

14. DESCRIPTION OF AMENDMENT/MODIFICATION cont.

1) This Modification is to obligate funds to the contract in the amount of [REDACTED] using multiple Purchase Requests (PRs). The PR numbers and respective amounts are 4200356263 [REDACTED], 4200367959 [REDACTED], 4200356235 [REDACTED], 4200356261 [REDACTED]. Therefore, Section B, paragraph B.7, NFS 1852.232-81 CONTRACT FUNDING (JUN 1990), is deleted entirely and replaced by the following:

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B.3. CONTRACT FUNDING (NFS 1852.232-81) (JUNE 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 contract is \$4,955,334.47. This allotment is for the line items 01A and 01B and covers the following estimated period of performance: date of award through March 31, 2011.

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

SUMMARY OF CONTRACT FUNDING	FROM	BY	TO
Cost	\$4,385,705.26	\$569,629.21	\$4,955,334.47
Fixed Fee	[REDACTED]	[REDACTED]	[REDACTED]
Total Cost Plus Fixed Fee	[REDACTED]	[REDACTED]	[REDACTED]

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(END OF CLAUSE)

2) All other terms and conditions remain the same.

End of Modification No. 07

**STATEMENT OF WORK**  
For  
**SPACE TECHNOLOGY RESEARCH AND DEVELOPMENT**

**1.0 INTRODUCTION**

The principal purpose of this contract is to provide support to the Space Technology Division at NASA Ames Research Center to carry out their varied research programs. This document describes the current and anticipated research programs of the Division. The major objective is the development of technologies for use in the design and fabrication of prototype vehicles that travel at hypervelocities in the atmosphere of Earth and other bodies in the solar system. Other projects include NASA missions in nanotechnology, advanced materials, sensors and devices.

**2.0 SCOPE OF WORK****2.1 GENERAL SCOPE**

The scope of the effort to be performed within the Space Technology Division is described in this section.

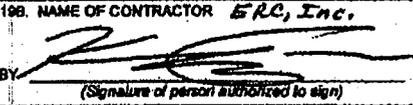
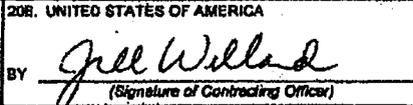
The Contractor shall provide multidisciplinary engineering research and development, pursuant to task assignments issued by the Contracting Officer. These services shall include the personnel, facilities, equipment and materials (unless otherwise provided by the Government) to accomplish the tasks.

Task assignments will be issued to perform services in the following areas: project management, systems engineering, research and analysis, design and development, testing, computer modeling, technical writing, support for third party Quality System, administrative support, computer system administration, organizing and facilitating technical and working meetings and invitational travel for outside researchers, and other functions, which may include fabrication and fabrication support, necessary to complete projects. The Contractor shall provide management and administrative functions necessary to effectively and efficiently manage the work performed under this contract.

The Contractor shall perform services required by task order in the following technical areas:

- a) chemistry and physics of hypersonic, chemically reacting, and radiating flows
- b) aerothermodynamic analysis of entry systems
- c) development, modification, and application of computational fluid dynamics tools
- d) aeronautics and space vehicle trajectory analysis
- e) materials science and engineering of ablative, reusable and multi-functional thermal protection materials
- f) experiment planning, execution, and analysis for high-enthalpy testing of materials and real-gas phenomena
- g) quantum computing and pre-biotic geochemistry mechanisms
- h) educational outreach
- i) internship employment opportunities to support STRAD requirements for NASA programs and to provide students with exposure to public service, enhancement of their educational experience, and financial support to encourage their educational goals



<b>AWARD/CONTRACT</b>		1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 950)		RATING C-9	PAGE OF PAGES 1 182
2. CONTRACT (Proc. Inst. Ident.) NO. NNA10DE12C		3. EFFECTIVE DATE See Block 20C		4. REQUISITION/PURCHASE REQUEST/PROJECT NO. 4200198991/4200333768	
5. ISSUED BY NASA-Ames Research Center Bldg. 241, Mail Stop 241-1 Moffett Field, CA 94035-0001		CODE JA:241-1	6. ADMINISTERED BY (If other than Item 5) Acquisition Division Moffett Field, CA 94035-0001 Attn: Lana Jones Clamon, M/S 241-1, 650-604-5830		CODE JAC
7. NAME AND ADDRESS OF CONTRACTOR (No. street, county, state and ZIP Code) ERC, Inc. 4901 Corporate Drive, Suite E Huntsville, AL 35805				8. DELIVERY <input checked="" type="checkbox"/> FOB ORIGIN <input type="checkbox"/> OTHER (See below)	
				9. DISCOUNT FOR PROMPT PAYMENT Net 30	
				10. SUBMIT INVOICES (4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN: ITEM G.3	
11. SHIP TO/MARK FOR NASA-Ames Research Center ATTN: Michael Olson, Mail Stop 234-1 Bldg. 234, Rm 213 P.O. Box 1 650-604-2085 Moffett Field, CA 94035-0001		CODE TS	12. PAYMENT WILL BE MADE BY NASA Shared Services Center (NSSC) Financial Management Division (FMD)—Accounts Payable Bldg. 1111, Road C Stennis Space Center, MS 39529 Email: NSSC-AccountsPayable@nasa.gov / Fax: 666-209-5415		CODE
13. AUTHORITY FOR USING OTHER FULL AND OPEN COMPETITION: <input checked="" type="checkbox"/> 10 U.S.C. 2304(c)(5) <input type="checkbox"/> 41 U.S.C. 253(c)(1)			14. ACCOUNTING AND APPROPRIATION DATA 4200198991/4200333768 Obligated: [REDACTED] PPC:KX		
15A. ITEM NO.	15B. SUPPLIES/SERVICES	15C. QUANTITY	15D. UNIT	15E. UNIT PRICE	15F. AMOUNT
1	Space Technology Research And Development for the Phase-In Period set forth in Section F., paragraph F.2 (a)	1	JOB	[REDACTED]	[REDACTED]
2	Space Technology Research And Development for the Base Period set forth in Section F., paragraph F.2 (b); including the Contract Data Requirements List set forth in Attachment J.1.(a) 2  SECTION K - REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS are incorporated by reference.	1	JOB	Based on Task Orders	Minimum \$250,000 Maximum \$45,000,000
15G. TOTAL AMOUNT OF CONTRACT					See 15F
16. TABLE OF CONTENTS					
(X) SEC.	DESCRIPTION	PAGE(S)	(X) SEC.	DESCRIPTION	PAGE(S)
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X C	DESCRIPTION/SPECS./WORK STATEMENT	C-1	X J	LIST OF ATTACHMENTS	J1
X D	PACKAGING AND MARKING	D-1	PART IV - REPRESENTATIONS AND INSTRUCTIONS		
X E	INSPECTION AND ACCEPTANCE	E1	K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS	
X F	DELIVERIES OR PERFORMANCE	F1-F2	L	INSTRS., CONDS., AND NOTICES TO OFFERORS	
X G	CONTRACT ADMINISTRATION DATA	G1-G-7	M	EVALUATION FACTORS FOR AWARD	
X H	SPECIAL CONTRACT REQUIREMENTS	H1-H8			
CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE					
17. <input checked="" type="checkbox"/> CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return 1 copy to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)			18. <input type="checkbox"/> AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number NNA07188991R-ACA, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the terms listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.		
19A. NAME AND TITLE OF SIGNER (Type or print) Kenneth C. Frame, President			20A. NAME OF CONTRACTING OFFICER Jill Willard, Contracting Officer		
19B. NAME OF CONTRACTOR <i>ERC, Inc.</i>		19C. DATE SIGNED 30 MAR 2010	20B. UNITED STATES OF AMERICA		20C. DATE SIGNED 4/1/2010
BY  (Signature of person authorized to sign)			BY  (Signature of Contracting Officer)		

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<b>AWARD/CONTRACT</b>		<b>1. THIS CONTRACT IS A RATED ORDER</b> UNDER DPAS (15 CFR 350)		<b>RATING</b> C-9	<b>PAGE OF PAGES</b> 1   182
<b>2. CONTRACT (Proc. Inst. Ident.) NO.</b> NNA10DE12C		<b>3. EFFECTIVE DATE</b>		<b>4. REQUISITION/PURCHASE REQUEST/PROJECT NO.</b> 4200198991/4200333768	
<b>5. ISSUED BY</b> NASA-Ames Research Center Bldg. 241, Mail Stop 241-1 Moffett Field, CA 94035-0001		<b>CODE</b> JA:241-1	<b>6. ADMINISTERED BY (If other than Item 6)</b> Acquisition Division Moffett Field, CA 94035-0001 Attn: Lana Jones Clemon, M/S 241-1, 650-604-5830		<b>CODE</b> JAC
<b>7. NAME AND ADDRESS OF CONTRACTOR (No. street, county, state and ZIP Code)</b> ERC, Inc. 4901 Corporate Drive, Suite E Huntsville, AL 35805				<b>8. DELIVERY</b> <input checked="" type="checkbox"/> FOB ORIGIN <input type="checkbox"/> OTHER (See below)	
				<b>9. DISCOUNT FOR PROMPT PAYMENT</b> Net 30	
				<b>10. SUBMIT INVOICES</b> (4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN: ITEM G.3	
<b>11. SHIP TO/MARK FOR</b> NASA-Ames Research Center ATTN: Michael Olson, Mail Stop 234-1 Bldg. 234, Rm 213 P.O. Box 1 650-604-2095 Moffett Field, CA 94035-0001		<b>CODE</b>	<b>FACILITY CODE</b>	<b>12. PAYMENT WILL BE MADE BY</b> NASA Shared Services Center (NSSC) Financial Management Division (FMD)—Accounts Payable Bldg. 1111, Road C Stennis Space Center, MS 39529 Email: NSSC-AccountsPayable@nasa.gov / Fax: 866-209-5415	
<b>13. AUTHORITY FOR USING OTHER FULL AND OPEN COMPETITION:</b> <input checked="" type="checkbox"/> 10 U.S.C. 2304(c)(5) <input type="checkbox"/> 41 U.S.C. 253(c)( )				<b>14. ACCOUNTING AND APPROPRIATION DATA</b> 4200198991/4200333768 Obligated: [REDACTED] PPC:KX	
<b>15A. ITEM NO.</b>	<b>15B. SUPPLIES/SERVICES</b>	<b>15C. QUANTITY</b>	<b>15D. UNIT</b>	<b>15E. UNIT PRICE</b>	<b>15F. AMOUNT</b>
1	Space Technology Research And Development for the Phase-In Period set forth in Section F., paragraph F.2 (a)	1	JOB	[REDACTED]	[REDACTED]
2	Space Technology Research And Development for the Base Period set forth in Section F., paragraph F.2 (b); including the Contract Data Requirements List set forth in Attachment J.1.(a) 2  SECTION K - REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS are incorporated by reference.	1	JOB	Based on Task Orders	Minimum \$250,000 Maximum \$45,000,000
<b>15G. TOTAL AMOUNT OF CONTRACT</b>					See 15F
<b>16. TABLE OF CONTENTS</b>					
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X H	SPECIAL CONTRACT REQUIREMENTS	H1-H9			
<b>CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE</b>					
<b>17. <input checked="" type="checkbox"/> CONTRACTOR'S NEGOTIATED AGREEMENT</b> (Contractor is required to sign this document and return 1 copy to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein. (Attachments are listed herein.)			<b>18. <input type="checkbox"/> AWARD</b> (Contractor is not required to sign this document.) Your offer on Solicitation Number NNA07198991R-ACA, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the terms listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.		
<b>19A. NAME AND TITLE OF SIGNER (Type or print)</b> Kenneth C. Frame, President			<b>20A. NAME OF CONTRACTING OFFICER</b> Jill Willard, Contracting Officer		
<b>19B. NAME OF CONTRACTOR</b>		<b>19C. DATE SIGNED</b>	<b>20B. UNITED STATES OF AMERICA</b>		<b>20C. DATE SIGNED</b>
BY _____ (Signature of person authorized to sign)			BY _____ (Signature of Contracting Officer)		

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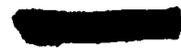
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SECTION B – SUPPLIES OR SERVICES AND PRICES/COSTS

**B.1 SUPPLIES/SERVICES TO BE PROVIDED**

(a) This is an Indefinite Delivery Indefinite Quantity (IDIQ), Cost Plus Fixed Fee (CPFF) contract. The contractor shall provide all resources (except as may be expressly stated in this contract as furnished by the Government) necessary to furnish the items below in accordance with the Description/Specification/Work Statement set forth in Section C and as identified under individual task orders.

1. Item No.	2. Description	3. Qty	4. Unit	5. Amount
*01	Space Technology Research And Development for the Phase-In Period set forth in Section F., paragraph F.2 (a), in accordance with the Phase-In Plan.	1	Job	
02	Space Technology Research And Development for the Base Period set forth in Section F., paragraph F.2 (b); including the Contract Data Requirements List set forth in Attachment J.1.(a) 2	TBD	Task Orders	Based on Task Orders

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\*Line Item No. 01: At the time of award a Phase-In Task will be awarded.

(b) OPTION PERIODS:

If Option Periods are exercised pursuant to Clause 52.217-9, "Option to Extend the Term of the Contract," the contractor shall provide all resources (except as may be expressly stated in this contract as furnished by the Government) necessary to furnish the items below in accordance with the Description/Specifications/Work Statement in Section C and as identified under individual task orders.

1. Item No.	2. Description	3. Qty	4. Unit	5. Amount
<b>OPTION PERIOD 1</b>				
03	Space Technology Research And Development set forth in Section F., paragraph F.2 (c); including the Contract Data Requirements List set forth in Attachment J.1.(a) 2	TBD	Task Orders	Based on Task Orders
<b>OPTION PERIOD 2</b>				
04	Space Technology Research And Development set forth in Section F., paragraph F.2 (d); including the Contract Data Requirements List set forth in Attachment J.1.(a) 2	TBD	Task Orders	Based on Task Orders
<b>OPTION PERIOD 3</b>				
05	Space Technology Research And Development set forth in Section F., paragraph F.2 (e); including the Contract Data Requirements List set forth in Attachment J.1.(a) 2	TBD	Task Orders	Based on Task Orders

(END OF CLAUSE)

**B.2 MINIMUM/MAXIMUM AMOUNT OF SUPPLIES OR SERVICES (COST REIMBURSEMENT)**

(a) The minimum amount of supplies or services that shall be ordered during the effective period of this contract is **\$250,000 (Estimated Cost and Fixed Fee)**. The maximum amount of supplies or services that may be ordered during the effective period of this contract is **\$45,000,000 (Estimated Cost and Fixed Fee)**. All orders placed under this contract will be applied to the minimum and maximum specified in this paragraph.

(b) The minimum amount is reached when the sum of the dollar amounts of all ordered supplies or services, except for any adjustments made pursuant to the Limitation of Cost or Limitation of Funds clause, equals or exceeds the minimum amount stated in paragraph (a).

