESC establish a long-term technical insight partnership of a core group of discipline experts to provide critical review of ongoing design concepts, development manufacturing models, and operational practices. The NESC has assembled an

independent core team of system engineers, propulsion, environments, structures, manufacturing, and guidance, navigation and control (GN&C) experts to provide a sustaining level of insight through the CLV Critical Design Review (CDR) phase. The initial duration of this task will be for calendar year 2006 and include Systems Requirements Reviews (SRRs) for the vehicle integration, first stage, and second stage structure, engine and avionics.

4. **Description of the Work to be Performed:** The Contractor shall perform the following task requirements:
 - 4.1 **CEV Smart Buyer Design Process Subteam Support**
 - 4.1.1 The contractor shall provide general expertise, consulting and product review through telecons, and occasional face-to-face meetings.
 - 4.1.2 The contractor shall participate in the CEV Smart Buyer Design Process core team kickoff meeting.
 - 4.1.3 The contractor shall participate in follow-on teleconferences and team meetings as requested.
 - 4.2 **LS-DYNA Support**
 - 4.2.1 The contractor shall provide general expertise, consulting and product review through telecons, and occasional face-to-face meetings.
 - 4.2.2 The contractor shall participate in teleconferences and team meetings as requested.
 - 4.2.3 The contractor shall perform analysis using LS-DYNA as required.
 - 4.3 **Launch Abort System (LAS) Support**
 - 4.3.1 The contractor shall provide general expertise, consulting and product review through telecons, and occasional face-to-face meetings.
 - 4.3.2 The contractor shall participate in teleconferences and team meetings as requested.
 - 4.4 **NESC Support to CEV Activities**
 - 4.4.1 The contractor shall attend and participate in key program reviews such as Systems Requirements Reviews, Preliminary Design Reviews, or Critical Design Reviews, as required.

- 4.4.2 The contractor shall participate in telecons as required.
- 4.4.3 The contractor shall provide independent assessment of CEV approaches, plans and technical products.
- 4.4.4 The contractor shall provide recommendations for additional efforts where required.
- 4.4.5 The contractor, as required, shall work with independent NESC teams to conduct value added analysis and/or test as required to support and assess the CEV Project.
- 4.4.6 The contractor, as required, shall work with other senior-level engineering teams.
- 4.4.7 The contractor shall support meetings including the conduct of briefings, as required. Most product review activities will be conducted at the contractor's home site with occasional face-to-face meetings. Major reviews will be conducted at the Johnson Space Center. The contractor shall perform travel as required to support these meetings.
- 4.4.8 This support will require the ability to independently penetrate into program technical team activities, articulate deficiencies (in writing) and develop risk mitigation approaches.

4.5 Reliability of Critical Spacecraft Systems Assessment

- 4.5.1 Historical Systems Performance Review. The contractor shall support and conduct the research and assessment of historical NASA and other applicable systems.
- 4.5.2 Lessons-Learned. The contractor shall support the acquisition and review of lessons-learned from heritage NASA programs, review data from the Agency lessons-learned database, and solicit/review/analyze systems level lessons-learned.
- 4.5.3 External Benchmarking. The contractor shall support and conduct external benchmarking activities including the assessment of requirements generation and application, conduct of trade studies, design and test standards, performance history, and lessons learned.
- 4.5.4 Develop Requirements and Standards Reference. The contractor shall support the development of an initial Requirements and Standards Reference for NASA.

- 4.5.5 Synthesize and Document Findings. The contractor shall perform analysis and document results for incorporation into final project documentation. As required, the contractor shall develop briefings, graphics, and other documents as required.
- 4.5.6 Provide Subject Matter Experts. The contractor shall, as required, provide subject matter experts within 5 business days of the requirement. This includes all authorizations to travel and certifications for service including certification of no conflict of interest.
- 4.5.7 The contractor shall participate in teleconferences and team meetings as requested. The contractor shall participate in weekly telecons and face-to-face meetings as scheduled in support of the Reliability of Critical Spacecraft Systems assessment team.
- 4.5.8 Meeting Support. The contractor shall support meetings including the conduct of briefings, as required. Meeting logistics support shall be provided as required.
- 4.5.9 Travel. The contractor shall perform travel as required to perform data acquisition, analysis, documentation, meeting and briefing support.

4.6 NESC Support to CLV Activities

- 4.6.1 The contractor shall perform a critical review of the CLV preliminary design for acceptability to proceed to a detailed design cycle and identify areas of concern that may require modification, redesign, special analysis, additional data, or return to preliminary design for resolution.
- 4.6.2 The contractor shall participate in required team telecons and face to face meetings and contribute to preparation of final team report and briefing charts.
- 4.6.3 The contractor shall perform travel as required to perform data acquisition, analysis, documentation, meeting and briefing support.
- 4.6.4 The contractor shall interface with NESC CLV Insight and the CLV Project Upper (second) Stage manufacturing teams to perform critical review and planning of the CLV preliminary design for development manufacturing concepts at the Marshall Space Flight Center. Task to include review of first to second stage interface, second stage structure, and second stage to CEV interface and identify areas of concern that may require modification, redesign, special analysis, additional data, or return to preliminary design for resolution.

5. **Deliverables:**

5.1 **CEV Smart Buyer Design Process**

5.1.1 Monthly Reports: The contractor shall provide monthly reports summarizing all contracted activities, expenses to date, and funds remaining.

5.2 **LS-DYNA Support**

5.2.1 Reports: The contractor shall provide written reports of findings and recommendations as required.

5.2.2 Final Report Inputs: The contractor shall provide all inputs to final reports and briefings as required to meet final out briefings to NASA stakeholders.

5.3 **LAS Support**

5.3.1 Reports: The contractor shall provide written reports of findings and recommendations as required.

5.3.2 Final Report Inputs: The contractor shall provide all inputs to final reports and briefings as required to meet final out briefings to NASA stakeholders.

5.4 **NESC Support to CEV Activities**

5.4.1 Reports: The contractor shall provide written reports of findings and recommendations as required.

5.4.2 Final Report Inputs: The contractor shall provide all inputs to final reports and briefings as required to meet final out briefings to NASA stakeholders.

5.5 **Reliability of Critical Spacecraft Systems Assessment**

5.5.1 Monthly Reports: The contractor shall provide monthly reports summarizing all contracted activities, expenses to date, and funds remaining.

5.5.2 Final Report Inputs: The contractor shall provide all inputs to the final report and briefing as required to meet the final out briefing to NASA stakeholders.

5.6 **NESC Support to CLV Activities**

5.6.1 The contractor shall provide all inputs to the final report and briefing as required to meet the final out briefing to NASA stakeholders.

6. **Government Furnished Items:** Trajectory data and plots for high fidelity modeling of the CEV LAS system.
7. **Other Information Needed for Task Performance:** Data on the CEV and CLV Programs.
8. **Period of Performance/Schedule:** The period of performance for this task order is January 21, 2006 through January 20, 2007. Milestones are outlined below:

| Milestone Number | SOW Paragraph | Milestones | Dates |
|------------------|----------------|--|------------|
| 1 | * | Task Order Start Date | [REDACTED] |
| 2 | 5.1.1 | CEV Smart Buyer Design Process Core Team Kickoff Meeting | [REDACTED] |
| 3 | 4.5.2 | CLV Technical Interchange Meeting | [REDACTED] |
| 4 | 4.5.2 & 5.4.1 | Input Required for Final Report and Briefing Charts | [REDACTED] |
| 5 | 5.3.1 | Monthly Technical Reports | [REDACTED] |
| 6 | 5.3.2 | Critical Spacecraft Systems Assessment - Final Report Delivery | [REDACTED] |
| 7 | 4.1, 4.2 & 4.3 | Completion of Subtask for CEV Smart Buyer Design Process | [REDACTED] |
| 8 | 4.5.2 | Final Report Generation for CLV Insight | [REDACTED] |
| 9 | * | Task Order Completion Date | [REDACTED] |

Changes to interim delivery dates shall be coordinated with and approved by the Task Monitor. Changes to the completion date must be approved by the Contracting Officer.

9. **NASA Task Monitor**

PRIMARY NASA TM: Kimberly A. Cannon
 Mail Stop (M/S): 105, Langley Research Center
 Phone Number: (757) 864-3814 / Fax Number: (757) 864-1388
 E-Mail Address: Kimberly.a.cannon@nasa.gov

ALTERNATE NASA TM: Cynthia L. Bruno
 Mail Stop (M/S): 105, Langley Research Center
 Phone Number: (757) 864-6065 / Fax Number: (757) 864-1388
 E-Mail Address: Cynthia.L.Bruno@nasa.gov

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
PAGE 1 OF PAGE(S) 2
2. AMENDMENT/MODIFICATION NO. 3
3. EFFECTIVE DATE See Block 16c below.
4. REQUISITION/PURCHASE REQ. NO. See Block 12 below.
5. PROJECT NO. (If applicable)

6. ISSUED BY
CODE
**National Aeronautics and Space Administration
Langley Research Center
Hampton, VA 23681-2199**
7. ADMINISTERED BY (If other than Item 6)
CODE

8. NAME AND ADDRESS OF CONTRACTOR (No. Street, county, State and ZIP Code)
**SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
10260 CAMPUS POINT DRIVE
SAN DIEGO, CA 92121
ATTN: [REDACTED]**
9A. AMENDMENT OF SOLICITATION NO.
9B. DATED (SEE ITEM 11)
10A. MODIFICATION OF CONTRACT/ORDER NO.
NNL05AA01B / NNL06AA77T
10B. DATED (SEE ITEM 13)
January 21, 2006
CODE 0T5L1 FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers is extended, is not extended.
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:
(a) By completing items 8 and 15, and returning one (1) copy of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATA SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and data specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
PR: 4200179492 \$50,000 (COMPLETE)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
 B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
 C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
 D. OTHER Specify type of modification and authority
X FAR 52.232-22, LIMITATION OF FUNDS (APRIL 1984)

E. IMPORTANT: Contractor is not, is required to sign this document and return 1 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to provide incremental funding in the amount of \$50,000. Accordingly, the task order terms and conditions are revised as follows:

(CONTINUED)

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)
15B. CONTRACTOR/OFFEROR
15C. DATE SIGNED
16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)
**DARLA J. CLIFTON
CONTRACTING OFFICER**
16B. UNITED STATES OF AMERICA
BY **Darla J Clifton**
(Signature of Contracting Officer)
16C. DATE SIGNED
Sep 29, 2006
(Signature of person authorized to sign)

1. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

“CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for **NNL06AA77T** and covers the following estimated period of performance: **January 21, 2006 through November 30, 2006.**

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)”