(c) The maximum amount is reached when the sum of the dollar amounts of all ordered supplies or services, except for any adjustments made pursuant to the Limitation of Cost or Limitation of Funds clause, equals the maximum amount stated in paragraph (a).

(d) The maximum amount, if reached, precludes the issuance of further orders for supplies or services under this contract. However, reaching the maximum amount does not preclude adjustments to the dollar amounts of existing placed orders, for actions that are within the scope of the placed orders, and which are made pursuant to existing contract authority, such as the Changes clause.

(e) The maximum amount may be adjusted unilaterally by the Government on an annual basis. Historic, current, and/or projected workload requirements will be used to determine the amount of upward adjustment. In no event will the adjusted maximum amount exceed 10% of the original maximum amount.

(END OF CLAUSE)

**B.3 SUPPLEMENTAL TASK ORDERING PROCEDURES (COST REIMBURSEMENT)**

(a) When the Government issues a request for a "task plan" to the Contractor in accordance with the Clause entitled "Task Ordering Procedure" of this contract, the Contractor shall prepare its estimate of the labor hours, labor categories, indirect costs, and other direct costs required to perform the task order requirements. The Contractor shall use only those appropriate labor and indirect cost rates which may be less than, but shall not exceed, the rates found in Attachment J.1(a) 5 for all task orders issued in accordance with the "Task Ordering Procedure" clause of this contract. Notwithstanding the use of the rates set forth in Attachment J.1(a) 5 for estimating purposes, the Contractor will be reimbursed costs based on their current DCAA approved rates subject to audit by the Government. Indirect rates are subject to the ceiling limits set forth in Clause B.4.

(b) The Contractor's proposed approach/pricing of the representative tasks set forth in its proposal, if required, for award of this contract shall be used as reference by the Contracting Officer in negotiating tasks with the Contractor which are issued under this contract, but only to the extent portions of a representative task are relevant to portions of a task actually issued.

(c) The Government and Contractor agree that the fixed fee percentage specified in Attachment J.1(a) 5 shall be used to calculate the fixed fee dollars on all task orders issued in accordance with the "Task Ordering Procedure" clause of this contract. For task orders under this contract, the fixed fee amount associated with the task order shall be the fixed fee percentage applied and calculated on the total negotiated **estimated** cost of the task order.

(END OF CLAUSE)

**B.4 LIMITATION OF INDIRECT COSTS**

a. Within each of the Contractor's fiscal years, the Contractor shall not charge or be reimbursed by the Government, under this or any other Government contract, for indirect costs in excess of the individual indirect expense dollars derived by the application of the indirect cost ceiling rates to the appropriate base(s) as set forth in Attachment J.1(a) 5.

b. The limitations may be adjusted at the discretion of the Contracting Officer to the extent that increases to the Contractor's indirect costs are caused by:

(i) New or revised statutes and court decisions and/or written ruling or regulation by the Internal Revenue Service or any other taxing authority.

(ii) Wage determinations and/or regulations issued by the Department of Labor pursuant to the Service Contract Act of 1965, as amended.

c. A proposal for any adjustment under paragraph (b) must be in sufficient detail to establish that the cause of the amount of adjustment requested was solely due to the permitted conditions stated in the paragraph. It must be submitted no later than 60 days after the condition(s) become known, or should have become known, to the Contractor. The amount of adjustment, if any, is at the discretion of the Contracting Officer and shall not be subject to the Disputes clause.

(END OF CLAUSE)

**B.5 ESTIMATED COST INCREASES**

(a) The scope of the task, and any deliverables thereunder, shall be defined in sufficient detail for the Government and the contractor to distinguish between changes in scope and overrun. In the event the contractor is unable to complete the task within the hours set forth in the task order, additional hours under the task shall be considered non-fee bearing, unless the CO modifies the task to recognize additional or revised requirements. On cost-plus-fixed-fee contracts, a fixed fee shall be established for each task based on projected hours. In the event the contractor requires additional hours to complete the task due to an overrun, no additional fee will be paid for the additional hours.

(b) The Contractor shall notify the Contracting Officer in writing when the Contractor has reason to believe that the total cost for performance of this contract, or any individual task order, exclusive of any fee, will be either greater or substantially less than the total estimated cost stated in this contract or in the task order. Notification shall not be delayed pending preparation of a proposal.

(c) A proposal is required to support a request for an increase in the estimated cost of the contract or the task order. The proposal should be submitted as soon as possible after the above notification but no later than 115 days before the incurred costs are expected to exceed the estimated cost. This will allow adequate time for the Government to evaluate the proposal and to mutually establish any increase in estimated cost with the Contractor.

(d) (1) The proposal shall be submitted in the following format unless some other format is directed or approved by the Contracting Officer:

Incurred costs to date  
 Projected cost to completion  
 Total cost at completion  
 Current negotiated estimated cost  
 Requested increase in estimated cost

(2) The "projected cost to completion" shall consist of the following "cost or pricing data" unless the Contracting Officer requests or approves the submittal of a greater or lesser amount of information:

(i) Elements of cost with supporting detail for estimated direct labor hours, direct and indirect rates, materials and subcontracts, and other elements.

(ii) Supporting explanation for the increases and projections, sufficient for the Government to understand the reasons for the increased estimated cost.

(e) In rare circumstances, changes in task focus may require the addition of labor categories beyond the categories included in J.1(a)5. In these cases a request must be submitted by the contractor to the Contracting Officer, demonstrating the insufficiency of the existing labor categories, a description of the proposed labor category including the education and experience levels, proposed and ceiling labor rates, and a cross reference to other contracts that include the proposed labor categories. These additional labor categories, rates and descriptions will be negotiated on a case-by-case basis, and upon determination by the Government that they are fair and reasonable, will be incorporated by modification into Section B of the contract.

(END OF CLAUSE)

**B.6 ESTIMATED COST AND FIXED FEE (NFS 1852.216-74) (DECEMBER 1991)**

The estimated cost of this contract is to be negotiated by task order exclusive of the fixed fee to be negotiated by task order. The total estimated cost and fixed fee is to be negotiated by task order.

(END OF CLAUSE)

**B.7 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 contract is [REDACTED]. This allotment is for costs and covers the following estimated period of performance: April 30, 2010.

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

B-4

SUMMARY OF CONTRACT FUNDING	FROM	BY	TO
Estimated Cost	\$0.00	[REDACTED]	[REDACTED]
Fixed Fee	\$0.00	[REDACTED]	[REDACTED]
Total Cost Plus Fixed Fee	\$0.00	[REDACTED]	[REDACTED]

B-4

(END OF CLAUSE)

**B.8. LIMITATIONS ON PERIOD OF PERFORMANCE**

The period of performance for issuing task orders under this contract is for two years from the effective date of the contract. This contract also includes three one-year options for additional ordering periods if exercised by the Government. Each individual task order will include its own period of performance.

(END OF CLAUSE)

[END OF SECTION]

SECTION C – DESCRIPTION/SPECIFICATIONS/STATEMENT OF WORK

**C.1 DESCRIPTION/SPECIFICATION/WORK STATEMENT**

Work shall be accomplished in accordance with the Specification/Work Statement incorporated in Section J.

(END OF CLAUSE)

[END OF SECTION]

SECTION D – PACKAGING AND MARKING

**D.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE**

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

**I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)**

· CLAUSE  
NUMBER DATE TITLE

None included by reference.

**II. NASA FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES**

· CLAUSE  
NUMBER DATE TITLE

1852.211-70	SEP 2005	PACKAGING, HANDLING, AND TRANSPORTATION
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(END OF CLAUSE)

## SECTION E – INSPECTION AND ACCEPTANCE

**E.1 CLAUSES INCORPORATED BY REFERENCE**

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

**I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)**

CLAUSE  
NUMBER    DATE    TITLE

52.246-3	MAY 2001	INSPECTION OF SUPPLIES-- COST-REIMBURSEMENT
52.246-5	APR 1984	INSPECTION OF SERVICES-- COST-REIMBURSEMENT
52.246-8	MAY 2001	INSPECTION OF RESEARCH AND DEVELOPMENT COST-REIMBURSEMENT

**II. NASA FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES**

None included by reference.

(END OF CLAUSE)

**E.2. MATERIAL INSPECTION AND RECEIVING REPORT (NFS 1852.246-72) (AUG 2003)**

(a) At the time of each delivery to the Government under this contract, the Contractor shall furnish a Material Inspection and Receiving Report (DD Form 250 series) prepared in triplicate, an original and 2 copies.

(b) The Contractor shall prepare the DD Form 250 in accordance with NASA FAR Supplement 1846.6. The Contractor shall enclose the copies of the DD Form 250 in the package or seal them in a waterproof envelope, which shall be securely attached to the exterior of the package in the most protected location.

(c) When more than one package is involved in a shipment, the Contractor shall list on the DD Form 250, as additional information, the quantity of packages and the package numbers. The Contractor shall forward the DD Form 250 with the lowest numbered package of the shipment and print the words "CONTAINS DD FORM 250" on the package.

(END OF CLAUSE)

[END OF SECTION]

## SECTION F – DELIVERIES AND PERFORMANCE

**F.1 CLAUSES INCORPORATED BY REFERENCE**

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

**I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)**

CLAUSE  
NUMBER DATE TITLE

52.242-15	AUG 1989	STOP-WORK ORDER (ALTERNATE I) (APR 1984)
52.247-34	NOV 1991	F.O.B. DESTINATION

**II. NASA FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES**

None included by reference.

(END OF CLAUSE)

**F.2 PERIOD OF PERFORMANCE**

The performance period for issuing task orders under this contract is set forth below. Each individual task order will include its own period of performance.

- (a) **PHASE-IN PERIOD**  
The Phase-in Period of this contract shall be one month beginning on the effective date of contract.
- (b) **BASE PERIOD**  
The base period of performance shall be 23 months from end of Phase-in Period.
- (c) **OPTION PERIOD 1**  
If exercised, the period of performance of the first option of this contract shall be twelve months (12) from the end of the Base Period.
- (d) **OPTION PERIOD 2**  
If exercised, the period of performance of the second option of this contract shall be twelve months (12) from the end of Option Period 1.
- (e) **OPTION PERIOD 3**  
If exercised, the period of performance of the third option of this contract shall be twelve months (12) from the end of Option Period 2.

(END OF CLAUSE)

**F.3 PLACE OF PERFORMANCE**

The services to be performed under this contract shall be performed at the following location(s): Moffett Field, CA and at such other locations as may be directed by the Contracting Officer.

(END OF CLAUSE)

**F.4 DELIVERY SCHEDULE**

(a) The Contractor shall deliver the supplies and services as required by this contract and the individual task orders.

(b) Unless specified otherwise, all items shall be delivered to:

NASA-Ames Research Center  
Contract NNA10DE10C  
P.O. Box 1  
Moffett Field, CA 94035-0001  
Attn: Michael Olson, M/S 234-1

(c) All reports and documentation shall be mailed in accordance with Paragraph F.5, *Delivery of Reports*.

(END OF CLAUSE)

**F.5 DELIVERY OF REPORTS**

Unless otherwise specified, all reports shall be addressed to the recipients listed in Section J, Attachment J.1(a) 2, "Contract Data Requirements List." Reports specific to task orders will be specified in the individual task order.

(END OF CLAUSE)

**F.6 NOTICE OF DELAY (ARC 52.249-90) (FEB 1997)**

If, because of technical difficulties, the Contractor becomes unable to complete the contract work at the time specified, notwithstanding the exercise of good faith and diligent efforts in performing the work called for under this contract, the Contractor shall give the Contracting Officer written notice of the anticipated delay and the reasons for it. The notice and reasons shall be delivered promptly after the condition creating the anticipated delay becomes known to the Contractor but in no event less than 45 days before the completion date specified in this contract, unless otherwise permitted by the Contracting Officer. When notice is given, the Contracting Officer may extend the time specified in the schedule for such period as is deemed advisable.

(END OF CLAUSE)

[END OF SECTION]

SECTION G – CONTRACT ADMINISTRATION DATA

**G.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE**

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

**I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)**

CLAUSE NUMBER	DATE	TITLE
NONE BY REFERENCE		

**II. NASA FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES**

CLAUSE NUMBER	DATE	TITLE
1852.227-86	DEC 1987	COMMERCIAL COMPUTER SOFTWARE – LICENSING
1852.242-71	DEC 1988	TRAVEL OUTSIDE OF THE UNITED STATES
1852.242-73	NOV 2004	NASA CONTRACTOR FINANCIAL MANAGEMENT REPORTING
1852.245-76	OCT 1988	LIST OF GOVERNMENT FURNISHED PROPERTY (1 <sup>st</sup> sentence insert: "See Section J.1(a) 3, "GOVERNMENT PROPERTY LIST"; 2 <sup>nd</sup> sentence insert: "AMES Research Center, or as defined in each task order.")

(END OF CLAUSE)

**G.2 RESERVED**

**G.3 SUBMISSION OF VOUCHERS FOR PAYMENT. (NFS 1852.216-87) (MAR 1998)**

(a) The designated billing office for cost vouchers for purposes of the Prompt Payment clause of this contract is indicated below. Public vouchers for payment of costs shall include a reference to the number of this contract.

(b) (1) If the contractor is authorized to submit interim cost vouchers directly to the NASA paying office, the original voucher should be submitted to:

NSSC – FMD Accounts Payable  
Bldg. 1111, C. Road  
Stennis Space Center, MS 39529

(2) For any period that the Defense Contract Audit Agency has authorized the Contractor to submit interim cost vouchers directly to the Government paying office, interim vouchers are not required to be sent to the Auditor, and are considered to be provisionally approved for payment, subject to final audit.

(3) Copies of vouchers should be submitted as directed by the Contracting Officer.

(c) If the contractor is not authorized to submit interim cost vouchers directly to the paying office as described in paragraph (b), the contractor shall prepare and submit vouchers as follows:

(1) One original Standard Form (SF) 1034, SF 1035, or equivalent Contractor's attachment to:

[Insert the appropriate NASA or DCAA mailing office address for submission of cost vouchers]

(2) Five copies of SF 1034, SF 1035A, or equivalent Contractor's attachment to the following offices by insertion in the memorandum block of their names and addresses:

(i) Copy 1 NASA Contracting Officer, STAMPED "INFO COPY"

NASA-Ames Research Center  
Contract Specialist, M/S 241-1  
P.O. Box 1  
Moffett Field, CA 94035-0001

(ii) Copy 2 Auditor

Defense Contract Audit Agency  
(Address Completed at Time of Award)

(iii) Copy 3 Contractor

(iv) Copy 4 Contract administration office, "STAMPED "INFO COPY" and

(v) Copy 5 Project management office.

(3) The Contracting Officer may designate other recipients as required.

(d) Public vouchers for payment of fee shall be prepared similarly to the procedures in paragraphs (b) or (c) of this clause, whichever is applicable, and be forwarded to:

NSSC – FMD Accounts Payable  
Bldg. 1111, C. Road  
Stennis Space Center, MS 39529

This is the designated billing office for fee vouchers for purposes of the Prompt Payment clause of this contract.

(e) In the event that amounts are withheld from payment in accordance with provisions of this contract, a separate voucher for the amount withheld will be required before payment for that amount may be made.

(END OF CLAUSE)

**G.4 DESIGNATION OF NEW TECHNOLOGY REPRESENTATIVE AND PATENT REPRESENTATIVE. (NFS 1852.227-72) (JUL 1997)**

(a) For purposes of administration of the clause of this contract entitled New Technology or Patent Rights - Retention by the Contractor (Short Form), whichever is included, the following named representatives are hereby designated by the Contracting Officer to administer such clause:

TITLE	OFFICE CODE	ADDRESS (INCLUDING ZIP CODE)
New Technology Representative	VP	NASA-Ames Research Center, M/S 202A-3 Bldg. 202 P.O. Box 1 Moffett Field, CA 94035-0001
Patent Representative	DL	NASA-Ames Research Center, M/S 202A-3 Bldg. 202 P.O. Box 1 Moffett Field, CA 94035-0001

(b) Reports of reportable items, and disclosure of subject inventions, interim reports, final reports, utilization reports, and other reports required by the clause, as well as any correspondence with respect to such matters, should be directed to the New Technology Representative unless transmitted in response to correspondence or request from the Patent Representative. Inquires or requests regarding disposition of rights, election of rights, or related matters should be directed to the Patent Representative. This clause shall be included in any subcontract hereunder requiring a New Technology clause or Patent Rights - Retention by the Contractor (Short Form) clause, unless otherwise authorized or directed by the Contracting Officer. The respective responsibilities and authorities of the above-named representatives are set forth in 1827.305-370 of the NASA FAR Supplement.

(END OF CLAUSE)

**G.5 TECHNICAL DIRECTION. (NFS 1852.242-70) (SEP 1993)**

(a) Performance of the work under this contract is subject to the written technical direction of the Contracting Officer Technical Representative (COTR), who shall be specifically appointed by the Contracting Officer in writing in accordance with NASA FAR Supplement 1842.270. "Technical direction" means a directive to the Contractor that approves approaches, solutions, designs, or refinements; fills in details or otherwise completes the general description of work or documentation items; shifts emphasis among work areas or tasks; or furnishes similar instruction to the Contractor. Technical direction includes requiring studies and pursuit of certain lines of inquiry regarding matters within the general tasks and requirements in Section C of this contract.

(b) The COTR does not have the authority to, and shall not, issue any instruction purporting to be technical direction that--

- (1) Constitutes an assignment of additional work outside the statement of work;
- (2) Constitutes a change as defined in the changes clause;
- (3) Constitutes a basis for any increase or decrease in the total estimated contract cost, the fixed fee (if any), or the time required for contract performance;
- (4) Changes any of the expressed terms, conditions, or specifications of the

contract; or

(5) Interferes with the contractor's rights to perform the terms and conditions of the contract.

(c) All technical direction shall be issued in writing by the COTR.

(d) The Contractor shall proceed promptly with the performance of technical direction duly issued by the COTR in the manner prescribed by this clause and within the COTR's authority. If, in the Contractor's opinion, any instruction or direction by the COTR falls within any of the categories defined in paragraph (b) of this clause, the Contractor shall not proceed but shall notify the Contracting Officer in writing within 5 working days after receiving it and shall request the Contracting Officer to take action as described in this clause. Upon receiving this notification, the Contracting Officer shall either issue an appropriate contract modification within a reasonable time or advise the Contractor in writing within 30 days that the instruction or direction is--

(1) Rescinded in its entirety; or

(2) Within the requirements of the contract and does not constitute a change under the changes clause of the contract, and that the Contractor should proceed promptly with its performance.

(e) A failure of the contractor and contracting officer to agree that the instruction or direction is both within the requirements of the contract and does not constitute a change under the changes clause, or a failure to agree upon the contract action to be taken with respect to the instruction or direction, shall be subject to the Disputes clause of this contract.

(f) Any action(s) taken by the contractor in response to any direction given by any person other than the Contracting Officer or the COTR shall be at the Contractor's risk.

(END OF CLAUSE)

#### **G.6 CONTRACTOR REQUESTS FOR GOVERNMENT-PROVIDED PROPERTY (DEVIATION) (NFS 1852.245-70) (SEP 2007)**

(a) The Contractor shall provide all property required for the performance of this contract. The Contractor shall not acquire or construct items of property to which the Government will have title under the provisions of this contract without the Contracting Officer's written authorization. Property which will be acquired as a deliverable end item as material or as a component for incorporation into a deliverable end item is exempt from this requirement.

(b)(1) In the event the Contractor is unable to provide the property necessary for performance, and the Contractor requests provision of property by the Government, the Contractor's request shall--

(i) Justify the need for the property;

(ii) Provide the reasons why contractor-owned property cannot be used;

(iii) Describe the property in sufficient detail to enable the Government to screen its inventories for available property or to otherwise acquire property, including applicable manufacturer, model, part, catalog, National Stock Number or other pertinent identifiers;

(iv) Combine requests for quantities of items with identical descriptions and estimated values when the estimated values do not exceed \$100,000 per unit; and

(v) Include only a single unit when the acquisition or construction value equals or

exceeds \$100,000.

(2) Contracting Officer authorization is required for items the Contractor intends to manufacture as well as those it intends to purchase.

(3) The Contractor shall submit requests to the Contracting Officer no less than 30 days in advance of the date the Contractor would, should it receive authorization, acquire or begin fabrication of the item.

(c) The Contractor shall maintain copies of Contracting Officer authorizations, appropriately cross-referenced to the individual property record, within its property management system.

(d) Property furnished from Government excess sources is provided as-is, where-is. The Government makes no warranty regarding its applicability for performance of the contract or its ability to operate. Failure of property obtained from Government excess sources under this clause is insufficient reason for submission of requests for equitable adjustments discussed in the clause at 52.245-1, *Government Property*.

(END OF CLAUSE)

#### **G.7 INSTALLATION-ACCOUNTABLE GOVERNMENT PROPERTY (DEVIATION) (NFS 1852.245-71) (SEP 2007)**

(a) The Government property described in paragraph (c) of this clause may be made available to the Contractor on a no-charge basis for use in performance of this contract. This property shall be utilized only within the physical confines of the NASA installation that provided the property unless authorized by the contracting officer under (b)(1)(iv). Under this clause, the Government retains accountability for, and title to, the property, and the Contractor shall comply with the following:

##### NASA Procedural Requirements (NPRs)

- NPR 4100.1, *NASA Materials Inventory Management Manual*
- NPR 4200.1, *NASA Equipment Management Procedural Requirements*
- NPR 4300.1, *NASA Personal Property Disposal Procedural Requirements*

Property not recorded in NASA property systems must be managed in accordance with the requirements of FAR 52.245-1.

The Contractor shall establish and adhere to a system of written procedures to assure continued, effective management control and compliance with these user responsibilities. Such procedures must include holding employees liable, when appropriate, for loss, damage, or destruction of Government property.

(b)(1) The official accountable recordkeeping, financial control, and reporting of the property subject to this clause shall be retained by the Government and accomplished within NASA management information systems prescribed by the installation Supply and Equipment Management Officer (SEMO) and Financial Management Officer. If this contract provides for the Contractor to acquire property, title to which will vest in the Government, the following additional procedures apply:

(i) The Contractor's purchase order shall require the vendor to deliver the property to the installation central receiving area.

(ii) The Contractor shall furnish a copy of each purchase order, prior to delivery by the vendor, to the installation central receiving area.

(iii) The Contractor shall establish a record of the property as required by FAR 52.245-1, *Government Property*, and furnish to the Industrial Property Officer a DD Form 1149, *Requisition and Invoice/Shipping Document*, (or installation equivalent) to transfer accountability to the Government within 5 working days after receipt of the property by the Contractor. The Contractor is accountable for all contractor-acquired property until the property is transferred to the Government's accountability.

(iv) Contractor use of Government property at an off-site location and off-site subcontractor use require advance approval of the Contracting Officer and notification of the Industrial Property Officer. The property shall be considered Government furnished and the Contractor shall assume accountability and financial reporting responsibility. The Contractor shall establish records and property control procedures and maintain the property in accordance with the requirements of FAR 52.245-1, *Government Property*, until its return to the installation. NASA Procedural Requirements related to property loans shall not apply to offsite use of property by contractors.

(2) After transfer of accountability to the Government, the Contractor shall continue to maintain such internal records as are necessary to execute the user responsibilities identified in paragraph (a) of this clause and document the acquisition, billing, and disposition of the property. These records and supporting documentation shall be made available, upon request, to the SEMO and any other authorized representatives of the Contracting Officer.

(c) The following property and services are provided if checked.

(1) Office space, work area space, and utilities. Government telephones are available for official purposes only.

(2) Office furniture.

(3) Property listed in J.1(a)(3), Space Transportation Division Government Supplied Equipment List

(i) If the Contractor acquires property, title to which vests in the Government pursuant to other provisions of this contract, this property also shall become accountable to the Government upon its entry into Government records.

(ii) The Contractor shall not bring to the installation for use under this contract any property owned or leased by the Contractor, or other property that the Contractor is accountable for under any other Government contract, without the Contracting Officer's prior written approval.

(4) Supplies from stores stock.

(5) Publications and blank forms stocked by the installation.

(6) Safety and fire protection for Contractor personnel and facilities.

(7) Installation service facilities:

ArcJet Complex, Hypervelocity Free-Flight Facility (HFFF), Electric Arc Shock Tube (EAST), and other Center facilities (such as laboratories and supercomputers as required for completion of task requirements).

(8) Medical treatment of a first-aid nature for Contractor personnel injuries or illnesses sustained during on-site duty.

(9) Cafeteria privileges for Contractor employees during normal operating hours.

(10) Building maintenance for facilities occupied by Contractor personnel.

(11) Moving and hauling for office moves, movement of large equipment, and delivery of supplies. Moving services may be provided on-site, as approved by the Contracting Officer.

(END OF CLAUSE)

**G.8. IDENTIFICATION AND MARKING OF GOVERNMENT EQUIPMENT  
(DEVIATION) (NFS 1852.245-74) (SEP 2007)**

(a) The Contractor shall identify all equipment to be delivered to the Government using NASA Technical Handbook (NASA-HDBK) 6003, Application of Data Matrix Identification Symbols to Aerospace Parts Using Direct Part Marking Methods/Techniques, and NASA Standard (NASA-STD) 6002, Applying Data Matrix Identification Symbols on Aerospace Parts Handbook. This includes deliverable equipment listed in the schedule and other equipment when NASA directs physical transfer to NASA or a third party. The Contractor shall identify property in both machine and human readable form unless the use of a machine readable-only format is approved by the NASA Industrial Property Officer.

(b) Property shall be marked in a location that will be human readable, without disassembly or movement of the property, when the items are placed in service unless such placement would have a deleterious effect on safety or on the item's operation.

(c) Concurrent with equipment delivery or transfer, the Contractor shall provide the following data in an electronic spreadsheet format:

- (1) Item Description.
- (2) Unique Identification Number (License Tag).
- (3) Unit Price.
- (4) An explanation of the data used to make the unique identification number.

(d) For items physically transferred under paragraph (a) the following additional data is required:

- (1) Date originally placed in service.
- (2) Item condition.
- (3) Date last serviced.

(e) The data required in paragraphs (c) and (d) shall be delivered to the NASA center receiving activity listed below:

NASA-Ames Research Center  
Central Shipping and Receiving, M/S 255-3  
Bldg. 255,  
P.O. Box 1  
Moffett Field, CA 94035-0001

Mark for: Michael Olson, COTR

(f) The contractor shall include the substance of this clause, including this paragraph (f), in all subcontracts that require delivery of equipment.

(END OF CLAUSE)

**G.9 PROPERTY MANAGEMENT CHANGES (DEVIATION) (NFS 1852.245-75) (SEP 2007)**

(a) The Contractor shall submit any changes to standards and practices used for management and control of Government property under this contract to the assigned property administrator and Industrial Property Officer (IPO), prior to making the change whenever the change –

- (1) Employs a standard that allows increase in thresholds or changes the timing for reporting loss, damage, or destruction of property;
- (2) Alters physical inventory timing or procedures;
- (3) Alters recordkeeping practices;
- (4) Alters practices for recording the transport or delivery of Government property; or
- (5) Alters practices for disposition of Government property.

(b) The Contractor shall contact the IPO at:

NASA-Ames Research Center  
Attn: Industrial Property Officer, M/S 255-1  
Bldg. 255-1, Room 102  
P.O. Box 1  
Moffett Field, CA 94035-0001  
(650) 604-6882, [Maria-elena.Lopez-1@nasa.gov](mailto:Maria-elena.Lopez-1@nasa.gov)

(END OF CLAUSE)  
[END OF SECTION]

## SECTION H – SPECIAL CONTRACT REQUIREMENTS

**H.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE**

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

**I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)**

CLAUSE NUMBER	DATE	TITLE
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None included by reference

**II. NASA FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES**

CLAUSE NUMBER	DATE	TITLE
1852.208-81	NOV 2004	RESTRICTIONS ON PRINTING AND DUPLICATING
1852.223-70	APR 2002	SAFETY AND HEALTH
1852.223-75	FEB 2002	MAJOR BREACH OF SAFETY OR SECURITY
1852.225-70	FEB 2000	EXPORT LICENSES; insert "Ames Research Center" in paragraph (b)
1852.235-73	DEC 2006	FINAL SCIENTIFIC AND TECHNICAL REPORTS (ALT II) (DEC 2005)
1852.242-72	AUG 1992	OBSERVANCE OF LEGAL HOLIDAYS (ALTERNATE I) (SEP 1989) (ALTERNATE II) (OCT 2000)
1852.244-70	APR 1985	GEOGRAPHIC PARTICIPATION IN THE AEROSPACE PROGRAM

(END OF CLAUSE)

**H.2 ORGANIZATIONAL CONFLICTS OF INTEREST, AND LIMITATION OF FUTURE CONTRACTING**

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

(b) The nature of this potential conflict is:

The Space Technology Division has both NASA and non-NASA customers. Some of those customers include aerospace vehicle designers and manufacturers. Because contractors are involved in new technology development, testing, and fabrication, they are expected to have access to government sensitive and third party proprietary data. If the awardee or a subcontractor were an aerospace vehicle designer or manufacturer, other aerospace vehicle manufacturers might cease to use NASA-ARC expertise and facilities. This would negate the purpose of our laboratories and facilities as a national resource. However, because the Space Technology Division projects only involve Thermal Protection Materials and Thermal Protection Systems such as heat shields for atmospheric reentry, contractors developing non-related components for space vehicles should not be excluded.