2. All other terms and conditions remain unchanged.

SUMMARY OF TASK ORDER VALUE / FUNDING

| TASK ORDER DOCUMENT | TASK VALUE SUMMARY | | | TASK FUNDING SUMMARY | | |
|---------------------|--------------------|------------|------------|----------------------|------------|------------|
| | ESTIMATED COST | FIXED FEE | TOTAL CPFF | ESTIMATED COST | FIXED FEE | TOTAL CPFF |
| BASIC | [REDACTED] | [REDACTED] | \$727,164 | [REDACTED] | [REDACTED] | \$80,000 |
| MOD 1 | [REDACTED] | [REDACTED] | \$760,884 | [REDACTED] | [REDACTED] | \$113,325 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$309,133 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$359,133 |

NOTE: Period of Performance for this task order is January 21, 2006 through January 20, 2007.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE
PAGE 1 OF 2 PAGE(S)

2. AMENDMENT/MODIFICATION NO. 4
3. EFFECTIVE DATE See Block 16c below
4. REQUISITION/PURCHASE REQ. NO. See Block 12 below
5. PROJECT NO. (If applicable)

6. ISSUED BY
CODE
National Aeronautics and Space Administration
Langley Research Center
Hampton, VA 23681-2199
7. ADMINISTERED BY (If other than Item 6)
CODE

8. NAME AND ADDRESS OF CONTRACTOR (No. Street, county, State and ZIP Code)
SCIENCE APPLICATIONS INTERNATIONAL CORPORATION
10260 CAMPUS POINT DRIVE
SAN DIEGO, CA 92121
ATTN: [REDACTED]
(4)
9A. AMENDMENT OF SOLICITATION NO.
9B. DATED (SEE ITEM 11)
10A. MODIFICATION OF CONTRACT ORDER NO.
X NNLO5A A01B / NNLO6A A77T
10B. DATED (SEE ITEM 13)
January 21, 2006
CODE 0T5L1 FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of offers is extended, is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:
(a) By completing items 8 and 15, and returning one (1) copy of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
PR: 4200180913 \$100,000 (COMPLETE)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(4) A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(D).
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
D. OTHER (Specify type of modification and authority):
X FAR 52.243-2, CHANGES - COST REIMBURSEMENT (ALTERNATE V) (APR 1984)

E. IMPORTANT: Contractor is not, is required to sign this document and return 1 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UOP section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to revise the Statement of Work (SOW) and the estimated funded through date. Accordingly, the task order terms and conditions are revised as follows:

(CONTINUED)

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remain unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)
SARAH CAMPBELL
SENIOR CONTRACTS MANAGER
15B. CONTRACTING OFFICER
15C. DATE SIGNED
12/19/06
16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)
DARLA J. CLIFTON
CONTRACTING OFFICER
16B. UNITED STATES OF AMERICA
BY Darla J. Clifton
16C. DATE SIGNED
12/19/06

1. The SOW provided in the original task order award is replaced with the version attached (Attachment 1).
2. The task order value remains unchanged at \$956,692 (Cost: [REDACTED] and Fee: [REDACTED]).
3. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

"CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for **NNL06AA77T** and covers the following estimated period of performance: **January 21, 2006 through January 31, 2007.**

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)"

4. All other terms and conditions remain unchanged.

SUMMARY OF TASK ORDER VALUE / FUNDING

| TASK ORDER DOCUMENT | TASK VALUE SUMMARY | | | TASK FUNDING SUMMARY | | |
|---------------------|--------------------|---------------|------------|----------------------|------------|------------|
| | ESTIMATED COST | FIXED FEE | TOTAL CPFF | ESTIMATED COST | FIXED FEE | TOTAL CPFF |
| BASIC | [REDACTED] | \$ [REDACTED] | \$727,164 | [REDACTED] | [REDACTED] | \$80,000 |
| MOD 1 | [REDACTED] | [REDACTED] | \$760,884 | [REDACTED] | [REDACTED] | \$113,325 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$309,133 |
| MOD 3 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$359,133 |
| MOD 4 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$459,133 |

NOTE: Period of Performance for this task order is January 21, 2006 through July 20, 2007.

**Science Applications International Corporation (SAIC)
Contract NNL05AA01B
Task Order Statement of Work**

1. **Task Order Title:** NESC Support to Crew Exploration Vehicle (CEV) and Crew Launch Vehicle (CLV) Projects
2. **Contractual References:**
 - 2.1 **Statement of Work Reference:** This requirement is pursuant to contract NNL05AA01B, between NASA Langley Research Center and Science Applications International Corporation. Refer to Paragraph 3.0, Proposal and Mission Concept Evaluations; and Paragraph 5.0, Studies of the basic contract Statement of Work.
 - 2.2 **Limitation of Future Contracting:** This task shall require elements of systems engineering work, development of specifications and statements of work, and evaluations of proposals and competitive announcements, as set forth in Clause H.11, Limitation of Future Contracting (NASA Clause 1852.209-71), contained in contract NNL05AA01B. As the resultant independent design for the CEV (including the Command Module, Service Module, and the Launch Abort System) and CLV shall be used by the CEV and CLV Projects and the CEV and CLV Source Selection teams to assist in development of specifications and statements of work, and evaluations of proposals and competitive announcements, the contractor shall be required to comply with Clause H.17, Access to Sensitive Information (NFS 1852.237-72); Exhibit D, Organizational Conflict of Interest Avoidance Plan, contained in contract NNL05AA01B (including requiring personnel to certify both an Acknowledgement of Rules for Information Handling and Communication Control (*for contractor employees supporting the CEV Smart Buyer Design Team*) and a Disclosure of Disqualifying Conflicts of Interest).
3. **Purpose, Objective, and Background of Work to be Performed:** NASA is currently undergoing a transformation to manage the work ahead in pursuit of the President's Vision for Space Exploration. The Administrator desires to rekindle the Agency's capacity to be "good stewards" of the design, development, test, and evaluation process in support of future flight systems. To that end, the Agency must develop the "self-knowledge" of our strengths and weaknesses within NASA. The NESC is currently supporting this effort through the following activities and has identified requirements for subject matter experts in support of these activities.
 - 3.1 At the request of the Administrator, the NESC has initiated an intra-agency team to develop an independent design for the CEV including the Command Module, Service Module, and the Launch Abort System. This independent design will be used by the CEV Project and the CEV Source Selection team to assist in the evaluation of contractor proposals. This will allow substantial agency-wide penetration into the design challenges faced with the CEV procurement providing opportunities for our Agency team to better assess competing bids from our commercial responders. The team will brainstorm, prioritize and complete the trade studies, design improvements

and additional design details needed to ensure the final product is an innovative approach for a CEV design. In support of this task, a number of Subsystem Design Teams will be formed.

The contractor shall participate as a member of the CEV Smart Buyer Design Process Subteam by providing expert consultations and lessons learned based on their experiences from Apollo era programs. The contractor shall participate in the brainstorming sessions to identify possible design improvements, necessary trade studies, and critical subsystems that warrant additional design detail. The contractor shall participate in the evaluation and prioritization of design work. Once the prioritized list of design improvements and trade studies has been determined, the corresponding Subsystem Design Teams will be established to complete the necessary design work.

- 3.2 The contractor shall participate as a member of the CEV Smart Buyer Design Process Structures Discipline Subteam by providing expert consultation related to Command Module (CM) landing impact analysis trade studies and the effect of landing loads on CM structure.

In the landing of the CM onto either earth or water, transient loads will be transmitted into the lower structure. These dynamic loads can range up to 20 - 40 g's or more, but are of short duration. Rigid capsule impact studies onto earth or water are only a starting point. The effect of dynamic loads on the CM structure and crew can be assessed using LS-DYNA, a general-purpose, nonlinear, dynamic finite-element code. LS-DYNA can be used to simulate most any type of dynamic event, from large-scale car or aircraft crashes, to component analysis of parachutes, airbags, and dummy and seating systems. A total systems approach is needed to help understand how the components of the CM will interact during a range of landing events.

- 3.3 The contractor shall participate as a member of the CEV Smart Buyer Design Process Launch Abort System Subteam to provide high fidelity modeling of the CEV LAS system in a two-part study. The model shall include the event of a detonation in the second stage intertank region, to determine effects on the CM.

In the first part of the study, for a Crew Launch Vehicle (CLV) configured with a 5-segment solid first stage and with a J-2 second stage, the contractor shall perform modeling activities resulting in predictions of overpressures on the CM of the Crew Exploration Vehicle (CEV) for a range of conditions. The CM shall have a 16.5 foot base diameter, and shall have specified design for the CEV system based on a configuration selected by the CEV smart buyer team. The model shall have geometrically correct simulation of the CLV and CEV. The model shall be highly time dependent in order to capture blast wave propagation, and shall use the reference trajectory for the 5-segment CLV with a J-2 second stage. The model shall have the capability of predicting overpressures on the CM for specified failure modes of the first or second stage of the CLV resulting in detonations at the location of the second stage intertank region. The objective is to specify realistic detonation energy content (TNT equivalent) at this location, and vary the detonation strength parametrically. This shall be done for specified points in the reference trajectory including, at a

minimum, on pad, maximum dynamic pressure, and second stage ignition. For each case, the pressures on the CM shall be computed. This shall be done for the case of the CM remaining attached to the vehicle in order to understand where in parameter space the need to abort exists. Results of the study shall be available in time to help determine the performance requirements of the launch abort system in the configuration (or 2 configurations) representing the final design solution(s) for the CEV smart buyers study.

For the second part, the contractor shall initiate the abort at specified time delays after a detonation. These time delays shall represent total time required for sensing the condition, reporting, deciding, and igniting the abort motors. The trajectory of the CM shall be modeled using realistic geometry, aerodynamic, thrust, and mass properties. The interaction of the blast wave with the ejected CM/LAS system shall be computed in order to better understand the survivability of a CM given the specified blast conditions and CM/LAS trajectory away from the vehicle. These computations would be extensions of the set of cases described in the first study, and the need to do these calculations would depend on results from the first study.

- 3.4 The NESC will also be providing support to ongoing CEV activities at the request of the Exploration Sciences Mission Directorate and will require senior-level consulting in support of these activities which are yet to be determined.
- 3.5 Recent activities, particularly exploration initiatives, within the agency have renewed interest in "best practices" for designing reliable spacecraft systems. The NESC has been requested to study and report out on design and verification methodologies for maximizing and assessing critical spacecraft system reliability. The objective of this Reliability of Critical Spacecraft Systems assessment is to bring reliability subject matter experts, subsystem/discipline/domain experts and systems engineering experts together to synthesize the current "best practices" in critical spacecraft system reliability. The activity will not only address the design element of reliability, but will also investigate other key facets integral to system reliability, such as, test and verification methodologies for demonstration of reliability and appropriate tools for the assessment and quantification of system reliability.

The Contractor shall support efforts to integrate and document "Best Practice" aspects of designing, verifying and quantifying the reliability of spacecraft systems. The scope will require data on historical system performance, lessons learned from previous efforts and benchmarking outside the agency on organizations and programs with responsibilities for safety of comparable or greater magnitude. Historical systems will include both heritage NASA systems and other critical systems as applicable (e.g., military, commercial aerospace, etc.). Lessons learned will span formal agency lessons learned databases, as well as corporate knowledge from agency experts. Other high reliability organizations outside of NASA will be benchmarked to measure and challenge our design, test and assessment methodologies. The scope will encompass several critical subsystems and disciplines including:

- Structures
- Avionics
- Software
- Guidance, Navigation and Control
- Propulsion
- Life Support and Active Thermal Control
- Mechanisms
- Human Factors
- Materials

Overarching Systems Engineering guidelines and methodologies will also be addressed as a part of this assessment. Additional subsystems, or categories within subsystems, may be added during the assessment if merited based on the uniqueness of the domain area and the approach for reliable design.

- 3.6 The baseline CLV vehicle configuration identified in the Exploration Systems Architecture Study (ESAS) requires an update to meet project system requirements. An interim concept extends the upper stage by approximately 22.5 feet through a combination of increases in the oxidizer and fuel tank length and the insertion of a forward skirt to the first stage. The CLV Project Office has requested NESC support in determining if the proposed length increase has any known first order design barriers or limits that require resolution prior to the investment of considerable analysis refinement. The NESC has assembled an independent team of structures and guidance, navigation and control experts to identify any known issues that would preclude the continuance of the analysis phase. This information is needed as a precursor for a commitment to detailed design and to influence the simulated upper stage design of the CLV Development Test Flight (DTF)-1.
- 3.7 The contractor shall participate as a member of the NESC CLV Insight Team to provide technical area expert review of the preliminary design for the CLV in the areas of vehicle layout and design, structures, structural dynamics and loads, ascent flight dynamics and design, and interaction with vehicle flight control system. The contractor shall consider all flight phases such as ground handling and pre-launch, liftoff, ascent, engine cutoff, staging, and recovery of any reusable elements.
- 3.8 The current concept is a five segment solid propellant first stage and a J-2X powered second stage. The first stage booster is a Space Shuttle derivative of the four-segment Solid Rocket Booster. The J-2X envisioned as an expander cycle engine with an 80:1 expansion nozzle that utilizes components from both the J-2 and the J-2S. The second stage diameter is approximately 5.5 meter to match the current Crew Exploration Vehicle (CEV) concept. However, ongoing design trade studies are considering alternative CEV diameters. Changes to the CEV will cascade into modifications to the CLV design. The current 5.5 meter second stage has a present height of approximately 94 meter and a gross liftoff weight (GLOW) of approximately 910,000 kilogram. The CLV Project Office and the NESC Director have requested NESC establish a long-term technical insight partnership of a core group of discipline experts to provide critical review of ongoing design concepts, development manufacturing models, and operational practices. The NESC has assembled an

independent core team of system engineers, propulsion, environments, structures, manufacturing, and guidance, navigation and control (GN&C) experts to provide a sustaining level of insight through the CLV Critical Design Review (CDR) phase. The initial duration of this task will be for calendar year 2006 and include Systems Requirements Reviews (SRRs) for the vehicle integration, first stage, and second stage structure, engine and avionics.

- 3.9** At the request of the CEV Project Office, the NASA Engineering and Safety Center (NESC) has initiated an intra-agency team to leverage on the risk analysis tools and modeling experience from the NESC's CEV Landing Assessment to support a trade study to evaluate landing and recovery for the NASA and Lockheed CEV architectures, including the parachute system, landing system, crew-couch attenuation system and other affected critical systems. This independent assessment will be used to inform the Project of vulnerabilities in design and ensure redundancy and risk mitigation in the design. The team will evaluate the existing design and mitigation options such that the Project can ensure that the necessary risk mitigation efforts are completed by the contractor. The initial qualitative findings will be the basis of the extended quantitative analysis that will lead to the final NESC recommendations.
- 3.10** The CLV First Stage Project has requested that NESC provide an independent assessment of the technical, reliability, operational, cost, and schedule impacts of a decision to move away from hydrazine for the CLV first stage TVC. The approach would include a review of the data from the Shuttle Upgrade program study, for which First Stage project personnel or others involved in the study will provide a presentation. The NESC assessment may include a review of the assessment that the CLV First Stage performed for the Transition Board.
- 4. Description of the Work to be Performed:** The Contractor shall perform the following task requirements:
- 4.1 CEV Smart Buyer Design Process Subteam Support**
- 4.1.1** The contractor shall provide general expertise, consulting and product review through telecons, and occasional face-to-face meetings.
- 4.1.2** The contractor shall participate in the CEV Smart Buyer Design Process core team kickoff meeting.
- 4.1.3** The contractor shall participate in follow-on teleconferences and team meetings as requested.
- 4.2 LS-DYNA Support**
- 4.2.1** The contractor shall provide general expertise, consulting and product review through telecons, and occasional face-to-face meetings.

4.2.2 The contractor shall participate in teleconferences and team meetings as requested.

4.2.3 The contractor shall perform analysis using LS-DYNA as required.

4.3 Launch Abort System (LAS) Support

4.3.1 The contractor shall provide general expertise, consulting and product review through telecons, and occasional face-to-face meetings.

4.3.2 The contractor shall participate in teleconferences and team meetings as requested.

4.4 NESC Support to CEV Activities

4.4.1 The contractor shall attend and participate in key program reviews such as Systems Requirements Reviews, Preliminary Design Reviews, or Critical Design Reviews, as required.

4.4.2 The contractor shall participate in telecons as required.

4.4.3 The contractor shall provide independent assessment of CEV approaches, plans and technical products.

4.4.4 The contractor shall provide recommendations for additional efforts where required.

4.4.5 The contractor, as required, shall work with independent NESC teams to conduct value added analysis and/or test as required to support and assess the CEV Project.

4.4.6 The contractor, as required, shall work with other senior-level engineering teams.

4.4.7 The contractor shall support meetings including the conduct of briefings, as required. Most product review activities will be conducted at the contractor's home site with occasional face-to-face meetings. Major reviews will be conducted at the Johnson Space Center. The contractor shall perform travel as required to support these meetings.

4.4.8 This support will require the ability to independently penetrate into program technical team activities, articulate deficiencies (in writing) and develop risk mitigation approaches.

4.4.9 The contractor will participate as a member of the CEV risk assessment team by providing expert consultations and lessons learned based on experience from Apollo era and other space programs. The contractor will participate in the brainstorming sessions to identify possible design improvements to mitigate risks, necessary trade studies, and critical subsystems that warrant additional design detail. The contractor will participate in the evaluation and prioritization of assessment work and perform other tasks as requested by the Team Lead.

4.5 Reliability of Critical Spacecraft Systems Assessment

- 4.5.1** Historical Systems Performance Review. The contractor shall support and conduct the research and assessment of historical NASA and other applicable systems.
- 4.5.2** Lessons-Learned. The contractor shall support the acquisition and review of lessons-learned from heritage NASA programs, review data from the Agency lessons-learned database, and solicit/review/analyze systems level lessons-learned.
- 4.5.3** External Benchmarking. The contractor shall support and conduct external benchmarking activities including the assessment of requirements generation and application, conduct of trade studies, design and test standards, performance history, and lessons learned.
- 4.5.4** Develop Requirements and Standards Reference. The contractor shall support the development of an initial Requirements and Standards Reference for NASA.
- 4.5.5** Synthesize and Document Findings. The contractor shall perform analysis and document results for incorporation into final project documentation. As required, the contractor shall develop briefings, graphics, and other documents as required.
- 4.5.6** Provide Subject Matter Experts. The contractor shall, as required, provide subject matter experts within 5 business days of the requirement. This includes all authorizations to travel and certifications for service including certification of no conflict of interest.
- 4.5.7** The contractor shall participate in teleconferences and team meetings as requested. The contractor shall participate in weekly telecons and face-to-face meetings as scheduled in support of the Reliability of Critical Spacecraft Systems assessment team.

4.5.8 Meeting Support. The contractor shall support meetings including the conduct of briefings, as required. Meeting logistics support shall be provided as required.

4.5.9 Travel. The contractor shall perform travel as required to perform data acquisition, analysis, documentation, meeting and briefing support.

4.6 NESC Support to CLV Activities

4.6.1 The contractor shall perform a critical review of the CLV preliminary design for acceptability to proceed to a detailed design cycle and identify areas of concern that may require modification, redesign, special analysis, additional data, or return to preliminary design for resolution.

4.6.2 The contractor shall participate in required team telecons and face to face meetings and contribute to preparation of final team report and briefing charts.

4.6.3 The contractor shall perform travel as required to perform data acquisition, analysis, documentation, meeting and briefing support.

4.6.4 The contractor shall interface with NESC CLV Insight and the CLV Project Upper (second) Stage manufacturing teams to perform critical review and planning of the CLV preliminary design for development manufacturing concepts at the Marshall Space Flight Center. Task to include review of first to second stage interface, second stage structure, and second stage to CEV interface and identify areas of concern that may require modification, redesign, special analysis, additional data, or return to preliminary design for resolution.

4.6.5 The contractor shall participate as a member on NESC's Crew Launch Vehicle Thrust Vector Control Propellant Options Assessment Team. As such, the Contractor shall provide the necessary manpower and expertise to participate in teleconferences and team meetings, provide expert advice and guidance to the team leader, complete action items as assigned and prepare appropriate sections of team reports and findings. Team meetings will be scheduled and coordinated by the team leader, and will be conducted mostly through teleconferencing.

5. Deliverables:

5.1 CEV Smart Buyer Design Process

5.1.1 Monthly Reports: The contractor shall provide monthly reports summarizing all contracted activities, expenses to date, and funds remaining.

5.2 LS-DYNA Support

5.2.1 Reports: The contractor shall provide written reports of findings and recommendations as required.

5.2.2 Final Report Inputs: The contractor shall provide all inputs to final reports and briefings as required to meet final out briefings to NASA stakeholders.

5.3 LAS Support

5.3.1 Reports: The contractor shall provide written reports of findings and recommendations as required.

5.3.2 Final Report Inputs: The contractor shall provide all inputs to final reports and briefings as required to meet final out briefings to NASA stakeholders.

5.4 NESC Support to CEV Activities

5.4.1 Reports: The contractor shall provide written reports of findings and recommendations as required.

5.4.2 Final Report Inputs: The contractor shall provide all inputs to final reports and briefings as required to meet final out briefings to NASA stakeholders.

5.5 Reliability of Critical Spacecraft Systems Assessment

5.5.1 Monthly Reports: The contractor shall provide monthly reports summarizing all contracted activities, expenses to date, and funds remaining.

5.5.2 Final Report Inputs: The contractor shall provide all inputs to the final report and briefing as required to meet the final out briefing to NASA stakeholders.

5.6 NESC Support to CLV Activities

5.6.1 The contractor shall provide all inputs to the final report and briefing as required to meet the final out briefing to NASA stakeholders.