Further, as part of supporting the Space Technology Division in the development of

technologies for use in the design and fabrication of prototype vehicles that travel at hypervelocities in the atmosphere of Earth and other bodies of the solar system and support nanotechnology, advanced materials, sensors and devices research, contractor may participate in requirements identification and specification, statement of work development, benchmarking, and other activities associated with Government procurement (i.e., Request for Proposals, Cooperative Agreement Notices, NASA Research Announcements) and other Government activities where access to Government sensitive data or third-party proprietary data is necessary. Access to such data or participation in developing requirements for future competitions also creates a potential conflict of interest. Access by the awardee to Government-sensitive or third party proprietary data creates a potential organizational conflict of interest.

(c) To avoid, neutralize, or mitigate the potential organizational conflict of interest, the following restrictions upon future contracting shall apply:

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

(2) The Contractor shall not, during the performance of the contract and for a period of three years following completion of performance thereof, engage in the following activities:

(i) Design, development, or production of Thermal Protection Materials and Thermal Protection Systems such as heat shields for atmospheric reentry; or

(ii) Participate in competitions, as either a prime proposer or a proposed subcontractor, based upon data obtained because of the Contractor's access to, and support of, the STRAD technical requirements, or participate in competitions, as either a prime proposer or a proposed subcontractor, where the Contractor participated in defining requirements of the competition as a result of supporting the STRAD technical requirements.

(d) If, in the performance of work under this Contract, the Contractor has access to Government Sensitive Data or third-party proprietary data, the Contractor shall protect such data from unauthorized use or disclosure so long as it remains proprietary. In addition, the Contractor shall not be permitted to use such data other than in performance under this Contract, unless:

(1) It receives the explicit written permission of the owner of such data and the Contracting Officer; or

(2) Such data has been released or otherwise made available to the public by the Government or the owner of the third-party proprietary data.

In addition, the Contractor agrees that to the extent it receives or is given access to proprietary data, data protected by the Privacy Act of 1974 (5 U.S.C. 552a), or other confidential or privileged technical, business, or financial information under this Contract, it shall treat such information in accordance with any use or dissemination restrictions imposed on such information.

Further, the Contractor shall not submit an unsolicited proposal to the Government which is based on such data until one year after such data is released or otherwise made available to the public; further, any unsolicited proposal submitted pursuant to this provision shall identify any relationship to work produced under this contract and any proposed use of such data.

(e) (1) If, in the performance of work under this Contract, the Contractor enters into a separate agreement with a company for the protection of Government Sensitive Data or third-party proprietary

data, the Contractor shall furnish a copy of that agreement to the Contracting Officer.

(2) The Contractor must educate its employees, through formal training, not to divulge Government Sensitive Data or third-party proprietary data, trade secrets, confidential information, or restricted data of companies received in connection with the performance of work under this Contract. The Contractor shall provide a plan to implement this training for the approval of the Contracting Officer.

(3) The Contractor shall obtain from all employees having access to Government Sensitive Data or third-party proprietary data under this Contract a written agreement which shall prohibit those employees, during the term of their employment and thereafter, from disclosing to others or using for their own behalf, such data received in connection with the performance of work under this Contract, and from retaining a copy of such data after termination of their employment under this Contract.

(f) The term "Contractor" as used in this clause shall include (i) the corporate or other entity executing this Contract with the Government; (ii) such entity's parent, subsidiary, affiliate, or successor entities to the extent that the parent, subsidiary, affiliate, or successor entity has responsibility for the performance of work under this Contract; and (iii) the Contractor's subcontractors that (A) support STRAD, as delineated in the Statement of Work of this Contract or (B) handle, receive, reduce, interpret, or transmit data obtained, used, or produced in conjunction with research programs in STRAD.

(g) The term "Contract" as used in this clause shall include options, extensions, and any successor contracts performed or to be performed by the Contractor without any other contractor intervening.

(h) The term "Data" as used in this clause, means recorded information, regardless of form or media on which it may be recorded. The term includes technical data and computer software. The term further includes Government Sensitive Data or third-party proprietary data including proprietary data, trade secret information, data protected by the Privacy Act of 1974 (5 U.S.C. 552a) and other confidential or privileged technical, business or financial data.

(i) The term "Government Sensitive Data" as used in this clause means data for which the disclosure or use is controlled by the U.S. Statute or implementing published federal regulations or NASA policy and, where so identified, includes data first produced by the Contractor.

(j) The Contractor's Organizational Conflict of Interest Avoidance Plan is incorporated by reference into this contract (see Attachment J.1(a)(7)). This Plan addresses Organizational Conflicts of Interest at the contract level. Each individual task order will state if additional Organizational Conflict of Interest Avoidance Plan may be required by the Contracting Officer to address potential conflicts of interest prior to authorization of that task order.

(k) The Contractor shall include paragraphs (a) through (i) of this clause in every subcontract. The Contractor shall be responsible for ensuring compliance with all of the provisions of this clause by each of its subcontractors.

(END OF CLAUSE)

### **H.3 TASK ORDER PROCEDURE (NFS 1852.216-80) (OCT 1996)**

(a) Only the Contracting Officer may issue task orders to the Contractor, providing specific authorization or direction to perform work within the scope of the contract and as specified in the schedule. The Contractor may incur costs under this contract in performance of task orders and task order modifications issued in accordance with this clause. No other costs are authorized unless otherwise specified in the contract or expressly authorized by the Contracting Officer.

(b) Prior to issuing a task order, the Contracting Officer shall provide the Contractor with the following data:

(1) A functional description of the work identifying the objectives or results desired from the

contemplated task order.

(2) Proposed performance standards to be used as criteria for determining whether the work requirements have been met.

(3) A request for a task plan from the Contractor to include the technical approach, period of performance, appropriate cost information, and any other information required to determine the reasonableness of the Contractor's proposal.

(c) Within 15 calendar days after receipt of the Contracting Officer's request, the Contractor shall submit a task plan conforming to the request.

(d) After review and any necessary discussions, the Contracting Officer may issue a task order to the Contractor containing, as a minimum, the following:

(1) Date of the order.

(2) Contract number and order number.

(3) Functional description of the work identifying the objectives or results desired from the task order, including special instructions or other information necessary for performance of the task.

(4) Performance standards, and where appropriate, quality assurance standards.

(5) Maximum dollar amount authorized (cost and fee or price). This includes allocation of award fee among award fee periods, if applicable.

(6) Any other resources (travel, materials, equipment, facilities, etc.) authorized.

(7) Delivery/performance schedule including start and end dates.

(8) If contract funding is by individual task order, accounting and appropriation data.

(e) The Contractor shall provide acknowledgment of receipt to the Contracting Officer within 5 calendar days after receipt of the task order.

(f) If time constraints do not permit issuance of a fully defined task order in accordance with the procedures described in paragraphs (a) through (d), a task order which includes a ceiling price may be issued.

(g) The Contracting Officer may amend tasks in the same manner in which they were issued.

(h) In the event of a conflict between the requirements of the task order and the Contractor's approved task plan, the task order shall prevail.

(END OF CLAUSE)

#### **H.4 KEY PERSONNEL AND FACILITIES. (NFS 1852.235-71) (MAR 1989)**

(a) The personnel and/or facilities listed below (or specified in the contract Schedule) are considered essential to the work being performed under this contract. Before removing, replacing, or diverting any of the listed or specified personnel or facilities, the Contractor shall (1) notify the Contracting Officer reasonably in advance and (2) submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on this contract.

(b) The Contractor shall make no diversion without the Contracting Officer's written consent; provided, that the Contracting Officer may ratify in writing the proposed change, and that ratification shall constitute the Contracting Officer's consent required by this clause.

(c) The list of personnel and/or facilities (shown below or as specified in the contract Schedule) may, with the consent of the contracting parties, be amended from time to time during the course of the contract to add or delete personnel and/or facilities.

(List here the personnel and/or facilities considered essential, unless they are specified in the contract Schedule.)

**[REDACTED]** - Program Manager

**[REDACTED]** - Reacting Flows Site Supervisor

**[REDACTED]** - Thermal Protection Materials and Systems (TPM/S) Site Supervisor

(END OF CLAUSE)

#### H.5 ADDITIONAL REPORTS OF WORK – RESEARCH AND DEVELOPMENT (NFS 1852.235-74) (FEB 2003)

In addition to the final report required under this contract, the Contractor shall submit the following report(s) to the Contracting Officer:

(a) Monthly progress reports. The Contractor shall submit separate monthly reports of all work accomplished during each month of contract performance. Reports shall be in narrative form, brief, and informal. They shall include a quantitative description of progress, an indication of any current problems that may impede performance, proposed corrective action, and a discussion of the work to be performed during the next monthly reporting period

(b) Quarterly progress reports. The Contractor shall submit separate quarterly reports of all work accomplished during each three-month period of contract performance. In addition to factual data, these reports should include a separate analysis section interpreting the results obtained, recommending further action, and relating occurrences to the ultimate objectives of the contract. Sufficient diagrams, sketches, curves, photographs, and drawings should be included to convey the intended meaning.

(c) Submission dates. Monthly and quarterly reports shall be submitted by the 15th day of the month following the month or quarter being reported. If the contract is awarded beyond the middle of a month, the first monthly report shall cover the period from award until the end of the following month. No monthly report need be submitted for the third month of contract effort for which a quarterly report is required. No quarterly report need be submitted for the final three months of contract effort since that period will be covered in the final report. The final report shall be submitted within 15 days after the completion of the effort under the contract.

(END OF CLAUSE)

#### H.6 EMERGENCY PREPAREDNESS AND RESPONSE (ARC 52.223-90) (SEP 2007)

(a) Contractors shall comply with Ames Procedural Requirements (APR) 1601.4, "Emergency Operations Plan."

(b) Contractors doing business with ARC are also employers in their own right and, as such, are responsible for protecting their employees, the environment, and property from the effects of hazardous events. Contractors shall develop and maintain appropriate emergency response and recovery plans, facility shutdown/startup plans, standard operations procedures, and checklists for emergency response to their facilities and operations. Contractors shall ensure training and

certification of their employees as required to support their emergency response and recovery plan. Contractors shall participate in ARC drills and/or exercises to validate adequacy of emergency response and recovery plans and to ensure contractor employees are trained on how to respond. During a disaster/emergency, the contractor's Project Manager or other line supervisor shall be prepared to provide personnel accountability and facility status information to the designated NASA Facility Manager or Emergency Operations Center (EOC) Representative.

(c) Many contractor employees also serve as emergency response or mission essential resources with regards to performing certain emergency response and recovery functions associated with the overall NASA Ames Research Center and agency response. As such, their emergency response or mission essential roles for the Center and agency need to be identified prior to an emergency or disaster. These individuals must also be notified of their roles, trained in their roles and participate in any drills that serve to increase the Center's effectiveness in responding to and recovering from emergencies and disasters.

(d) The contractor's obligation may include resolution of unusual or emergency situations, pursuant to FAR Part 18, "Emergency Acquisitions." The contractor may be required to assist NASA, within the general scope of work, but in currently unidentified ways, in preparation for, or in response to emergencies. Obligations under this requirement shall only arise under prescribed circumstances that enable NASA to utilize "Emergency Acquisition Flexibilities," as defined at FAR 18.001. If the emergency preparedness and response requirements result in changes to the contract, all contract adjustments will be processed in accordance with the changes clause.

(END OF CLAUSE)

#### **H.7 DISASTER ASSISTANCE AND RESCUE TEAM (DART) PARTICIPATION (ARC 52.223-91) (APR 2004)**

a. Contractor employees are eligible to participate in the Disaster Assistance and Rescue Team (DART) if approved in writing by the Contractor and appointed by the Government. If a Contractor approves of an employee's participation, the contractor agrees to modify the employee's position description to include participation in DART, and to provide additional indemnification (e.g., worker's compensation insurance, general liability, etc.) as may be necessary to protect its employee and/or the Government while the employee is participating in the program.

b. DART Definition. This team is comprised of civil service, contractor, Ames Associate, resident agent, and military personnel that work at Ames Research Center, the NASA Research Park, and Moffett Federal Airfield. The team composition includes, but is not limited to, scientists, engineers, wind tunnel mechanics, aircraft mechanics, facility maintenance personnel, computer specialists, industrial hygienists, safety professionals, heavy equipment operators, administrative personnel, managers, procurement officials, and data specialists. DART is an umbrella organization that has ten functional groups. The groups are Search, Rescue, Hazardous Materials Response, Damage and Utility Control, Structural Assessment, Emergency Communications, Medical, Logistics, Technical Support, and Emergency Operations Center as well as the Emergency Communications Facility. Typically, participation will involve approximately 5% of the employee's (full) time, except for initial training/orientation, which will involve approximately 10% of the employee's (full) time. The executive management at Ames Research Center strongly encourages contractor participation on DART, which needs all of our support, as it has proven to be a valuable element of the Center's Emergency Service Program.

(END OF CLAUSE)

#### **H.8 SUBCONTRACTING AND DATA RIGHTS (ARC 52.227-97) (OCT 2006) ALTERNATE I (OCT 2006)**

(a) It is strongly recommended that the Contractor flow down the data rights provisions of this contract to lower tier subcontractors to ensure that it can fulfill its data rights obligations to the Government. See Clause FAR 52.227-14(h), *Rights in Data—General*. The Contractor shall be held responsible to obtain rights for the Government where it fails to fulfill such obligations.

(b) Pursuant to Clause FAR 52.227-14(c)(2), the Contractor must obtain Contracting Officer approval before incorporating any data not first produced under the Contract into data delivered under the contract. Before delivering such data, the Contractor must identify it and grant the Government, or acquire on its behalf, the broad licenses required by subparagraph (c) of the *Rights in Data—General* clause.

(c) The Contractor shall make the representation required by FAR 52.227-15 for each contract task order. On a case-by-case basis, the Government will insert the purposes, rights or limitations under which the Government can use Limited Rights Data and Restricted Rights Software into the alternate clauses II and III of FAR 52.227-14.

(END OF CLAUSE)

**H.9 INFORMATION INCIDENTAL TO CONTRACT ADMINISTRATION  
(ARC 52.227-98) (OCT 2004)**

NASA shall have unlimited rights in information incidental to contract administration including administrative and management information created by the Contractor and specified for delivery to NASA in performance of the contract, expressly excluding financial information. Specifically, NASA shall have the right to release such administrative and management information to any third party to satisfy NASA's requirements.

(END OF CLAUSE)

**H.10 PATENT RIGHTS**

The RFP includes the Patent Rights-Retention by the Contractor Clause (FAR 52.227-11), as modified by 1852.227-11. It is anticipated that the Contractor may have Contractor background inventions that could be applied to Contract research and incorporated into deliverables under the Contract. The Government may need rights to use such Contractor background inventions in order to practice technologies produced under this Contract in other Government contracts. Thus, Contracting Officer permission is required before Contractor background inventions may be included in Contract deliverables. To the extent a contractor background invention has been Federally funded, the Government will receive its government-purpose license rights to practice the background invention. Where there is no Federal funding of the background invention, the Contractor will identify to the Contracting Officer the rights that it proposes to grant the Government to use such invention in other Government contracts. The Government shall receive a government-purpose license to practice any contractor background invention where such Contracting Officer permission is not obtained prior to incorporating its background inventions into Contractor work.