6. **Government Furnished Items:** Trajectory data and plots for high fidelity modeling of the CEV LAS system.
7. **Other Information Needed for Task Performance:** Data on the CEV and CLV Programs.
8. **Period of Performance/Schedule:** The period of performance for this task order is January 21, 2006 through July 20, 2007. Milestones are outlined below:

| Milestone Number | SOW Paragraph | Milestones | Dates |
|------------------|----------------|---|------------|
| 1 | * | Task Order Start Date | [REDACTED] |
| 2 | 5.1.1 | CEV Smart Buyer Design Process Core Team Kickoff Meeting | [REDACTED] |
| 3 | 4.5.2 | CLV Technical Interchange Meeting | [REDACTED] |
| 4 | 4.5.2 & 5.4.1 | Input Required for Final Report and Briefing Charts | [REDACTED] |
| 5 | 5.3.1 | Monthly Technical Reports | [REDACTED] |
| 6 | 5.3.2 | Critical Spacecraft Systems Assessment - Final Report Delivery | [REDACTED] |
| 7 | 4.1, 4.2 & 4.3 | Completion of Subtask for CEV Smart Buyer Design Process | [REDACTED] |
| 8 | 4.5.2 | Final Report Generation for CLV Insight | [REDACTED] |
| 9 | 4.6.5 | Crew Launch Vehicle Thrust Vector Control Propellant Options Assessment Team Final Report | [REDACTED] |
| 10 | 4.4.9 | CEV Integrated Landing System Evaluation Final Report | [REDACTED] |
| 9 | * | Task Order Completion Date | [REDACTED] |

Changes to interim delivery dates shall be coordinated with and approved by the Task Monitor. Changes to the completion date must be approved by the Contracting Officer.

8. NASA Task Management:

Task Manager (TM)

TM: Chris Johansen

Mail Stop (M/S): 105, Langley Research Center

Phone Number: (757) 864-6077 / Fax Number: (757) 864-1388

E-Mail Address: Chris.Johansen@nasa.gov

Contracting Officer's Technical Representative (COTR)

COTR: Jennings B. Cherry

Mail Stop (M/S): Science Support Office – M/S 160

Phone Number: (757) 864-2465 / Fax Number: (757) 864-8894

E-Mail Address: Jennings.B.Cherry@nasa.gov

Contracting Officer (CO)

CO: Darla J. Clifton

Mail Stop (M/S): Office of Procurement – M/S 126

Phone Number: (757) 864-5717 / Fax Number: (757) 864-7709

E-Mail Address: Darla.J.Clifton@nasa.gov

| | | | | | |
|--|--|--|--|---|--|
| AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT | | 1. CONTRACT ID CODE | | PAGE OF PAGES 1 2 | |
| 2. AMENDMENT/MODIFICATION NO 000005 | | 3. EFFECTIVE DATE See Block 16C | | 4. REQUISITION/PURCHASE REQ. NO. See Block 12 below. | |
| 6. ISSUED BY NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | | CODE LARC | | 5. PROJECT NO. (If applicable) | |
| 8. NAME AND ADDRESS OF CONTRACTOR (No. street, county, State and ZIP Code) SCIENCE APPLICATIONS INTL CORP Attn: ██████████ 10260 CAMPUS POINT DR SAN DIEGO CA 92121-1522 | | 7. ADMINISTERED BY (If other than Item 6) NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | | CODE LARC | |
| CODE | | FACILITY CODE | | 9A. AMENDMENT OF SOLICITATION NO. | |
| | | | | 9B. DATED (SEE ITEM 11) | |
| | | | | 10A. MODIFICATION OF CONTRACT/ORDER NO. NNL05AA01B NNL06AA77T | |
| | | | | 10B. DATED (SEE ITEM 11) 01/21/2006 | |

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers [] is extended. [] is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 16, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

PR: 4200196577 (COMPLETE) Net Increase: \$497,559.00

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

| | |
|-----------|---|
| CHECK ONE | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. |
| | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
| | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: |
| X | D. OTHER (Specify type of modification and authority) FAR 52.243-2, CHANGES -- COST REIMBURSEMENT (ALTERNATIVE V) (APR 1984) |

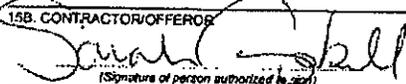
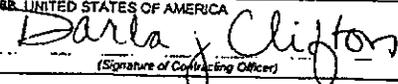
E. IMPORTANT: Contractor [] is not, [X] is required to sign this document and return _____ 1 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to extend the period of performance end date to December 31, 2008 and to provide funding in the amount of \$497,559 to fully fund this task order. Accordingly, the task order terms and conditions are revised as follows:

(Continued on Page 2)

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

| | | | |
|--|-----------------------------|---|-------------------------------|
| 15A. NAME AND TITLE OF SIGNER (Type or print) Sarah J. Campbell, Senior Contracts Manager | | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Darla J. Clifton, Contracting Officer | |
| 15B. CONTRACTOR/OFFEROR  (Signature of person authorized to sign) | 15C. DATE SIGNED 4/10/07 | 16B. UNITED STATES OF AMERICA  (Signature of Contracting Officer) | 16C. DATE SIGNED 4/10/2007 |

NSN 7540-01-152-8070
Previous edition unusable

STANDARD FORM 30 (REV. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

1. The Period of Performance end date (Block 15 of the OF347) and included in Paragraph 8 of the Statement of Work is extended to December 31, 2008.
2. The task order value remains unchanged at \$956,692 (Cost: [REDACTED] and Fee: [REDACTED])
3. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

“CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for NNL06AA77T and covers the following estimated period of performance: January 21, 2006 through December 31, 2008.

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)”

4. All other terms and conditions remain unchanged.

SUMMARY OF TASK ORDER VALUE / FUNDING

| TASK ORDER DOCUMENT | TASK VALUE SUMMARY | | | TASK FUNDING SUMMARY | | |
|---------------------|--------------------|------------|------------|----------------------|------------|------------|
| | ESTIMATED COST | FIXED FEE | TOTAL CPFF | ESTIMATED COST | FIXED FEE | TOTAL CPFF |
| BASIC | [REDACTED] | [REDACTED] | \$727,164 | [REDACTED] | [REDACTED] | \$80,000 |
| MOD 1 | [REDACTED] | [REDACTED] | \$760,884 | [REDACTED] | [REDACTED] | \$113,325 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$309,133 |
| MOD 3 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$359,133 |
| MOD 4 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$459,133 |
| MOD 5 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |

NOTE: Period of Performance for this task order is January 21, 2006 through December 31, 2008.

| | | | |
|---|---------------------------------|--|--|
| AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT | | 1. CONTRACT ID CODE | PAGE OF PAGES 1 3 |
| 2. AMENDMENT/MODIFICATION NO. 000006 | 3. EFFECTIVE DATE 06/25/2007 | 4. REQUISITION/PURCHASE REQ. NO. | 5. PROJECT NO. (if applicable) |
| 8. ISSUED BY NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | CODE LARC | 7. ADMINISTERED BY (if other than item 6) NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | CODE LARC |
| 8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SCIENCE APPLICATIONS INTL CORP Attn: XXXXXXXXXX 10260 CAMPUS POINT DR SAN DIEGO CA 92121-1522 | | (x) 9A. AMENDMENT OF SOLICITATION NO. | 9B. DATED (SEE ITEM 11) |
| CODE | FACILITY CODE | x 10A. MODIFICATION OF CONTRACT/ORDER NO. NNL05AA01B NNL06AA77T | 10B. DATED (SEE ITEM 11) 01/21/2006 |

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended. is not extended.
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required)
See Schedule

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

| | |
|----------------|---|
| CHECK ONE X | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. FAR Clause 52.243-2 Changes--Cost Reimbursement |
| | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
| | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: |
| | D. OTHER (Specify type of modification and authority) |

E. IMPORTANT: Contractor is not. is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCE section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to add a subtask titled "Aerosciences Technical Discipline Team" and associated deliverables as described in the summary of changes.

All other terms and conditions remain unchanged.

Continued.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

| | |
|--|--|
| 15A. NAME AND TITLE OF SIGNER (Type or print) | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) David H. Jones |
| 15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign) | 15C. DATE SIGNED |
| 16B. UNITED STATES OF AMERICA <i>David H. Jones</i> (Signature of Contracting Officer) | 16C. DATE SIGNED 06/25/2007 |

Summary of Changes

1. The sub-task "Aerosciences Technical Discipline Team" and associated deliverables as described on page 3 of this modification and as described in the Contractor's revised proposal dated 15 June 2007 are incorporated into the statement of work.
2. The task order value remains unchanged at \$956,692 (Cost: [REDACTED] and Fee: [REDACTED])
3. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

"CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for NNL06AA77T and covers the following estimated period of performance: January 21, 2006 through December 31, 2008.

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)"

4. All other terms and conditions remain unchanged.

SUMMARY OF TASK ORDER VALUE / FUNDING

| TASK ORDER DOCUMENT | TASK VALUE SUMMARY | | | TASK FUNDING SUMMARY | | |
|---------------------|--------------------|------------|------------|----------------------|------------|------------|
| | ESTIMATED COST | FIXED FEE | TOTAL CPFF | ESTIMATED COST | FIXED FEE | TOTAL CPFF |
| BASIC | [REDACTED] | [REDACTED] | \$727,164 | [REDACTED] | [REDACTED] | \$80,000 |
| MOD 1 | [REDACTED] | [REDACTED] | \$760,884 | [REDACTED] | [REDACTED] | \$113,325 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$309,133 |
| MOD 3 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$359,133 |
| MOD 4 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$459,133 |
| MOD 5 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 6 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |

NOTE: Period of Performance for this task order is January 21, 2006 through December 31, 2008.

3. Purpose, Objective and Background:

3.7 The NESC is an organization created to coordinate and conduct robust, independent engineering and safety assessments across the Agency. To do so, the NESC has created Technical Discipline Teams (TDTs), which will pool senior engineering resources to discover, assess and resolve specific discipline concerns. The scope of this effort is to participate as a member of the NESC's Aerosciences Technical Discipline Team (TDT). As a member of this team of aerosciences discipline experts, the selected individual will participate in team meetings, provide expert advice and guidance to the team leader, and prepare appropriate sections of team reports and findings. The schedule of meetings is to be developed in coordination with the team leader and the rest of the team, and will be conducted mostly through teleconferencing. Travel for face-to-face meetings at domestic locations is expected. The selected individual should also be prepared to participate in multi-discipline NESC Independent Technical Assessment or Investigation teams, or in Consultation or Support activities, as assigned by the TDT lead.

4. Description of the Work to be Performed:**4.7 Aerosciences Technical Discipline Team**

4.7.1 The contractor shall participate as a member of the NESC's Aerosciences Technical Discipline Team providing expertise and consultation support to the Team and, as assigned through that team, to NESC Assessments, Investigations, and to requesting NASA programs. As a participant on this TDT, the contractor shall Participate in team teleconferences and team meetings as required, make and/or express expert opinion on aerospace problems and topics of interest, submit draft sections of team reports and other written products, submit findings/comments to the Aerosciences TDT and the NESC.

5. Deliverables:**5.7 Aerosciences Technical Discipline Team**

5.7.1 The contractor shall provide written reports of findings and recommendations, or segments of overall team reports, as required by the TDT lead to satisfy requirements placed on the team by the NESC and NASA stakeholders.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE

PAGE OF PAGES

2. AMENDMENT/MODIFICATION NO.

3. EFFECTIVE DATE

4. REQUISITION/PURCHASE REQ. NO.

5. PROJECT NO. (if applicable)

000007

08/28/2007

4200217084

6. ISSUED BY

CODE

LARC

7. ADMINISTERED BY (if other than item 6)

CODE

LARC

NASA/Langley Research Center
9B Langley Blvd., Bldg. 1195B
M/S 126
Hampton VA 23681-2199

NASA/Langley Research Center
9B Langley Blvd., Bldg. 1195B
M/S 126
Hampton VA 23681-2199

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

SCIENCE APPLICATIONS INTL CORP
Attn: XXXXXXXXXX
10260 CAMPUS POINT DR
SAN DIEGO CA 92121-1522

9A. AMENDMENT OF SOLICITATION NO.

9B. DATED (SEE ITEM 11)

10A. MODIFICATION OF CONTRACT/ORDER NO.

NNL05AA01B

NNL06AA77T

10B. DATED (SEE ITEM 11)

01/21/2006

CODE

FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended. is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required)

PR 4200217084

Net Increase:

\$400,000.00

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

| | |
|------------------|--|
| CHECK ONE | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. |
| X | FAR Clause 52.243-2 Changes--Cost Reimbursement |
| | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
| | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: |
| | D. OTHER (Specify type of modification and authority) |

E. IMPORTANT: Contractor is not. is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to add additional sub-tasks, more labor hours and \$400,000.00 funding in accordance with the summary of changes.

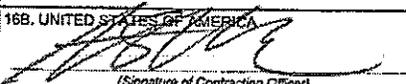
All other terms and conditions remain unchanged.

003 Additional Sub-tasks

887,302.16

Incrementally Funded Amount: \$400,000.00

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

| | | | |
|---|------------------|--|------------------|
| 15A. NAME AND TITLE OF SIGNER (Type or print) | | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) | |
| | | Anthony Kram | |
| 15B. CONTRACTOR/OFFEROR | 15C. DATE SIGNED | 16B. UNITED STATES OF AMERICA | 16C. DATE SIGNED |
| (Signature of person authorized to sign) | |  | 08/28/2007 |
| | | (Signature of Contracting Officer) | |

NSN 7540-01-152-8070
Previous edition unusable

STANDARD FORM 30 (REV. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

Summary of Changes

1. Additional sub-task hours are added to this effort in accordance with the request dated 17 Aug 2007 and the Contractor's revised proposal dated 24 Aug 2007.
2. The task order value is increased by \$887,302 (Cost: [REDACTED] and Fee: [REDACTED] to \$1,843,995 (Cost: [REDACTED] and Fee: [REDACTED]).
3. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

"CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for this task and covers the following estimated period of performance: January 21, 2006 through 31 January 2008.

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)"

4. All other terms and conditions remain unchanged.

SUMMARY OF TASK ORDER VALUE / FUNDING

| TASK ORDER DOCUMENT | TASK VALUE SUMMARY | | | TASK FUNDING SUMMARY | | |
|---------------------|--------------------|------------|-------------|----------------------|------------|-------------|
| | ESTIMATED COST | FIXED FEE | TOTAL CPFF | ESTIMATED COST | FIXED FEE | TOTAL CPFF |
| BASIC | [REDACTED] | [REDACTED] | \$727,164 | [REDACTED] | [REDACTED] | \$80,000 |
| MOD 1 | [REDACTED] | [REDACTED] | \$760,884 | [REDACTED] | [REDACTED] | \$113,325 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$309,133 |
| MOD 3 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$359,133 |
| MOD 4 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$459,133 |
| MOD 5 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 6 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 7 | [REDACTED] | [REDACTED] | \$1,843,995 | [REDACTED] | [REDACTED] | \$1,356,692 |

NOTE: Period of Performance for this task order is January 21, 2006 through December 31, 2008.

| | | | |
|---|---------------------------------|--|--------------------------------|
| AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT | | 1. CONTRACT ID CODE | PAGE OF PAGES 1 7 |
| 2. AMENDMENT/MODIFICATION NO. 000008 | 3. EFFECTIVE DATE 09/28/2007 | 4. REQUISITION/PURCHASE REQ. NO. 4200223645 | 5. PROJECT NO. (if applicable) |
| 6. ISSUED BY NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | CODE LARC | 7. ADMINISTERED BY (if other than item 6) NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | CODE LARC |
| 8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SCIENCE APPLICATIONS INTL CORP Attn: XXXXXXXXXX 10260 CAMPUS POINT DR SAN DIEGO CA 92121-1522 | | (x) 9A. AMENDMENT OF SOLICITATION NO. | |
| CODE | | FACILITY CODE | |
| | | x 10A. MODIFICATION OF CONTRACT/ORDER NO. NNL05AA01E NNL06AA77T | |
| | | 10B. DATED (SEE ITEM 11) 01/21/2006 | |

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers is extended. is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required)
PR 4200223645 Net Increase: \$12,258.00

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

| | |
|-----------|---|
| CHECK ONE | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. |
| | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
| | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: |
| X | D. OTHER (Specify type of modification and authority) FAR 52.232-22 LIMITATION OF FUNDS (AUG 1987) |

E. IMPORTANT: Contractor is not is required to sign this document and return _____ copies to the issuing office.

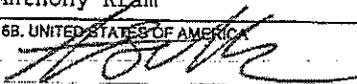
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to add an additional sub-task and add additional funding in accordance with the summary of changes.

All other terms and conditions remain unchanged.

Continued

Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

| | |
|---|---|
| 15A. NAME AND TITLE OF SIGNER (Type or print) | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Anthony Kram |
| 15B. CONTRACTOR/OFFEROR | 15C. DATE SIGNED |
| (Signature of person authorized to sign) | 16B. UNITED STATES OF AMERICA  (Signature of Contracting Officer) |
| | 16C. DATE SIGNED 09/28/2007 |

Summary of Changes

1. Additional sub-tasks added in accordance with the attached revised statement of work.
2. The task order value is increased by \$12,258 (Cost: [REDACTED] and Fee: [REDACTED]) to \$1,856,253 (Cost: [REDACTED] and Fee: [REDACTED]).
3. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

"CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for this task and covers the following estimated period of performance: January 21, 2006 through 31 December 2007.

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)"

4. All other terms and conditions remain unchanged.

SUMMARY OF TASK ORDER VALUE / FUNDING

| TASK ORDER DOCUMENT | TASK VALUE SUMMARY | | | TASK FUNDING SUMMARY | | |
|---------------------|--------------------|------------|-------------|----------------------|------------|-------------|
| | ESTIMATED COST | FIXED FEE | TOTAL CPFF | ESTIMATED COST | FIXED FEE | TOTAL CPFF |
| BASIC | [REDACTED] | [REDACTED] | \$727,164 | [REDACTED] | [REDACTED] | \$80,000 |
| MOD 1 | [REDACTED] | [REDACTED] | \$760,884 | [REDACTED] | [REDACTED] | \$113,325 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$309,133 |
| MOD 3 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$359,133 |
| MOD 4 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$459,133 |
| MOD 5 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 6 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 7 | [REDACTED] | [REDACTED] | \$1,843,995 | [REDACTED] | [REDACTED] | \$1,356,692 |
| MOD 8 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,368,950 |

NOTE: Period of Performance for this task order is January 21, 2006 through 31 January 2008.

December

Block 1: Task Order Objective

The purpose of this Task Order is to provide the NASA Engineering and Safety Center (NESC) with expert consultation and lessons learned by subject matter experts with specific relevant experience ~~from the Apollo era~~ that may provide valuable guidance for the NESC's efforts to assess issues related to NASA's highly visible programs and projects, including the Space Shuttle, the International Space Station (ISS), the Constellation program, which includes the Crew Exploration Vehicle (CEV) and Crew Launch Vehicle (CLV) projects. Other NESC assessments may also require support including science missions and aeronautics research. ~~NESC is conducting several activities supporting the CEV and CLV projects, and has determined that expert consultants are required in each of these.~~

Block 2: Technical Approach

██████████ will be the SAIC Task Leader for this effort; he will coordinate all required support and will oversee task resources. Our study plan and the resulting resource estimate is based on certain key assumptions:

- SAIC will provide ██████████ subject matter experts to participate in all aspects of the technical work contemplated by this task request.
- The ██████████ experts will provide inputs and guidance to NESC teams, will provide input to reports and briefings, and will review and comment on draft deliverables, but will *not* have primary responsibility for any team deliverables.
- On-going consulting to NESC support of the CEV project will be at the level of effort shown in the Subtask 2 hours estimate, averaging ██████████ labor hours each calendar month.
- Key program reviews (see Subtask 2 below) will be held at NASA/JSC.
- All travel is estimated using SAIC's travel department to obtain favorable airfares via corporate agreement, and 2006 government-approved per diem rates for lodging, meals, and incidentals.
- SAIC will provide ██████████ subject matter expertise to participate in all aspects of the technical work associated with the CLV Project.
- NASA will deliver details of the CLV reference trajectory for the LAS modeling work.
- SAIC will provide subject matter expertise to the NESC in support of approved assessments of NASA projects associated with the Space Shuttle program, the International Space Station, space, earth and life science missions and aerospace research.

Any change to these assumptions may result in a change to the cost of this SAIC task.

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findings and recommendations, to be reported to the team leadership by April 30, 2006.

Subtask 2: NESC Support to CEV Activities. SAIC will provide the identified subject matter experts to participate in on-going CEV design and management activities, as directed by the NASA Task Manager. These activities include:

- attend key program reviews such as Systems Requirements Reviews, Preliminary Design Reviews, or Critical Design Reviews
- participate in telecons as required to discuss issues and to evaluate and recommend alternate courses of action
- provide independent assessment of CEV approaches, plans and technical products
- provide recommendations for additional efforts where required
- conduct value added analysis and/or test as required to support and assess the CEV Project
- provide lessons learned based on previous experience from Apollo era and other space programs
- participate in brainstorming sessions to identify possible design improvements to mitigate risks, necessary trade studies and critical subsystems that warrant additional design detail

Because the exact assignments have not yet been specified, SAIC's estimate of the labor and resources required to perform this work is based on certain assumptions about what this subtask will likely require. We assume that the key reviews will be held at or near JSC, and that the on-going support activity will require, on average, ██████████ labor hours per calendar month after completion of the CEV Smart Buyer Study, with only limited attention devoted to this effort during the Smart Buyer Study.