(END OF CLAUSE)

**H.11 PERFORMANCE ASSESSMENT**

a) As part of the Government's surveillance activities a periodic performance assessment will be conducted under this contract. This information will be provided to the contractor for corrective actions and performance improvement. In addition, performance assessments will be considered by the Government in its unilateral determination as to whether to exercise options for continued performance in accordance with clause F.2. Additionally, these assessments may be considered as part of past performance evaluations for future NASA requirements and may be ascertained by other organizations requesting past performance information.

b) Examples of performance factors that may be used by the Government include but are not limited to the following:

Factor:	Description:
OVERALL MANAGEMENT	Performance in attracting, developing, and retaining professional and management staff that meet the requirements of the contract. Contractor's management policies and procedures (including intellectual property management, organizational conflicts of interest, management and protection of data, handling of data and export control).

QUALITY	Quality of the work performed under the task orders.
TIMELINESS	Timeliness of completing the task order milestones and submitting deliverables.
PRICE/COST	Ability to control, adjust, and accurately project contract costs (estimated contract costs, not budget or operating plan costs). Ability to control the management and administration costs for this contract. Ability to control the direct labor, indirect and overtime costs. Optimal allocation of resources including the use of part-time personnel. Cost reductions through the use of cost savings programs, cost avoidance programs, alternate designs and process methods. Reduced purchasing cost through increased use of competition will also be assessed.

c) Periodic feedback to the Contractor will include an assessment of overall contract performance.

(END OF CLAUSE)

## H.12 INCORPORATION OF THE CONTRACTOR'S PROPOSAL

The Contractor's Mission Suitability proposal number ERC-00-1567-08-CV, as amended by the final proposal revision entitled "Space Technology Research and Development (STRAD)" is hereby incorporated into this contract by reference.

(END OF CLAUSE)

## H.13 MANAGEMENT AND PROTECTION OF DATA (ARC 52.227-93) (JUL 1988)

(a) In the performance of this contract it is anticipated that the Contractor may have access to, be furnished, use, or generate the following types of data (recorded information):

- (1) data submitted to the Government with limited rights or restricted rights notices;
- (2) data of third parties which the Government has agreed to handle under protective arrangements; and
- (3) data generated by or on behalf of the Government which the Government intends to control the use and dissemination thereof.

(b) In order to provide management appropriate for protecting the interests of the Government and other owners of such data, the Contractor agrees with respect to data in category (a)(1) above, and with respect to any data in categories (a)(2) and (a)(3) when so identified by the Contracting Officer, to:

- (1) use and disclose such data only to the extent necessary to perform the work required under this contract, with particular emphasis on restricting disclosure of the data to those persons who have a definite need for the data in order to perform under this contract;
- (2) not reproduce the data unless reproduction of the data is specifically permitted elsewhere in the contract or by the Contracting Officer;
- (3) refrain from disclosing the data to third parties without the written consent of the Contracting Officer; and
- (4) return or deliver the data including all copies thereof to the Contracting Officer or his designated recipient when requested by the Contracting Officer.

(END OF CLAUSE)

## H.14 HANDLING OF DATA (ARC 52.227-96) (JUN 1989)

(a) Paragraph (d)(1) of the "Rights in Data-General" clause of this contract permits the Government to restrict the Contractor's right to use, release to others, reproduce, distribute, or publish

any data first produced or specifically used by the Contractor in the performance of the contract provided such restriction is expressly set forth in the contract. Pursuant to this authority, the following restrictions shall apply to such data and shall be included, in substance, in all subcontracts:

(b) Data specifically used.

(1) In the performance of this contract, it is anticipated the Contractor may have access, or be furnished, data (including financial, administrative, cost or pricing, or management information as well as technical data or computer software) of third parties which the Government has agreed to handle under protective arrangements, as well as such Government data for which the Government intends to control the use and dissemination.

(2) In order to protect the interests of the Government and the owners of such data, the Contractor agrees, with respect to such third party or Government data that is either marked with a restrictive legend or specifically identified in this contract or in writing by the Contracting Officer as being subject to this clause, to use and disclose such data only to the extent necessary to perform the work required under this contract, preclude disclosure of such data outside the Contractor's organization, and return or dispose of such data as directed by the Contracting Officer when the data is no longer needed for contract performance.

(3) Notwithstanding (2) above, the Contractor shall not be restricted in the use and disclosure of any data that becomes generally available without breach of this clause by this Contractor, is known to or is developed by the Contractor independently of any disclosure of proprietary, restricted, or confidential data hereunder, or is rightfully received by the Contractor from a third party without restriction.

(c) Data first produced.

Data first produced by the Contractor under this contract may include data for which the Government wants to control the use and dissemination. The Contracting Officer may require, or this contract may presently specify, that the Contractor apply restrictive legends to such identified data prior to delivery to the Government, or to third parties at the Government's direction, that restrict the use and disclosure of the data by any third party recipient. However, such restrictive legends shall in no way affect the Contractor's or the Government's rights to such data as provided in the "Rights in Data--General" clause of this contract.

(END OF CLAUSE)

**H.15 SEVERANCE PAY (ARC 52.231-90) (JUN 2008)**

In conjunction with FAR 31.205-6(g), the severance pay cost shall not exceed 40 hours pay for each year of employment per employee up to a maximum of 80 hours per eligible employee. Severance cost eligibility computation for reimbursement shall also be limited to only the period of employment on the service contract at Ames Research Center. In no event shall the Government reimburse the Contractor for severance cost for employees who voluntarily accept employment in place with the succeeding contractor within ninety (90) days after completion of the current contract.

(End of Clause)

[END OF SECTION]

## PART II - CONTRACT CLAUSES

## SECTION I - CONTRACT CLAUSES

**I.1. CLAUSES INCORPORATED BY REFERENCE. 52.252-2 (FEB 1998)**

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es): Federal Acquisition Regulation (FAR) clauses:

<http://www.acqnet.gov/far/>

NASA FAR Supplement (NFS) clauses:

<http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm>

(END OF CLAUSE)

**I.2 LISTING OF CLAUSES INCORPORATED BY REFERENCE**

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

The full text of the clause is available at the addresses contained in clause 52.252-2, Clauses Incorporated by Reference, of this contract.

(END OF CLAUSE)

**I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)**

CLAUSE NUMBER	DATE	TITLE
52.202-1	JUL 2004	DEFINITIONS
52.203-3	APR 1984	GRATUITIES
52.203-5	APR 1984	COVENANT AGAINST CONTINGENT FEES
52.203-6	SEP 2006	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT
52.203-7	JUL 1995	ANTI-KICKBACK PROCEDURES
52.203-8	JAN 1997	CANCELLATION, RESCISSION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY
52.203-10	JAN 1997	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY
52.203-12	SEP 2007	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS
52.203-13	DEC 2008	CONTRACTOR CODE OF BUSINESS ETHICS AND CONDUCT
52.203-14	DEC 2007	DISPLAY OF HOTLINE POSTER(S)
52.204-4	AUG 2000	PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER (insert in paragraph (b)(3): Poster: "IT'S YOUR TAX MONEY" may be obtained at <a href="http://oig.nasa.gov/hotline.html">http://oig.nasa.gov/hotline.html</a> )
52.204-7	APR 2008	CENTRAL CONTRACTOR REGISTRATION
52.209-6	SEP 2006	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT
52.211-15	APR 2008	DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS

52.215-2	JUN 1999	AUDIT AND RECORDS – NEGOTIATION
52.215-8	OCT 1997	ORDER OF PRECEDENCE - UNIFORM CONTRACT FORMAT
52.215-11	OCT 1997	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA – MODIFICATIONS
52.215-13	OCT 1997	SUBCONTRACTOR COST OR PRICING DATA – MODIFICATIONS
52.215-14	OCT 1997	INTEGRITY OF UNIT PRICES
52.215-15	OCT 2004	PENSION ADJUSTMENTS AND ASSET REVERSIONS
52.215-17	OCT 1997	WAIVER OF FACILITIES CAPITAL COST OF MONEY
52.215-18	JUL 2005	REVERSION OR ADJUSTMENT OF PLANS FOR POSTRETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS
52.215-19	OCT 1997	NOTIFICATION OF OWNERSHIP CHANGES
52.216-7	DÉC 2002	ALLOWABLE COST AND PAYMENT (INSERT "30 <sup>TH</sup> " IN PARAGRAPH (a)(3))
52.216-18	OCT 1995	ORDERING (Insert "DATE OF CONTRACT AWARD" through "TWO YEARS FROM THE EFFECTIVE DATE OF THE CONTRACT" in paragraph (a))
52.216-19	OCT 1995	ORDER LIMITATIONS (Insert "\$1,000", "\$45M", "\$45M", "30 DAYS", and "5 DAYS" in paragraphs (a), (b)(1), (b)(2), (b)(3) and (d), respectively)
52.216-22	OCT 1995	INDEFINITE QUANTITY (Insert "1 YEAR FROM THE END DATE OF THE ORDERING PERIOD OF THE CONTRACT" in paragraph (d))
52.217-8	NOV 1999	OPTION TO EXTEND SERVICES
52.217-9	MAR 2000	OPTION TO EXTEND THE TERM OF THE CONTRACT (Insert "15 days" and "30 days" in paragraph (a). Insert "5 years" in paragraph (c))
52.219-6	JUNE 2003	NOTICE OF TOTAL SMALL BUSINESS SET-ASIDE
52.219-8	MAY 2004	UTILIZATION OF SMALL BUSINESS CONCERNS
52.219-14	DEC 1996	LIMITATIONS ON SUBCONTRACTING
52.219-28	JUN 2007	POST-AWARD SMALL BUSINESS PROGRAM REREPRESENTATION
52.222-2	JUL 1990	PAYMENT FOR OVERTIME PREMIUMS (INSERT "\$ TBD" IN PARAGRAPH (a))
52.222-3	JUN 2003	CONVICT LABOR
52.222-21	FEB 1999	PROHIBITION OF SEGREGATED FACILITIES
52.222-26	MAR 2007	EQUAL OPPORTUNITY
52.222-35	SEP 2006	EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS
52.222-36	JUN 1998	AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES
52.222-37	SEP 2006	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS

52.222-50	AUG 2007	COMBATING TRAFFICKING IN PERSONS
52.223-3	JAN 1997	HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA ALTERNATE I (JUL 1995)
52.223-5	AUG 2003	POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION
52.223-6	MAY 2001	DRUG-FREE WORKPLACE
52.223-10	AUG 2000	WASTE REDUCTION PROGRAM
52.223-14	AUG 2003	TOXIC CHEMICAL RELEASE REPORTING
52.225-1	JUN 2003	BUY AMERICAN ACT - SUPPLIES
52.225-13	JUN 2008	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES
52.227-1	DEC 2007	AUTHORIZATION AND CONSENT - ALTERNATE 1 (APR 1984)
52.227-2	DEC 2007	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT
52.227-11	DEC 2007	PATENT RIGHTS-RETENTION BY THE CONTRACTOR (SHORT FORM) (AS MODIFIED BY NFS 1852.227-11)
52.227-14	DEC 2007	RIGHTS IN DATA-GENERAL ALTERNATE II (DEC 2007) ALTERNATE III (DEC 2007) AS MODIFIED BY 1852.227-14 NASA FAR SUPPLEMENT
52.227-16	JUN 1987	ADDITIONAL DATA REQUIREMENTS
52.227-17	DEC 2007	SPECIAL WORKS (AS MODIFIED BY NFS 1852.227-17 SPECIAL WORKS)
52.228-7	MAR 1996	INSURANCE - LIABILITY TO THIRD PERSONS
52.232-9	APR 1984	LIMITATION ON WITHHOLDING OF PAYMENTS
52.232-17	JUN 1996	INTEREST
52.232-18	APR 1984	AVAILABILITY OF FUNDS
52.232-20	APR 1984	LIMITATION OF COST
52.232-22	APR 1984	LIMITATION OF FUNDS
52.232-23	JAN 1986	ASSIGNMENT OF CLAIMS
52.232-25	OCT 2003	PROMPT PAYMENT
52.232-34	MAY 1999	PAYMENT BY ELECTRONIC FUNDS TRANSFER - OTHER THAN CENTRAL CONTRACTOR REGISTRATION (Insert: "submission of completed ACH form with proposal" in paragraph (b)(1))
52.233-1	JUL 2002	DISPUTES - ALTERNATE I (DEC 1991)
52.233-3	AUG 1996	PROTEST AFTER AWARD - ALTERNATE I (JUN 1985)
52.233-4	OCT 2004	APPLICABLE LAW FOR BREACH OF CONTRACT CLAIM
52.237-1	APR 1984	SITE VISIT
52.237-3	JAN 1991	CONTINUITY OF SERVICES
52.242-1	APR 1984	NOTICE OF INTENT TO DISALLOW COSTS
52.242-3	MAY 2001	PENALTIES FOR UNALLOWABLE COSTS
52.242-4	JAN 1997	CERTIFICATION OF FINAL INDIRECT COSTS
52.242-13	JUL 1995	BANKRUPTCY

52.243-2	AUG 1987	CHANGES - COST-REIMBURSEMENT - ALTERNATE II (APR 1984)
52.244-2	JUN 2007	SUBCONTRACTS (JUN 2007) - ALTERNATE I (Insert "\$1 Million" in paragraph (d) and "None" in paragraph (j))
52.244-5	DEC 1996	COMPETITION IN SUBCONTRACTING
52.244-6	MAR 2007	SUBCONTRACTS FOR COMMERCIAL ITEMS
52.245-1	JUN 2007	GOVERNMENT PROPERTY
52.246-25	FEB 1997	LIMITATION OF LIABILITY - SERVICES
52.247-1	FEB 2006	COMMERCIAL BILL OF LADING NOTATIONS
52.249-6	MAY 2004	TERMINATION (COST-REIMBURSEMENT)
52.249-14	APR 1984	EXCUSABLE DELAYS
52.251-1	APR 1984	GOVERNMENT SUPPLY SOURCES
52.253-1	JAN 1991	COMPUTER GENERATED FORMS

## II. NASA FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES

CLAUSE NUMBER	DATE	TITLE
1852.203-70	JUN 2001	DISPLAY OF INSPECTOR GENERAL HOTLINE POSTERS
1852.216-89	JUL 1997	ASSIGNMENT AND RELEASE FORMS
1852.219-74	SEP 1990	USE OF RURAL AREA SMALL BUSINESSES
1852.219-76	JUL 1997	NASA 8 PERCENT GOAL
1852.223-74	MAR 1996	DRUG- AND ALCOHOL-FREE WORKFORCE
1852.228-75	OCT 1988	MINIMUM INSURANCE COVERAGE
1852.235-70	DEC 2006	CENTER FOR AEROSPACE INFORMATION
1852.237-70	DEC 1988	EMERGENCY EVACUATION PROCEDURES
1852.237-72	JUN 2005	ACCESS TO SENSITIVE INFORMATION
1852.237-73	JUN 2005	RELEASE OF SENSITIVE INFORMATION
1852.242-78	APR 2001	EMERGENCY MEDICAL SERVICES AND EVACUATION
1852.243-71	MAR 1997	SHARED SAVINGS

### I.3 PERSONAL IDENTITY VERIFICATION OF CONTRACTOR PERSONNEL (FAR 52.204-9) (SEP 2007)

(a) The Contractor shall comply with agency personal identity verification procedures identified in the contract that implement Homeland Security Presidential Directive-12 (HSPD-12), Office of Management and Budget (OMB) guidance M-05-24 and Federal Information Processing Standards Publication (FIPS PUB) Number 201.