Subtask 3: Critical CEV Systems Reliability Assessment. SAIC will support the Reliability of Critical Spacecraft Systems assessment in several ways, as directed by the NASA Task Manager. These include:

- Historical Systems Performance Review – support and conduct the research and assessment of historical NASA and other applicable systems
- Lessons-Learned – support the acquisition and review of lessons-learned from heritage NASA programs, review data from the Agency lessons-learned database, and solicit/review/analyze systems level lessons-learned.
- External Benchmarking – support and conduct external benchmarking activities including the assessment of requirements generation and application, conduct of trade studies, design and test standards, performance history, and lessons learned
- Develop Requirements and Standards Reference – support the development of an initial Requirements and Standards Reference for NASA

SAIC will synthesize and document all findings and recommendations of the assessments described above. We will perform any required analysis, and will document the results for incorporation into final project documentation. As required, SAIC will develop briefings, graphics, and other documents for this subtask. SAIC will also support meetings including the conduct of briefings, as required. Meeting logistics support will be provided if required.

Subtask 4: Task Management & Reporting. The SAIC Task Leader will organize the task

resources and track progress throughout the period of performance. The Task Leader will prepare input to the Monthly Technical Report and will review Financial Management Reports. He will also ensure that reporting requirements of each subtask activity are met per this plan, and will prepare and deliver the final task order completion documents (final memo summary report and completion approval form) upon completion of the period of performance.

Subtask 5: NESC Support to CLV Activities. SAIC will provide [REDACTED] to participate in on-going CLV design and management activities, as directed by the NASA Task Manager. These activities include:

- Participate in a critical review of the CLV preliminary design to determine acceptability to proceed to a detailed design cycle. Identify areas of concern that may require modification, redesign, special analysis, additional data, or iteration with the preliminary design for resolution.
- Participate in required team telecons and face to face meetings and contribute to preparation of final team report and briefing charts.
- Support travel as required to perform data acquisition, analysis, documentation, and meeting and briefing support.
- Interface with NESC CLV Insight and the CLV Project Upper (second) Stage manufacturing teams to perform critical review and planning of the CLV preliminary design for development manufacturing concepts at the Marshall Space Flight Center.
- Task to include review of first to second stage interface, second stage structure, and second stage to CEV interface and identify areas of concern that may require modification, redesign, special analysis, additional data, or return to preliminary design for resolution. Attend System Requirements Reviews and other review meetings to perform this interface and assessment activity. Contribute to the preparation of the CLV Insight team's final report.

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Subtask 7: Launch Abort System Support. SAIC will participate as a member of the CEV Smart Buyer Design Process Launch Abort System (LAS) Subteam to provide high fidelity modeling of the CEV LAS system in a two-part study. The model will include the event of a detonation in the second stage intertank region, to determine effects on the CM. SAIC will prepare and submit a written report of the findings and recommendations from the two-part study, described below.

In the first part of the study, for a Crew Launch Vehicle (CLV) configured with a 5-segment solid first stage and with a J-2 second stage, SAIC will perform modeling to predict overpressures on the CM of the Crew Exploration Vehicle (CEV) for a range of conditions. The CM will have a 16.5 foot base diameter, and will be based on a configuration selected by the CEV smart buyer team. The model will have geometrically correct simulation of the CLV and CEV. The model will be highly time dependent to capture blast wave propagation, and will use the reference trajectory, to be provided by NASA, for the 5-segment CLV with a J-2 second stage. The model

will predict overpressures on the CM for specified failure modes of the first or second stage of the CLV resulting in detonations at the location of the second stage intertank region. The objective is to specify realistic detonation energy content (TNT equivalent) at this location, and vary the detonation strength parametrically. This shall be done for specified points in the reference trajectory including, at a minimum, on pad, maximum dynamic pressure, and second stage ignition. For each case, the pressures on the CM shall be computed. This shall be done for the case of the CM remaining attached to the vehicle in order to understand where in parameter space the need to abort exists. Results of the study shall be available in time to help determine the performance requirements of the launch abort system in the configuration (or 2 configurations) representing the final design solution(s) for the CEV smart buyers study.

For the second part, SAIC will initiate the abort at specified time delays after a detonation. These time delays shall represent total time required for sensing the condition, reporting, deciding, and igniting the abort motors. The trajectory of the CM will be modeled using realistic geometry, aerodynamic, thrust, and mass properties. The interaction of the blast wave with the ejected CM/LAS system will be computed in order to better understand the survivability of a CM given the specified blast conditions and CM/LAS trajectory away from the vehicle. These computations would be extensions of the set of cases described in the first study, and the need to do these calculations will depend on results from the first study.

Subtask 8: CLV Fuel Trade Study. SAIC will participate as a member of the independent assessment team that will assess the technical, reliability, operational, cost and schedule impacts of a decision to move away from hydrazine for the CLV first stage Thrust Vector Control. SAIC will synthesize and document findings and recommendations of the assessments described above as requested. We will perform any required analysis, and will document the results for incorporation into final project documentation. As required, SAIC will develop briefings, graphics, and other documents for this subtask. SAIC will also support meetings and briefings, as required.

Subtask 9: Support NESC's Aerosciences Technical Discipline Team (TDT). SAIC will provide subject matter experts to participate as members of the TDT team as directed by the NASA Task Monitor. Participation of the subject matter experts include activities such as:

- Participate in TDT team meetings and NESC Independent Technical Assessment/Investigation Teams via teleconference and in person as required
- Provide expert advice / opinions on aerospace problems and other topics of interest for a variety of NASA programs
- Provide guidance to the team leader as requested
- Prepare team reports, develop findings and produce other documentation as needed
- Submit findings/comments to the TDT and the NESC

Subtask 10: Support NESC's Independent Assessments of Space Station and Space Shuttle program issues. SAIC will provide subject matter experts to participate as members of approved Independent Assessment teams as directed by the NASA Task Monitor. Participation of the subject matter experts include activities such as:

- Participate in NESC Independent Technical Assessment/Investigation Teams via teleconference and in-person meetings as required
- Provide expert advice / opinions on topics of interest for a variety of NASA programs
- Provide guidance to team leaders, as requested
- Prepare team reports, develop findings and produce other documentation as needed
- Submit findings/comments to the appropriate team leads and the NESC

Block 3: Schedule and Deliverables

| Milestone | Dates | Deliverables |
|--|------------|---|
| Task Start | [REDACTED] | |
| CEV Smart Buyer Design Process | [REDACTED] | Design team participation via meetings and teleconferences, with report inputs as directed LS-DYNA Modeling Report LAS Report |
| NESC Support to CEV Activities | [REDACTED] | Meeting and teleconference participation Written reports of findings and recommendations |
| NESC Support to CEV Activities | [REDACTED] | Input to final report and accompanying briefing packages |
| Critical Spacecraft Systems Reliability Assessment | [REDACTED] | Meeting and teleconference participation Input to final report and accompanying briefing packages |
| CLV Insight Final Report | [REDACTED] | Contributions to Insight team's report |
| Crew LV TVC Final Report | [REDACTED] | Crew LV TVC Propellant Options Assessment Team Final Report |
| CLV Technical Interchange Meeting | [REDACTED] | Meeting Support |
| NESC Support to CLV Activities | [REDACTED] | Input to final report and briefing package |
| CEV Landing System Final Report | [REDACTED] | CEV Integrated Landing System Evaluation Final Report |
| Aerosciences TDT Support | [REDACTED] | Written findings and recommendations, reports |
| Assessment of Shuttle and Station | [REDACTED] | Participate in meetings, provide expertise and assist in preparation of documentation |
| Monthly Technical Report | [REDACTED] | Input to the regular MTR for the entire contract, issued every four weeks |
| Completion Date | [REDACTED] | Task Order completion memo and approval form |

2. AMENDMENT/MODIFICATION NO. 000009
 3. EFFECTIVE DATE See Block 16C
 4. REQUISITION/PURCHASE REQ. NO. N/A
 5. PROJECT NO. (If applicable)

6. ISSUED BY CODE LARC
 NASA/Langley Research Center
 9B Langley Blvd., Bldg. 1195B
 M/S 126
 Hampton VA 23681-2199
 7. ADMINISTERED BY (If other than Item 6) CODE LARC
 NASA/Langley Research Center
 9B Langley Blvd., Bldg. 1195B
 M/S 126
 Hampton VA 23681-2199

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)
 SCIENCE APPLICATIONS INTL CORP
 Attn: [REDACTED]
 10260 CAMPUS POINT DR
 SAN DIEGO CA 92121-1522

9A. AMENDMENT OF SOLICITATION NO.
 9B. DATED (SEE ITEM 11)
 10A. MODIFICATION OF CONTRACT/ORDER NO.
 NNLO5AA01B
 NNLO6AA77T
 10B. DATED (SEE ITEM 11)
 01/21/2006

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS
 The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended, is not extended.
 Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
 N/A

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

| | |
|----------------|---|
| CHECK ONE X | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. FAR 52.243-2 Changes---Cost Reimbursement (AUG 1987) |
| | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
| | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: |
| | D. OTHER (Specify type of modification and authority) |

E. IMPORTANT: Contractor is not. is required to sign this document and return _____ 0 _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of his modification is to revise the statement of work in accordance with the summary of changes.
 All other terms and conditions remain unchanged.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)
 15B. CONTRACTOR/OFFEROR
 15C. DATE SIGNED
 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)
 Anthony Kram
 16B. UNITED STATES OF AMERICA
 16C. DATE SIGNED
 11/30/2007

Summary of Changes

1. The statement of work is revised as incorporated.
2. There is no change in cost due to this revision.
3. The period of performance end date is administratively changed from 31 January 2008 to 31 December 2008. This was a typographical error on modification 08.
4. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

"CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for this task and covers the following estimated period of performance: January 21, 2006 through 31 December 2007.

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)"

5. All other terms and conditions remain unchanged.

SUMMARY OF TASK ORDER VALUE / FUNDING

| TASK ORDER DOCUMENT | TASK VALUE SUMMARY | | | TASK FUNDING SUMMARY | | |
|---------------------|--------------------|------------|-------------|----------------------|------------|-------------|
| | ESTIMATED COST | FIXED FEE | TOTAL CPFF | ESTIMATED COST | FIXED FEE | TOTAL CPFF |
| BASIC | [REDACTED] | [REDACTED] | \$727,164 | [REDACTED] | [REDACTED] | \$80,000 |
| MOD 1 | [REDACTED] | [REDACTED] | \$760,884 | [REDACTED] | [REDACTED] | \$113,325 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$309,133 |
| MOD 3 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$359,133 |
| MOD 4 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$459,133 |
| MOD 5 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 6 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 7 | [REDACTED] | [REDACTED] | \$1,843,995 | [REDACTED] | [REDACTED] | \$1,356,692 |
| MOD 8 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,368,950 |
| MOD 9 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,368,950 |

NOTE: Period of Performance for this task order is January 21, 2006 through 31 December 2008.