(b) The Contractor shall insert this clause in all subcontracts when the subcontractor is required to have routine physical access to a Federally-controlled facility and/or routine access to a Federally-controlled information system.

FIPS 201 graphically displays the following procedure for the issuance of a PIV credential.

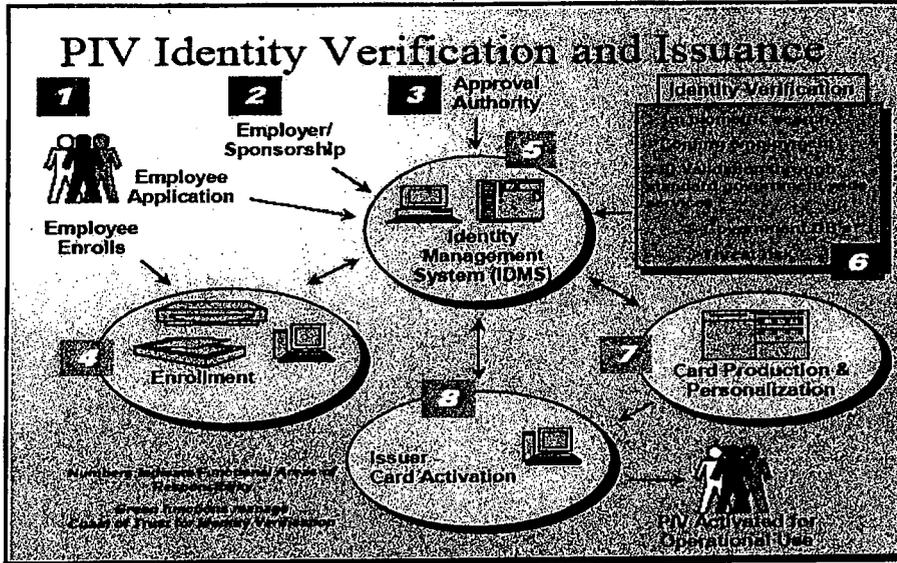


Figure A-1, FIPS 201, Appendix A

The following steps describe the procedures for the NASA Personal Identity Verification Card Issuance (PCI) of a PIV credential:

**Step 1:**

The Contractor's Corporate Security Officer (CSO), Program Manager (PM), or Facility Security Officer (FSO) submits a formal letter that provides a list of contract employees (applicant) names requesting access to the NASA Contracting Officer's Technical Representative (COTR). In the case of a foreign national applicant, approval through the NASA Foreign National Management System (NFMMS) must be obtained for the visit or assignment before any processing for a PIV credential can take place. Further, if the foreign national is not under a contract where a COTR has been officially designated, the foreign national will provide the information directly to their visit/assignment host, and the host sponsor will fulfill the duties of the COTR mentioned herein. In each case, the letter shall provide notification of the contract or foreign national employee's (hereafter the "applicant") full name (first, middle and last), social security number (SSN) or NASA Foreign National Management System Visitor Number if the foreign national does not have a SSN, and date of birth. If the contract employee has a current satisfactorily completed National Agency Check with Inquiries (NACI) or an equivalent or higher degree of background investigation, the letter shall indicate the type of investigation, the agency completing the investigation, and date the investigation was completed. Also, the letter must specify the risk/sensitivity level associated with the position in which each applicant will be working (NPR 1600.1, §4.5 is germane) Further, the letter shall also acknowledge that contract employees may be denied access to NASA information or information systems based on an unsatisfactory background investigation/adjudication.

After reviewing the letter for completeness and concurring with the risk/sensitivity levels, the COTR/host must forward the letter to the Center Chief of Security (CCS). The CCS shall review the OPM databases (e.g., DCII, PIP, et al.), and take appropriate steps to validate the applicant's investigation status. Requirements for a NACI or other investigation shall be initiated only if necessary.

Applicants who do not currently possess the required level of background investigation shall be directed to the e-QIP web site to complete the necessary background investigation forms online. The CCS shall provide to the COTR/host information and instructions on how to access the e-QIP for each contract or foreign national employee requiring access

**Step 2:**

Upon acceptance of the letter/background information, the applicant will be advised that in order to complete the investigative process, he or she must appear in-person before the authorized PIV registrar and submit two forms of identity source documents in original form. The identity source documents must come from the list of acceptable documents included in Form I-9, Employment Eligibility Verification, one which must be a Federal<sup>1</sup> or State issued picture identification. Fingerprints will be taken at this time. The applicant must appear **no later than** the entry on duty date.

When the applicant appears, the registrar will electronically scan the submitted documents; any document that appears invalid will be rejected by the registrar. The registrar will capture electronically both a facial image and fingerprints of the applicant. The information submitted by the applicant will be used to create or update the applicant identity record in the Identity Management System (IDMS).

**Step 3:**

Upon the applicant's completion of the investigative document, the CCS reviews the information, and resolves discrepancies with the applicant as necessary. When the applicant has appeared in person and completed fingerprints, the package is electronically submitted to initiate the NACI. The CCS includes a request for feedback on the NAC portion of the NACI at the time the request is submitted.

**Step 4:**

Prior to authorizing physical access of a contractor employee to a federally-controlled facility or access to a Federal information system, the CCS will ensure that a check has been performed with the National Crime Information Center (NCIC) and Interstate Identification Index. In the case of a foreign national, a national check of the Bureau of Immigration and Customs Enforcement (BICE) database will be performed for each applicant. If this process yields negative information, the CCS will immediately notify the COTR/host of the determination regarding access made by the CCS.

**Step 5:**

Upon receipt of the completed NAC, the CCS will update IDMS from the NAC portion of the NACI and indicate the result of the suitability determination. If an unsatisfactory suitability determination is rendered, the COTR will advise the contractor that the employee is being denied physical access to all federally-controlled facilities and Federal information systems.

Based on a favorable NAC and NCIC/III or BICE check, the CCS will authorize the issuance of a PIV federal credential in the Physical Access Control System (PACS) database. The CCS, based on information provided by the COTR/host, will determine what physical access the applicant should be granted once the PIV issues the credential.

**Step 6:**

Using the information provided by the applicant during his or her in-person appearance, the PIV card production facility creates and instantiates the approved PIV card for the applicant with an activation date commensurate with the applicant's start date.

**Step 7:**

The applicant proceeds to the credential issuance facility to begin processing for receipt of his/her federal credential.

The applicant provides to the credential issuing operator proof of identity with documentation that meets the requirements of FIPS 201 (DHS Employment Eligibility Verification (Form I-9) documents. These documents **must** be the same documents submitted for registration.

<sup>1</sup> A non-PIV government identification badge, including the NASA Photo Identification Badge, **MAY NOT BE USED** for the original issuance of a PIV vetted credential

The credential issuing operator will verify that the facial image, and optionally reference finger print, matches the enrollment data used to produce the card. Upon verification of identity, the operator will locate the employee's record in the PACS database, and modify the record to indicate the PIV card has been issued. The applicant will select a PIN for use with his or her new PIV card. Although root data is inaccessible to the operator, certain fields (hair color, eye color, et al.) may be modified to more accurately record the employee's information.

The applicant proceeds to a kiosk or other workstation to complete activation of the PIV card using the initial PIN entered at card issuance.

**ALTERNATIVE FOR APPLICANTS WHO DO NOT HAVE A COMPLETED AND ADJUDICATED NAC AT THE TIME OF ENTRANCE ON DUTY**

Steps 1 through 4 shall be accomplished for all applicants in accordance with the process described above. If the applicant is unable to appear in person until the time of entry on duty, or does not, for any other reason, have a completed and adjudicated NAC portion of the NACI at the time of entrance on duty, the following interim procedures shall apply.

1. If the documents required to submit the NACI have not been completed prior to EOD, the applicant will be instructed to complete all remaining requirements for submission of the investigation request. This includes presentation of I-9 documents and completion of fingerprints, if not already accomplished. If the applicant fails to complete these activities as prescribed in NPR 1600.1 (Chapters 3 & 4), it may be considered as failure to meet the conditions required for physical access to a federally-controlled facility or access to a Federal information system, and result in denial of such access.
2. Based on favorable results of the NCIC, the applicant shall be issued a temporary NASA identification card for a period not-to-exceed six months. If at the end of the six month period the NAC results have not been returned, the agency will at that time make a determination if an additional extension will be granted for the temporary identification card.
3. Upon return of the completed NAC, the process will continue from Step 5.

(END OF CLAUSE)

**I.4 NOTIFICATION OF EMPLOYEE RIGHTS CONCERNING PAYMENT OF UNION DUES OR FEES. (FAR 52.222-39) (DEC 2004)**

(a) *Definition.* As used in this clause

"United States" means the 50 States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, American Samoa, Guam, the U.S. Virgin Islands, and Wake Island.

(b) Except as provided in paragraph (e) of this clause, during the term of this contract, the Contractor shall post a notice, in the form of a poster, informing employees of their rights concerning union membership and payment of union dues and fees, in conspicuous places in and about all its plants and offices, including all places where notices to employees are customarily posted. The notice shall include the following information (except that the information pertaining to National Labor Relations Board shall not be included in notices posted in the plants or offices of carriers subject to the Railway Labor Act, as amended (45 U.S.C. 151-188)).

**Notice to Employees**

Under Federal law, employees cannot be required to join a union or maintain membership in a union in order to retain their jobs. Under certain conditions, the law permits a union and an employer to enter into a union-security agreement requiring employees to pay uniform periodic dues and initiation fees. However, employees who are not union members can object to the use of their payments for

certain purposes and can only be required to pay their share of union costs relating to collective bargaining, contract administration, and grievance adjustment.

If you do not want to pay that portion of dues or fees used to support activities not related to collective bargaining, contract administration, or grievance adjustment, you are entitled to an appropriate reduction in your payment. If you believe that you have been required to pay dues or fees used in part to support activities not related to collective bargaining, contract administration, or grievance adjustment, you may be entitled to a refund and to an appropriate reduction in future payments.

For further information concerning your rights, you may wish to contact the National Labor Relations Board (NLRB) either at one of its Regional offices or at the following address or toll free number:

National Labor Relations Board  
 Division of Information  
 1099 14th Street, N.W.  
 Washington, DC 20570  
 1-866-667-6572  
 1-866-316-6572 (TTY)

To locate the nearest NLRB office, see NLRB's website at <http://www.nlr.gov>.

(c) The Contractor shall comply with all provisions of Executive Order 13201 of February 17, 2001, and related implementing regulations at 29 CFR Part 470, and orders of the Secretary of Labor.

(d) In the event that the Contractor does not comply with any of the requirements set forth in paragraphs (b), (c), or (g), the Secretary may direct that this contract be cancelled, terminated, or suspended in whole or in part, and declare the Contractor ineligible for further Government contracts in accordance with procedures at 29 CFR Part 470, Subpart B - Compliance Evaluations, Complaint Investigations and Enforcement Procedures. Such other sanctions or remedies may be imposed as are provided by 29 CFR Part 470, which implements Executive Order 13201, or as are otherwise provided by law.

(e) The requirement to post the employee notice in paragraph (b) does not apply to:

- (1) Contractors and subcontractors that employ fewer than 15 persons;
- (2) Contractor establishments or construction work sites where no union has been formally recognized by the Contractor or certified as the exclusive bargaining representative of the Contractor's employees;
- (3) Contractor establishments or construction work sites located in a jurisdiction named in the definition of the United States in which the law of that jurisdiction forbids enforcement of union-security agreements;
- (4) Contractor facilities where upon the written request of the Contractor, the Department of Labor Deputy Assistant Secretary for Labor-Management Programs has waived the posting requirements with respect to any of the Contractor's facilities if the Deputy Assistant Secretary finds that the Contractor has demonstrated that:

(i) The facility is in all respects separate and distinct from activities of the Contractor related to the performance of a contract; and

(ii) Such a waiver will not interfere with or impede the effectuation of the Executive order; or

(5) Work outside the United States that does not involve the recruitment or employment of workers within the United States.

(f) The Department of Labor publishes the official employee notice in two variations; one for contractors covered by the Railway Labor Act and a second for all other contractors. The Contractor shall:

- (1) Obtain the required employee notice poster from the Division of Interpretations and Standards, Office of Labor-Management Standards, U.S. Department of Labor, 200 Constitution

Avenue, NW, Room N-5605, Washington, DC 20210, or from any field office of the Department's Office of Labor-Management Standards or Office of Federal Contract Compliance Programs;

(2) Download a copy of the poster from the Office of Labor-Management Standards website at <http://www.olms.dol.gov>; or

(3) Reproduce and use exact duplicate copies of the Department of Labor's official poster.

(g) The Contractor shall include the substance of this clause in every subcontract or purchase order that exceeds the simplified acquisition threshold, entered into in connection with this contract, unless exempted by the Department of Labor Deputy Assistant Secretary for Labor-Management Programs on account of special circumstances in the national interest under authority of 29 CFR 470.3(c). For indefinite quantity subcontracts, the Contractor shall include the substance of this clause if the value of orders in any calendar year of the subcontract is expected to exceed the simplified acquisition threshold. Pursuant to 29 CFR Part 470, Subpart B - Compliance Evaluations, Complaint Investigations and Enforcement Procedures, the Secretary of Labor may direct the Contractor to take such action in the enforcement of these regulations, including the imposition of sanctions for noncompliance with respect to any such subcontract or purchase order. If the Contractor becomes involved in litigation with a subcontractor or vendor, or is threatened with such involvement, as a result of such direction, the Contractor may request the United States, through the Secretary of Labor, to enter into such litigation to protect the interests of the United States.

(END OF CLAUSE)

#### **I.5 RIGHTS TO PROPOSAL DATA (TECHNICAL). (FAR 52.227-23) (JUNE 1987)**

Except for data contained on pages none, it is agreed that as a condition of award of this contract, and notwithstanding the conditions of any notice appearing thereon, the Government shall have unlimited rights (as defined in the "Rights in Data—General" clause contained in this contract) in and to the technical data contained in the proposal dated Jan. 6, 2010, upon which this contract is based.