Block 1: Task Order Objective

The purpose of this Task Order is to provide the NASA Engineering and Safety Center (NESC) with expert consultation and lessons learned by subject matter experts with specific relevant experience that may provide valuable guidance for the NESC's efforts to assess issues related to NASA's highly visible programs and projects, including the Space Shuttle, the International Space Station (ISS), the Constellation program, which includes the Crew Exploration Vehicle (CEV) and Crew Launch Vehicle (CLV) projects. Other NESC assessments may also require support including science missions and aeronautics research. The Task Order will also provide discipline specific expertise to the NESC's Technical Discipline Teams and the associated NASA Technical Fellows, with the objective of advancing NASA technical capabilities.

Block 2: Technical Approach

██████████ will be the SAIC Task Leader for this effort; he will coordinate all required support and will oversee task resources. Our study plan and the resulting resource estimate is based on certain key assumptions:

- SAIC will provide subject matter experts to participate in all aspects of the technical work contemplated by this task request.
- The experts will provide inputs and guidance to NESC teams, will provide input to reports and briefings, and will review and comment on draft deliverables, but will not have primary responsibility for any team deliverables.
- On-going consulting to NESC support of the CEV project will be at the level of effort shown in the Subtask 2 hours estimate, averaging two hundred labor hours each calendar month.
- Key program reviews (see Subtask 2 below) will be held at NASA/JSC.
- All travel is estimated using SAIC's travel department to obtain favorable airfares via corporate agreement, and 2006 government-approved per diem rates for lodging, meals, and incidentals.
- SAIC will provide subject matter expertise to participate in all aspects of the technical work associated with the CLV Project.
- NASA will deliver details of the CLV reference trajectory for the LAS modeling work.
- SAIC will provide subject matter expertise to the NESC in support of approved assessments of NASA projects associated with the Space Shuttle program, the International Space Station, space, earth and life science missions and aerospace research.

Any change to these assumptions may result in a change to the cost of this SAIC task.

Subtask 1: CEV Smart Buyer Design Process. SAIC will provide ██████████ subject matter experts to participate as members of the NESC Smart Buyer Design process. These individuals are ██████████. These subject matter experts will travel to and participate in the NESC Smart Buyer Design Meeting, to be held at NASA/LaRC January 23-28. Each individual will participate in planned sessions to identify: (1) possible improvements to the baseline design, (2) trade studies required, and; (3) any critical subsystems that may require further in-depth attention. After the meeting, each individual will continue to participate as directed in the on-going evaluation and prioritization of the independent design work that NESC will perform. This subtask concludes with wrap-up of

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- Participate in required team telecons and face to face meetings and contribute to preparation of final team report and briefing charts.
- Support travel as required to perform data acquisition, analysis, documentation, and meeting and briefing support.
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will predict overpressures on the CM for specified failure modes of the first or second stage of the CLV resulting in detonations at the location of the second stage intertank region. The objective is to specify realistic detonation energy content (TNT equivalent) at this location, and vary the detonation strength parametrically. This shall be done for specified points in the reference trajectory including, at a minimum, on pad, maximum dynamic pressure, and second stage ignition. For each case, the pressures on the CM shall be computed. This shall be done for the case of the CM remaining attached to the vehicle in order to understand where in parameter space the need to abort exists. Results of the study shall be available in time to help determine the performance requirements of the launch abort system in the configuration (or 2 configurations) representing the final design solution(s) for the CEV smart buyers study.

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- Participate in TDT team meetings and NESC Independent Technical Assessment/Investigation Teams via teleconference and in person as required
- Provide expert advice / opinions on ~~aeronautics~~ discipline related problems and other topics of interest for a variety of NASA programs
- ~~Participate as needed in other TDT activities, such as discipline related presentations to outside interests and NESC Academy courses~~
- Provide guidance to the team leader as requested
- Prepare team reports, develop findings and produce other documentation as needed
- Submit findings/comments to the TDT and the NESC

Subtask 10: Support NESC's Independent Assessments of Space Station and Space Shuttle program issues. SAIC will provide subject matter experts to participate as members of approved Independent Assessment teams as directed by the NASA Task Monitor. Participation of the subject matter experts include activities such as:

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- Provide expert advice / opinions on topics of interest for a variety of NASA programs

- Provide guidance to team leaders, as requested
 - Prepare team reports, develop findings and produce other documentation as needed
- Submit findings/comments to the appropriate team leads and the NESC

Block 3: Schedule and Deliverables

| Milestone | Dates | Deliverables |
|--|------------|---|
| Task Start | [REDACTED] | |
| CEV Smart Buyer Design Process | [REDACTED] | Design team participation via meetings and teleconferences, with report inputs as directed LS-DYNA Modeling Report LAS Report |
| NESC Support to CEV Activities | [REDACTED] | Meeting and teleconference participation Written reports of findings and recommendations |
| NESC Support to CEV Activities | | Input to final report and accompanying briefing packages |
| Critical Spacecraft Systems Reliability Assessment | [REDACTED] | Meeting and teleconference participation Input to final report and accompanying briefing packages |
| CLV Insight Final Report | [REDACTED] | Contributions to Insight team's report |
| Crew LV TVC Final Report | [REDACTED] | Crew LV TVC Propellant Options Assessment Team Final Report |
| CLV Technical Interchange Meeting | [REDACTED] | Meeting Support |
| NESC Support to CLV Activities | [REDACTED] | Input to final report and briefing package |
| CEV Landing System Final Report | [REDACTED] | CEV Integrated Landing System Evaluation Final Report |
| Aerosciences TDT Support | [REDACTED] | Written findings and recommendations, reports |
| Monthly Technical Report | [REDACTED] | Input to the regular MTR for the entire contract, issued every four weeks |
| Completion Date | [REDACTED] | Task Order completion memo and approval form |

| | | | | |
|--|-------------------|---|--------------------------------|------|
| AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT | | 1. CONTRACT ID CODE | PAGE OF PAGES | |
| | | | 1 | 2 |
| 2. AMENDMENT/MODIFICATION NO. | 3. EFFECTIVE DATE | 4. REQUISITION/PURCHASE REQ. NO. | 5. PROJECT NO. (if applicable) | |
| 000010 | See Block 16C | 4200250538 | | |
| 6. ISSUED BY | CODE | 7. ADMINISTERED BY (if other than item 6) | CODE | LARC |
| NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | LARC | NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | | |
| 8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) | | 9A. AMENDMENT OF SOLICITATION NO. | | |
| SCIENCE APPLICATIONS INTL CORP Attn: [REDACTED] 10260 CAMPUS POINT DR SAN DIEGO CA 92121-1522 | | (X) | | |
| CODE: | | 9B. DATED (SEE ITEM 11) | | |
| FACILITY CODE | | X | | |
| | | 10A. MODIFICATION OF CONTRACT/ORDER NO. NNL05AA01B NNL06AA77T | | |
| | | 10B. DATED (SEE ITEM 13) 01/21/2006 | | |

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers is extended, is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required) Net Increase: \$169,000.00
PR 4200250538

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

| | |
|-----------|---|
| CHECK ONE | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. |
| | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
| | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: |
| X | D. OTHER (Specify type of modification and authority) FAR 52.232-22 LIMITATION OF FUNDS (APR 1984) |

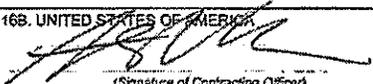
E. IMPORTANT: Contractor is not, is required to sign this document and return _____ 0 _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to add incremental funding in accordance with the summary of changes.

All other terms and conditions remain unchanged.

Except as provided herein, all terms and conditions of the document referenced in item 8A or 10A, as heretofore changed, remains unchanged and in full force and effect.

| | | | |
|---|------------------|--|------------------|
| 15A. NAME AND TITLE OF SIGNER (Type or print) | | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) | |
| | | Anthony Kram | |
| 15B. CONTRACTOR/OFFEROR | 15C. DATE SIGNED | 16B. UNITED STATES OF AMERICA | 16C. DATE SIGNED |
| (Signature of person authorized to sign) | |  | 05/12/2008 |
| | | (Signature of Contracting Officer) | |

Summary of Changes

1. Incremental funding of [REDACTED] is added to this task. The total value of the task is not changed. Funding summary is listed in the chart below.
2. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

"CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for this task and covers the following estimated period of performance: January 21, 2006 through 30 September 2008.

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)"

3. All other terms and conditions remain unchanged.

SUMMARY OF TASK ORDER VALUE / FUNDING

| TASK ORDER DOCUMENT | TASK VALUE SUMMARY | | | TASK FUNDING SUMMARY | | |
|---------------------|--------------------|------------|-------------|----------------------|------------|-------------|
| | ESTIMATED COST | FIXED FEE | TOTAL CPFF | ESTIMATED COST | FIXED FEE | TOTAL CPFF |
| BASIC | [REDACTED] | [REDACTED] | \$727,164 | [REDACTED] | [REDACTED] | \$80,000 |
| MOD 1 | [REDACTED] | [REDACTED] | \$760,884 | [REDACTED] | [REDACTED] | \$113,325 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$309,133 |
| MOD 3 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$359,133 |
| MOD 4 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$459,133 |
| MOD 5 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 6 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 7 | [REDACTED] | [REDACTED] | \$1,843,995 | [REDACTED] | [REDACTED] | \$1,356,692 |
| MOD 8 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,368,950 |
| MOD 9 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,368,950 |
| MOD 10 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,537,950 |

NOTE: Period of Performance for this task order is January 21, 2006 through 31 December 2008.

| | | | |
|---|------------------------------------|--|--|
| AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT | | 1. CONTRACT ID CODE | PAGE OF PAGES |
| 2. AMENDMENT/MODIFICATION NO. 000011 | 3. EFFECTIVE DATE See Block 16C | 4. REQUISITION/PURCHASE REQ. NO. 4200261290 | 1 2 |
| 6. ISSUED BY NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | CODE LARC | 7. ADMINISTERED BY (If other than Item 6) NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | 5. PROJECT NO. (If applicable) CODE LARC |
| 8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SCIENCE APPLICATIONS INTL CORP Attn: XXXXXXXXXX 10260 CAMPUS POINT DR SAN DIEGO CA 92121-1522 | | (x) 9A. AMENDMENT OF SOLICITATION NO. | |
| CODE | | 9B. DATED (SEE ITEM 11) | |
| FACILITY CODE | | x 10A. MODIFICATION OF CONTRACT/ORDER NO. NNL05AA01B NNL06AA77T | |
| | | 10B. DATED (SEE ITEM 13) 01/21/2006 | |

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended. is not extended.
 Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
 PR 4200261290 Net Increase: \$100,000.00

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

| | |
|-----------|---|
| CHECK ONE | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. |
| | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
| | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: |
| X | D. OTHER (Specify type of modification and authority) FAR 52.232-22 LIMITATION OF FUNDS (APR 1984) |

E. IMPORTANT: Contractor is not is required to sign this document and return _____ 0 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to add incremental funding in accordance with the summary of changes.