(END OF CLAUSE)

#### **I.6 OMBUDSMAN. (NFS 1852.215-84) (OCT 2003)**

(a) An ombudsman has been appointed to hear and facilitate the resolution of concerns from offerors, potential offerors, and contractors during the preaward and postaward phases of this acquisition. When requested, the ombudsman will maintain strict confidentiality as to the source of the concern. The existence of the ombudsman is not to diminish the authority of the contracting officer, the Source Evaluation Committee (SEC), or the selection official. Further, the ombudsman does not participate in the evaluation of proposals, the source selection process, or the adjudication of formal contract disputes. Therefore, before consulting with an ombudsman, interested parties must first address their concerns, issues, disagreements, and/or recommendations to the contracting officer for resolution.

(b) If resolution cannot be made by the contracting officer, interested parties may contact the installation ombudsman,

NASA-Ames Research Center  
 Lewis S. Braxton, III, M/S 200-9  
 Bldg. 200, Room 207  
 P.O. Box 1  
 Moffett Field, CA 94035-0001  
 Telephone: (650) 604-5068  
 Facsimile: (650) 604-0031 or (650) 604-1668  
 Email: [Lewis.S.Braxton@nasa.gov](mailto:Lewis.S.Braxton@nasa.gov)

Concerns, issues, disagreements, and recommendations which cannot be resolved at the installation may be referred to the NASA ombudsman, the Director of the Contract Management Division, at 202-358-0445, facsimile 202-358-3083, e-mail james.a.balinskas@nasa.gov. Please do not contact the ombudsman to request copies of the solicitation, verify offer due date, or clarify technical requirements. Such inquiries shall be directed to the Contracting Officer or as specified elsewhere in this document.

(END OF CLAUSE)

**I.7 SECURITY REQUIREMENTS FOR UNCLASSIFIED INFORMATION TECHNOLOGY RESOURCES. (NFS 1852.204-76) (MAY 2008) (DEVIATION)**

(a) The Contractor shall be responsible for information and information technology (IT) security when –

(1) The Contractor or its subcontractors must obtain physical or electronic (i.e., authentication level 2 and above as defined in National Institute of Standards and Technology (NIST) Special Publication (SP) 800-63, Electronic Authentication Guideline) access to NASA's computer systems, networks, or IT infrastructure; or

(2) Information categorized as low, moderate, or high by the Federal Information Processing Standards (FIPS) 199, Standards for Security Categorization of Federal Information and Information Systems is stored, generated, processed, or exchanged by NASA or on behalf of NASA by a contractor or subcontractor, regardless of whether the information resides on a NASA or a contractor/subcontractor's information system.

(b) IT Security Requirements.

(1) Within 30 days after contract award, a Contractor shall submit to the Contracting Officer for NASA approval an IT Security Plan, Risk Assessment, and FIPS 199, Standards for Security Categorization of Federal Information and Information Systems, Assessment. These plans and assessments, including annual updates shall be incorporated into the contract as compliance documents.

(i) The IT system security plan shall be prepared consistent, in form and content, with NIST SP 800-18, Guide for Developing Security Plans for Federal Information Systems, and any additions/augmentations described in NASA Procedural Requirements (NPR) 2810, Security of Information Technology. The security plan shall identify and document appropriate IT security controls consistent with the sensitivity of the information and the requirements of Federal Information Processing Standards (FIPS) 200, Recommended Security Controls for Federal Information Systems. The plan shall be reviewed and updated in accordance with NIST SP 800-26, Security Self-Assessment Guide for Information Technology Systems, and FIPS 200, on a yearly basis.

(ii) The risk assessment shall be prepared consistent, in form and content, with NIST SP 800-30, Risk Management Guide for Information Technology Systems, and any additions/augmentations described in NPR 2810. The risk assessment shall be updated on a yearly basis.

(iii) The FIPS 199 assessment shall identify all information types as well as the "high water mark," as defined in FIPS 199, of the processed, stored, or transmitted information necessary to fulfill the contractual requirements.

(2) The Contractor shall produce contingency plans consistent, in form and content, with NIST SP 800-34, Contingency Planning Guide for Information Technology Systems, and any additions/augmentations described in NPR 2810. The Contractor shall perform yearly "Classroom Exercises." "Functional Exercises," shall be coordinated with the Center CIOs and be conducted once every three years, with the first conducted within the first two years of contract award. These exercises are defined and described in NIST SP 800-34.

(3) The Contractor shall ensure coordination of its incident response team with the NASA Incident Response Center (NASIRC) and the NASA Security Operations Center, ensuring that incidents are reported consistent with NIST SP 800-61, Computer Security Incident Reporting Guide, and the United States Computer Emergency Readiness Team's (US-CERT) Concept of Operations for reporting security incidents. Specifically, any confirmed incident of a system containing NASA data or controlling NASA assets shall be reported to NASIRC within one hour that results in

unauthorized access, loss or modification of NASA data, or denial of service affecting the availability of NASA data.

(4) The Contractor shall ensure that its employees, in performance of the contract, receive annual IT security training in NASA IT Security policies, procedures, computer ethics, and best practices in accordance with NPR 2810 requirements. The Contractor may use web-based training available from NASA to meet this requirement.

(5) The Contractor shall provide NASA, including the NASA Office of Inspector General, access to the Contractor's and subcontractors' facilities, installations, operations, documentation, databases, and personnel used in performance of the contract. Access shall be provided to the extent required to carry out IT security inspection, investigation, and/or audits to safeguard against threats and hazards to the integrity, availability, and confidentiality of NASA information or to the function of computer systems operated on behalf of NASA, and to preserve evidence of computer crime. To facilitate mandatory reviews, the Contractor shall ensure appropriate compartmentalization of NASA information, stored and/or processed, either by information systems in direct support of the contract or that are incidental to the contract.

(6) The Contractor shall ensure that system administrators who perform tasks that have a material impact on IT security and operations demonstrate knowledge appropriate to those tasks. A system administrator is one who provides IT services (including network services, file storage, and/or web services) to someone other than themselves and takes or assumes the responsibility for the security and administrative controls of that service.

(7) The Contractor shall ensure that NASA's Sensitive But Unclassified (SBU) information as defined in NPR 1600.1, NASA Security Program Procedural Requirements, which includes privacy information, is encrypted in storage and transmission.

(8) When the Contractor is located at a NASA Center or installation or is using NASA IP address space, the Contractor shall --

(i) Submit requests for non-NASA provided external Internet connections to the Contracting Officer for approval by the Network Security Configuration Control Board (NSCCB);

(ii) Comply with the NASA CIO metrics including patch management, operating systems and application configuration guidelines, vulnerability scanning, incident reporting, system administrator certification, and security training; and

(iii) Utilize the NASA Public Key Infrastructure (PKI) for all encrypted communication or non-repudiation requirements within NASA when secure email capability is required.

(c) Physical and Logical Access Requirements.

(1) Contractor personnel requiring access to IT systems operated by the Contractor for NASA or interconnected to a NASA network shall be screened at an appropriate level in accordance with NPR 2810 and Chapter 4, NPR 1600.1, NASA Security Program Procedural Requirements. NASA shall provide screening, appropriate to the highest risk level, of the IT systems and information accessed, using, as a minimum, National Agency Check with Inquiries (NACI). The Contractor shall submit the required forms to the NASA Center Chief of Security (CCS) within fourteen (14) days after contract award or assignment of an individual to a position requiring screening. The forms may be obtained from the CCS. At the option of NASA, interim access may be granted pending completion of the required investigation and final access determination. For Contractors who will reside on a NASA Center or installation, the security screening required for all required access (e.g., installation, facility, IT, information, etc.) is consolidated to ensure only one investigation is conducted based on the highest risk level. Contractors not residing on a NASA installation will be screened based on their IT access risk level determination only. See NPR 1600.1, Chapter 4.

(2) Guidance for selecting the appropriate level of screening is based on the risk of adverse impact to NASA missions. NASA defines three levels of risk for which screening is required (IT-1 has the highest level of risk).

(i) IT-1 -- Individuals having privileged access or limited privileged access to systems whose misuse can cause very serious adverse impact to NASA missions. These systems include, for example, those that can transmit commands directly modifying the behavior of spacecraft, satellites or aircraft.

(ii) IT-2 -- Individuals having privileged access or limited privileged access to systems whose misuse can cause serious adverse impact to NASA missions. These systems include, for example, those that can transmit commands directly modifying the behavior of payloads on spacecraft.

satellites or aircraft; and those that contain the primary copy of "level 1" information whose cost to replace exceeds one million dollars.

(iii) IT-3 -- Individuals having privileged access or limited privileged access to systems whose misuse can cause significant adverse impact to NASA missions. These systems include, for example, those that interconnect with a NASA network in a way that exceeds access by the general public, such as bypassing firewalls; and systems operated by the Contractor for NASA whose function or information has substantial cost to replace, even if these systems are not interconnected with a NASA network.

(3) Screening for individuals shall employ forms appropriate for the level of risk as established in Chapter 4, NPR 1600.1.

(4) The Contractor may conduct its own screening of individuals requiring privileged access or limited privileged access provided the Contractor can demonstrate to the Contracting Officer that the procedures used by the Contractor are equivalent to NASA's personnel screening procedures for the risk level assigned for the IT position.

(5) Subject to approval of the Contracting Officer, the Contractor may forgo screening of Contractor personnel for those individuals who have proof of a --

(i) Current or recent national security clearances (within last three years);

(ii) Screening conducted by NASA within the last three years that meets or exceeds the screening requirements of the IT position; or

(iii) Screening conducted by the Contractor, within the last three years, that is equivalent to the NASA personnel screening procedures as approved by the Contracting Officer and concurred on by the CCS.

(d) The Contracting Officer may waive the requirements of paragraphs (b) and (c)(1) through (c)(3) upon request of the Contractor. The Contractor shall provide all relevant information requested by the Contracting Officer to support the waiver request.

(e) The Contractor shall contact the Contracting Officer for any documents, information, or forms necessary to comply with the requirements of this clause.

(f) At the completion of the contract, the contractor shall return all NASA information and IT resources provided to the contractor during the performance of the contract and certify that all NASA information has been purged from contractor-owned systems used in the performance of the contract.

(g) The Contractor shall insert this clause, including this paragraph (g), in all subcontracts

(1) Have physical or electronic access to NASA's computer systems, networks, or IT infrastructure; or

(2) Use information systems to generate, store, process, or exchange data with NASA or on behalf of NASA, regardless of whether the data resides on a NASA or a contractor's information system.

(END OF CLAUSE)

#### **I.8. AUTHORIZED DEVIATIONS IN CLAUSES (FAR 52.252-6)(APR 1984)**

(a) The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the clause.

(b) The use in this solicitation or contract of any NASA FAR Supplement (48 CFR CHAPTER 18) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(END OF CLAUSE)

[END OF SECTION]

PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

SECTION J – LIST OF ATTACHMENTS

**J.1 LIST OF DOCUMENTS, EXHIBITS, AND ATTACHMENTS**

(a) The following documents, exhibits, and attachments are included in the solicitation and resulting contract. Representations and certifications completed by the contractor in response to this solicitation are incorporated by reference in the resulting contract at time of award.

<u>Attachment No./Title</u>	<u>Date</u>	<u># Pages</u>
1. Statement of Work	8/20/08	8
2. Contract Data Requirements List	8/20/08	12
3. Space Technology Division Government Supplied Equipment List	9/26/08	3
4. Contractor's Health and Safety Plan	1/6/10	39
5. Direct Labor Rates, Fringe Rates, Indirect Rates, Fixed Fee, and Ceiling Rate Matrices	1/6/10	71
6. Contractor's IT Security Plan	*	*
7. Organizational Conflicts of Interest Avoidance Plan	1/6/10	8

\* Date to be completed at time of award or by subsequent modification.

(END OF CLAUSE)

[END OF SECTION]

14. DESCRIPTION OF AMENDMENT/MODIFICATION cont.

- 1) This Modification is to obligate funds to the contract in the amount of [REDACTED] using multiple Purchase Requests (PRs). The PR numbers and respective amounts are 4200366263 [REDACTED], 4200367969 [REDACTED], 4200359235 [REDACTED], 4200359291 [REDACTED]. Therefore, Section B, paragraph B.7, NFS 1852.232-81 CONTRACT FUNDING (JUN 1990), is deleted entirely and replaced by the following:

] B4

B.3. CONTRACT FUNDING (NFS 1852.232-81) (JUNE 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 contract is \$4,955,334.47. This allotment is for the line items 01A and 01B and covers the following estimated period of performance: date of award through March 31, 2011.

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

B4

SUMMARY OF CONTRACT FUNDING	FROM	BY	TO
Cost	\$4,385,705.26	\$569,629.21	\$4,955,334.47
Fixed Fee	[REDACTED]	[REDACTED]	[REDACTED]
Total Cost Plus Fixed Fee	[REDACTED]	[REDACTED]	[REDACTED]

] B4

(END OF CLAUSE)

- 2) All other terms and conditions remain the same.

End of Modification No. 07

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT I D CODE		PAGE OF PAGES	
				1	2
2. AMENDMENT/MOD NO. Mod 6		3. EFFECTIVE DATE See Block 16C		4. REQUISITION/PURCHASE REQ. NO. 4200364205	
NASA Ames Research Center ATTN: Zachary Burkland Mailstop 241-1 Moffett Field, CA 94035-0001		7. ADMINISTERED BY		5. PROJECT NO	
8. NAME AND ADDRESS OF CONTRACTOR (No. Street, County, State and ZIP Code) ERC, Inc. 4901 Corporate Drive, Suite E Huntsville, AL 35805		(9)		9A. AMENDMENT OF SOLICITATION NO	
CODE		FACILITY CODE		9B. DATED (SEE ITEM 11)	
		(10)		10A. MOD. OF CONTRACT/ORDER No NNA10DE12C	
		<input checked="" type="checkbox"/>		10B. DATED (SEE ITEM 13) 4/1/10	
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 OR 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:					
<p>(a) By completing Items 8 and 15, and returning one (1) copy of the amendment;</p> <p>(b) By acknowledging receipt of this amendment on each copy of the offer submitted; or</p> <p>(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.</p>					
12. ACCOUNTING AND APPROPRIATION DATA (if required)					
(PR:4200364205 Obligate ██████████ PPC:BX B-4 Financial Management					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
<input type="checkbox"/> 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.					
<input type="checkbox"/> 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).					
<input type="checkbox"/> C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:					
<input checked="" type="checkbox"/> D. OTHER (Specify type of modification and authority) Section I, FAR 52.232-22, Limitation of Funds (MAR 1989) (Unilateral)					
IMPORTANT: Contractor IS NOT 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 the modification is to obligate ██████████ to the contract. See Page 2 B-4					
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		
			Brenda Pohl - Contracting Officer		
15B. CONTRACTOR/OFFEROR		16B. UNITED STATES OF AMERICA		16C. DATE SIGNED	
(Electronic Signature Applied)		BRENDA POHL (12/1/2010)		(Electronic Signature Applied)	
NSN 7540-01-152-8070 PREVIOUS EDITION UNUSABLE		30-105		STANDARD FORM 30 (REV. 10-83) ES Prescribed by GSA FPMR (48 CFR)	

14. DESCRIPTION OF AMENDMENT/MODIFICATION cont.

B-4

1) This Modification is to obligate funds to the contract in the amount of [REDACTED] using PR 4200384205. Therefore, Section B, paragraph B.7, NFS 1852.232-81 CONTRACT FUNDING (JUN 1990), is deleted entirely and replaced by the following:

B.3. CONTRACT FUNDING (NFS 1852.232-81) (JUNE 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 contract is \$4,385,705.26. This allotment is for the line items 01A and 01B and covers the following estimated period of performance: date of award through March 31, 2011.