All other terms and conditions remain unchanged.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

| | |
|---|---|
| 15A. NAME AND TITLE OF SIGNER (Type or print) Robin Amburn Grob, Contracts Manager | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Anthony Kram |
| 15B. CONTRACTOR/OFFEROR <i>Robin Amburn Grob</i> (Signature of person authorized to sign) | 16B. UNITED STATES OF AMERICA <i>[Signature]</i> (Signature of Contracting Officer) |
| 15C. DATE SIGNED 7/16/08 | 16C. DATE SIGNED 07/16/2008 |

Summary of Changes

1. Incremental funding of [REDACTED] is added to this task. The total value of the task is not changed. Funding summary is listed in the chart below.
2. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

“CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for this task and covers the following estimated period of performance: January 21, 2006 through 31 August 2008.

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)”

3. All other terms and conditions remain unchanged.

SUMMARY OF TASK ORDER VALUE / FUNDING

| TASK ORDER DOCUMENT | TASK VALUE SUMMARY | | | TASK FUNDING SUMMARY | | |
|---------------------|--------------------|------------|-------------|----------------------|------------|-------------|
| | ESTIMATED COST | FIXED FEE | TOTAL CPFF | ESTIMATED COST | FIXED FEE | TOTAL CPFF |
| BASIC | [REDACTED] | [REDACTED] | \$727,164 | [REDACTED] | [REDACTED] | \$80,000 |
| MOD 1 | [REDACTED] | [REDACTED] | \$760,884 | [REDACTED] | [REDACTED] | \$113,325 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$309,133 |
| MOD 3 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$359,133 |
| MOD 4 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$459,133 |
| MOD 5 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 6 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 7 | [REDACTED] | [REDACTED] | \$1,843,995 | [REDACTED] | [REDACTED] | \$1,356,692 |
| MOD 8 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,368,950 |
| MOD 9 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,368,950 |
| MOD 10 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,537,950 |
| MOD 11 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,637,950 |

NOTE: Period of Performance for this task order is January 21, 2006 through 31 December 2008.

| | | | |
|---|--|--|--|
| AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT | | 1. CONTRACT ID CODE | PAGE OF PAGES |
| 2. AMENDMENT/MODIFICATION NO. 000012 | | 3. EFFECTIVE DATE See Block 16C | 1 2 |
| 6. ISSUED BY NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | | 4. REQUISITION/PURCHASE REQ. NO. 4200271112 | 5. PROJECT NO. (If applicable) |
| CODE LARC | | 7. ADMINISTERED BY (If other than Item 6) NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | CODE LARC |
| 8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) SCIENCE APPLICATIONS INTL CORP Attn: XXXXXXXXXX 10260 CAMPUS POINT DR SAN DIEGO CA 92121-1522 | | (x) 9A. AMENDMENT OF SOLICITATION NO. | 9B. DATED (SEE ITEM 11) |
| CODE | | X 10A. MODIFICATION OF CONTRACT/ORDER NO. NNL05AA01B NNL06AA77T | 10B. DATED (SEE ITEM 13) 01/21/2006 |
| FACILITY CODE | | 11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS | |

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended. is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
PR 4200271112 Net Increase: \$100,000.00

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

| | |
|-----------|---|
| CHECK ONE | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. |
| | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
| | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: |
| X | D. OTHER (Specify type of modification and authority) FAR 52.232-22 LIMITATION OF FUNDS (APR 1984) |

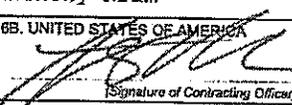
E. IMPORTANT: Contractor is not. is required to sign this document and return _____ 0 _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this task is to add additional funding in the amount of \$100,000 in accordance with the summary of changes.

All other terms and conditions remain unchanged.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

| | | | |
|---|------------------|---|--------------------------------|
| 15A. NAME AND TITLE OF SIGNER (Type or print) | | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Anthony Kram | |
| 15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign) | 15C. DATE SIGNED | 16B. UNITED STATES OF AMERICA  (Signature of Contracting Officer) | 16C. DATE SIGNED 10/08/2008 |

Summary of Changes

1. Incremental funding of [REDACTED] is added to this task. The total value of the task is not changed. Funding summary is listed in the chart below.
2. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

"CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for this task and covers the following estimated period of performance: January 21, 2006 through 30 November 2008.

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.
 (End of Clause)"

3. All other terms and conditions remain unchanged.

SUMMARY OF TASK ORDER VALUE / FUNDING

| TASK ORDER DOCUMENT | TASK VALUE SUMMARY | | | TASK FUNDING SUMMARY | | |
|---------------------|--------------------|------------|-------------|----------------------|------------|-------------|
| | ESTIMATED COST | FIXED FEE | TOTAL CPFF | ESTIMATED COST | FIXED FEE | TOTAL CPFF |
| BASIC | [REDACTED] | [REDACTED] | \$727,164 | [REDACTED] | [REDACTED] | \$80,000 |
| MOD 1 | [REDACTED] | [REDACTED] | \$760,884 | [REDACTED] | [REDACTED] | \$113,325 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$309,133 |
| MOD 3 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$359,133 |
| MOD 4 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$459,133 |
| MOD 5 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 6 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 7 | [REDACTED] | [REDACTED] | \$1,843,995 | [REDACTED] | [REDACTED] | \$1,356,692 |
| MOD 8 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,368,950 |
| MOD 9 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,368,950 |
| MOD 10 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,537,950 |
| MOD 11 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,637,950 |
| MOD 12 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,737,950 |

NOTE: Period of Performance for this task order is January 21, 2006 through 31 December 2008.

| | | | |
|--|------------------------------------|--|--------------------------------|
| AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT | | 1. CONTRACT ID CODE | PAGE OF PAGES 1 2 |
| 2. AMENDMENT/MODIFICATION NO. 000013 | 3. EFFECTIVE DATE See Block 16C | 4. REQUISITION/PURCHASE REQ. NO. 4200271701 | 5. PROJECT NO. (if applicable) |
| 6. ISSUED BY NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | CODE LARC | 7. ADMINISTERED BY (if other than Item 6) NASA/Langley Research Center 9B Langley Blvd., Bldg. 1195B M/S 126 Hampton VA 23681-2199 | CODE LARC |
| 8. NAME AND ADDRESS OF CONTRACTOR (No. street, county, State and ZIP Code) SCIENCE APPLICATIONS INTL CORP Attn: [REDACTED] 10260 CAMPUS POINT DR SAN DIEGO CA 92121-1522 | | 9A. AMENDMENT OF SOLICITATION NO. | |
| CODE | | 9B. DATED (SEE ITEM 11) | |
| FACILITY CODE | | 10A. MODIFICATION OF CONTRACT/ORDER NO. NNL05AA01B NNL06AA77T | |
| | | 10B. DATED (SEE ITEM 13) 01/21/2006 | |

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers is extended. is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required)
FR 4200271701 Net Increase: \$218,303.00

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

| | |
|-----------|---|
| CHECK ONE | A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. |
| | B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b). |
| | C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: |
| X | D. OTHER (Specify type of modification and authority) FAR 52.232-22 LIMITATION OF FUNDS (APR 1984) |

E. IMPORTANT: Contractor is not. is required to sign this document and return 1 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is to:
 1) Revise the statement of work; and
 2) Increase the total value of the order; and
 3) Add additional funding in accordance with the summary of changes.

All other terms and conditions remain unchanged.

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

| | | | |
|---|------------------------------|---|--------------------------------|
| 15A. NAME AND TITLE OF SIGNER (Type or print) Robin Amburn Grob, Contracts Manager | | 16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Anthony Kram | |
| 15B. CONTRACTOR/OFFEROR <i>Robin Amburn Grob</i> (Signature of person authorized to sign) | 15C. DATE SIGNED 10/22/08 | 16B. UNITED STATES OF AMERICA <i>[Signature]</i> (Signature of Contracting Officer) | 16C. DATE SIGNED 10/22/2008 |

NSN 7540-01-152-8070
Previous edition unusable

STANDARD FORM 30 (REV. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

Summary of Changes

1. The statement of work is revised to add approximately [REDACTED] hours to accelerate the Constellation program.
2. As a result of the additional hours, the total value of the order is increased by \$292,511 ([REDACTED] cost: [REDACTED] fee) from \$1,856,253 to \$2,148,764. Value totals are listed in the summary chart below.
3. Incremental funding in the amount of \$218,303 is added to this order. Funding totals are listed in the summary chart below.
4. In accordance with Paragraph B.4, of the Basic Contract (NNL05AA01B), FAR 52.232-22 applies at the Task Order level. In accordance with this clause, NFS 1852.232-81 as previously incorporated in NNL06AA77T is revised to read:

“CONTRACT FUNDING, (NFS 1852.232-81) (JUN 1990)

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this Task Order is [REDACTED]. This allotment is for this task and covers the following estimated period of performance: January 21, 2006 through 30 November 2008.

(b) An additional amount of [REDACTED] is obligated under this Task Order for payment of fee.

(End of Clause)”

5. All other terms and conditions remain unchanged.

SUMMARY OF TASK ORDER VALUE / FUNDING

| TASK ORDER DOCUMENT | TASK VALUE SUMMARY | | | TASK FUNDING SUMMARY | | |
|---------------------|--------------------|------------|-------------|----------------------|------------|-------------|
| | ESTIMATED COST | FIXED FEE | TOTAL CPFF | ESTIMATED COST | FIXED FEE | TOTAL CPFF |
| BASIC | [REDACTED] | [REDACTED] | \$727,164 | [REDACTED] | [REDACTED] | \$80,000 |
| MOD 1 | [REDACTED] | [REDACTED] | \$760,884 | [REDACTED] | [REDACTED] | \$113,325 |
| MOD 2 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$309,133 |
| MOD 3 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$359,133 |
| MOD 4 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$459,133 |
| MOD 5 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 6 | [REDACTED] | [REDACTED] | \$956,692 | [REDACTED] | [REDACTED] | \$956,692 |
| MOD 7 | [REDACTED] | [REDACTED] | \$1,843,995 | [REDACTED] | [REDACTED] | \$1,356,692 |
| MOD 8 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,368,950 |
| MOD 9 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,368,950 |
| MOD 10 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,537,950 |
| MOD 11 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,637,950 |
| MOD 12 | [REDACTED] | [REDACTED] | \$1,856,253 | [REDACTED] | [REDACTED] | \$1,737,950 |
| MOD 13 | [REDACTED] | [REDACTED] | \$2,148,764 | [REDACTED] | [REDACTED] | \$1,956,253 |

NOTE: Period of Performance for this task order is January 21, 2006 through 31 December 2008.