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

B-4

SUMMARY OF CONTRACT FUNDING	FROM	BY	TO
Cost	\$3,953,192.20	\$432,513.06	\$4,385,705.26
Fixed Fee	[REDACTED]	[REDACTED]	[REDACTED]
Total Cost Plus Fixed Fee	[REDACTED]	[REDACTED]	[REDACTED]

] B-4

(END OF CLAUSE)

2) All other terms and conditions remain the same.

End of Modification No. 06

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE		PAGE OF PAGES	
					1	2
2. AMENDMENT/MOD NO. Mod 5		3. EFFECTIVE DATE See Block 16C		4. REQUISITION/PURCHASE REQ. NO. 4200358651, 4200359698		5. PROJECT NO
NASA Ames Research Center ATTN: Zachary Burkland Mailstop 241-1 Moffett Field, CA 94035-0001			7. ADMINISTERED BY		CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No. Street, County, State and ZIP Code) ERC, Inc. 4901 Corporate Drive, Suite E Huntsville, AL 35805				(9)	9A. AMENDMENT OF SOLICITATION NO	
				<input type="checkbox"/>	9B. DATED (SEE ITEM 11)	
				(10)	10A. MOD. OF CONTRACT/ORDER No NNA10DE12C	
CODE		FACILITY CODE		<input checked="" type="checkbox"/>	10B. DATED (SEE ITEM 13) 4/1/10	
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 OR 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:4200359698 Obligate [REDACTED] (PR:4200358651 <i>BA</i> Financial Management						
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.						
<input type="checkbox"/> 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.						
<input type="checkbox"/> 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).						
<input type="checkbox"/> C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:						
<input checked="" type="checkbox"/> D. OTHER (Specify type of modification and authority) Section I, FAR 52.232-22, Limitation of Funds (MAR 1989) (Unilateral)						
IMPORTANT: Contractor IS NOT 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 the modification is to obligate [REDACTED] <i>BA</i> to the contract and deobligate [REDACTED] from the contract for a net increase in funding of [REDACTED] <i>BA</i> See 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.						
5A. NAME AND TITLE OF SIGNER (Type or print)			16A. NAME AND TITLE OF CONTRACTING OFFICER Natalie LeMar - Contracting Officer			
15B. CONTRACTOR/OFFEROR  (Electronic Signature Applied)				16B. UNITED STATES OF AMERICA NATALIE LEMAR (10/27/2010) (Electronic Signature Applied)		16C. DATE SIGNED

14. DESCRIPTION OF AMENDMENT/MODIFICATION cont.

- 1) This Modification is to obligate funds to the contract in the amount of [REDACTED] using PR4200359698, and to deobligate funds from the contract in the amount of [REDACTED] using PR4200358651. This will result in a net increase in funding of [REDACTED]. Therefore, Section B, paragraph B.7, NFS 1852.232-81 CONTRACT FUNDING (JUN 1990), is deleted entirely and replaced by the following:

B4

B.3. CONTRACT FUNDING (NFS 1852.232-81) (JUNE 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 contract is \$3,953,192.20. This allotment is for the line items 01A and 01B and covers the following estimated period of performance: date of award through March 22, 2011.

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

B4

SUMMARY OF CONTRACT FUNDING	FROM	BY	TO
Cost	\$3,544,108.20	\$409,084.00	\$3,953,192.20
Fixed Fee	[REDACTED]	[REDACTED]	[REDACTED]
Total Cost Plus Fixed Fee	[REDACTED]	[REDACTED]	[REDACTED]

B4

(END OF CLAUSE)

- 2) All other terms and conditions remain the same.

End of Modification No. 05

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES	
				1	2
2. AMENDMENT/MOD NO. 4	3. EFFECTIVE DATE See Block 16C	4. REQUISITION/PURCHASE REQ. NO. 4200355743, 4200358651, 4200357630		5. PROJECT NO.	
NASA Ames Research Center ATTN: Zachary Burkland Mailstop 241-1 Moffett Field, CA 94035-0001		7. ADMINISTERED BY	CODE		
8. NAME AND ADDRESS OF CONTRACTOR (No. Street, County, State and ZIP Code) ERC, Inc. 4901 Corporate Drive, Suite E Huntsville, AL 35805			(9)	9A. AMENDMENT OF SOLICITATION NO.	
			<input type="checkbox"/>	9B. DATED (SEE ITEM 11)	
			(10)	10A. MOD. OF CONTRACT/ORDER No NNA10DE12C	
CODE	FACILITY CODE		<input checked="" type="checkbox"/>	10B. DATED (SEE ITEM 13) 4/1/10	
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 OR 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:					
<p>(a) By completing Items 8 and 15, and returning one (1) copy of the amendment;</p> <p>(b) By acknowledging receipt of this amendment on each copy of the offer submitted; or</p> <p>(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.</p>					
12. ACCOUNTING AND APPROPRIATION DATA (if required) PR:4200355743,4200358651,4200357630 Obligate <span style="background-color: black; color: black;">[REDACTED]</span> <i>BA</i> Financial Management					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
<input type="checkbox"/> 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.					
<input type="checkbox"/> 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).					
<input type="checkbox"/> C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:					
<input checked="" type="checkbox"/> D. OTHER (Specify type of modification and authority) Section I, FAR 52.232-22, Limitation of Funds (MAR 1989) (Unilateral)					
IMPORTANT: Contractor IS NOT 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 the modification is to obligate <span style="background-color: black; color: black;">[REDACTED]</span> <i>BA</i> to the contract.  See 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)			16A. NAME AND TITLE OF CONTRACTING OFFICER Natalie LeMar - Contracting Officer		
15B. CONTRACTOR/OFFEROR  (Electronic Signature Applied)		16B. UNITED STATES OF AMERICA NATALIE LEMAR (9/24/2010) (Electronic Signature Applied)		16C. DATE SIGNED	
NSN 7540-01-152-8070 PREVIOUS EDITION UNUSABLE			30-105		STANDARD FORM 30 (REV. 10-83) ES Prescribed by GSA FPMR (48 CFR)

14. DESCRIPTION OF AMENDMENT/MODIFICATION cont.

1) This Modification is to obligate funding in the amount of [REDACTED] to the contract. Therefore, Section B, paragraph B.7, NFS 1852.232-81. CONTRACT FUNDING (JUN 1990), is deleted entirely and replaced by the following:

B-4

B.3. CONTRACT FUNDING (NFS 1852.232-81) (JUNE 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 contract is \$3,544,108.20. This allotment is for the line items 01A and 01B and covers the following estimated period of performance: date of award through March 1, 2011.

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

B-4

SUMMARY OF CONTRACT FUNDING	FROM	BY	TO
Cost	\$1,727,853.20	1,816,255.00	\$3,544,108.20
Fixed Fee	[REDACTED]	[REDACTED]	[REDACTED]
Total Cost Plus Fixed Fee	[REDACTED]	[REDACTED]	[REDACTED]

] B-4

(END OF CLAUSE)

2). All other terms and conditions remain the same.

End of Modification No. 04

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE		PAGE OF PAGES	
				1	2
2. AMENDMENT/MOD NO. Mod No. 3		3. EFFECTIVE DATE See Block 16C		4. REQUISITION/PURCHASE REQ. NO. Not applicable	
6. ISSUED BY NASA Ames Research Center Mailstop 241-1 Moffett Field, CA 94035-1000		CODE JAC: 241-1		7. ADMINISTERED BY CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No. Street, County, State and ZIP Code) ERC, Inc. 4901 Corporate Drive, Suite E Huntsville, AL 35805		(9)		9A. AMENDMENT OF SOLICITATION NO	
		<input type="checkbox"/>		9B. DATED (SEE ITEM 11)	
		(10)		10A. MOD. OF CONTRACT/ORDER No NNA10DE12C	
CODE		FACILITY CODE		<input checked="" type="checkbox"/> 10B. DATED (SEE ITEM 13) 4/1/10	
<b>11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS</b>					
The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers (IS OR 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) Not applicable PPC: KX					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
<input type="checkbox"/> 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.					
<input type="checkbox"/> 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).					
<input type="checkbox"/> C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:					
<input checked="" type="checkbox"/> D. OTHER (Specify type of modification and authority) Section I, FAR 52.243-2, Changes - Cost Reimbursement (Bilateral)					
IMPORTANT: Contractor IS NOT required to sign this document and return original 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 incorporate Ames Research Center (ARC) clause 52.237-91.  See 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) LAWRENCE U. MATSON V SITE MANAGER			16A. NAME AND TITLE OF CONTRACTING OFFICER NATALIE LEMAR		
15B. CONTRACTOR/OFFEROR Lawrence U. Matson (Signature of person authorized to sign)		15C. DATE SIGNED 9/19/2010		16B. UNITED STATES OF AMERICA (Signature Of Contracting Officer)	
				16C. DATE SIGNED	

**14. DESCRIPTION OF AMENDMENT/MODIFICATION cont.**

- 1) The purpose of this modification is to incorporate a required ARC clause into Section H of the contract . Therefore, the following clause is added:

**H.16. NON-PERSONAL SERVICES (ARC 52.237-91)**

(a) As stated in the Office of Federal Procurement Policy Letter 92-1, dated September 23, 1992, Inherently Governmental Functions, no personal services shall be performed under this contract. No Contractor employee will be directly supervised by the Government. All individual employee assignments, and daily work direction, shall be given by the applicable employee supervisor. If the Contractor believes any Government action or communication has been given that would create a personal services relationship between the Government and any Contractor employee, the Contractor shall promptly notify the Contracting Officer of this communication or action.

(b) The Contractor shall not perform any inherently governmental actions under this contract. No Contractor employee shall hold him or herself out to be a Government employee, agent, or representative. No Contractor employee shall state orally or in writing at any time that he or she is acting on behalf of the Government. In all communications with third parties in connection with this contract, Contractor employees shall identify themselves as Contractor employees and specify the name of the company for which they work. In all communications with other Government contractors in connection with this contract, the Contractor employee shall state that they have no authority to in any way change the contract and that if the other contractor believes this communication to be a direction to change their contract, they should notify the Contracting Officer for that contract and not carry out the direction until a clarification has been issued by the Contracting Officer.

(c) The Contractor shall ensure that all of its employees working on this contract are informed of the substance of this clause. Nothing in this clause shall limit the Government's rights in any way under any other provision of the contract, including those related to the Government's right to inspect and accept the services to be performed under this contract. The substance of this clause shall be included in all subcontracts at any tier.

(END OF CLAUSE)

End of Modification No. 3

14. DESCRIPTION OF AMENDMENT/MODIFICATION cont.

1) The contractor proposed to capture incumbent employees. The contractor's proposal stated the following:

- [REDACTED]

- [REDACTED]

- [REDACTED]

B-4

B-A

This Modification is to incorporate appropriate changes to labor rate ceilings to allow for incumbent employee capture during contract phase-in as proposed in the contractor's proposal. These ceiling increases and additional labor categories are *only* for incumbent capture and do not apply to new hires brought on to support contract task orders following phase-in. Due to the fact that this contract was awarded almost a year late following a protest that was resolved, all new hires are to fall within the [REDACTED] proposed and ceiling rates of the original proposal for first year of this two-year base performance period.

The following paragraph (f) is added under clause B.5 *Estimated Cost Increases*:

**B.5 ESTIMATE COST INCREASES**

(e) In rare circumstances, changes in task focus may require the addition of labor categories beyond the categories included in J.1(a)5. In these cases a request must be submitted by the contractor to the Contracting Officer, demonstrating the insufficiency of the existing labor categories, a description of the proposed labor category including the education and experience levels, proposed and ceiling labor rates, and a cross reference to other contracts that include the proposed labor categories. These additional labor categories, rates and descriptions will be negotiated on a case-by-case basis, and upon determination by the Government that they are fair and reasonable, will be incorporated by modification into Section B of the contract.

(f) The following new labor categories are incorporated into the contract for incumbent employees captured following phase-in:

Listed below are the requested labor categories with their requisite education, experience, and skills. Also listed is the totally burdened rate for the J.1(a)5 proposed rate and ceiling rate.

<u>CATEGORY</u>	<u>Proposed Rate</u>	<u>Ceiling Rate</u>
(1) Aerothermodynamicist IV	[REDACTED]	[REDACTED]
(2) Test Engineer IV	[REDACTED]	[REDACTED]
(3) Material Scientist Engineer IV	[REDACTED]	[REDACTED]
(4) Subject Matter Expert (SME)	[REDACTED]	[REDACTED]

B4

**Aerothermodynamicist IV and Test Engineer IV**

Authority in engineering. Accountable for design, development, test, implementation, and analysis. Recognized as the technical expert and resource in specialized areas of engineering. Recommends alterations and enhancements to improve quality of products and/or procedures. Requires a minimum of a Master's Degree in engineering and may be expected to have a related

advanced education and normally possess 17 years of related experience. Consummate expert in a variety of the field's concepts, practices, and procedures. Relies on extensive experience and judgment to plan and accomplish goals. Responsible and accountable for the solution of complex total system problems. Directs, guides, and coordinates activities of a team(s) of technical personnel performing complex engineering activities. A wide degree of autonomy, creativity and latitude is expected.

**Material Scientist Engineer IV**

Recognized authority in specialized field of engineering. Accountable for design, development, test, implementation, and analysis. Recognized by peers as the technical expert and resource in material science specialized areas of engineering. Recommends enhancements to improve quality of products and/or procedures. Requires a minimum of a Master's Degree in engineering and may be expected to have a related advanced education and normally possess 15 years of related experience. Consummate expert in a variety of the field's concepts, practices, and procedures. Relies on extensive experience and judgment to plan and accomplish goals. Responsible for the solution of complex total system problems. Coordinates activities of a team(s) of technical personnel performing complex engineering activities. A wide degree of autonomy, creativity and latitude is expected.

**Subject Matter Expert (SME)**

Recognized as a technical expert and resource in specialized areas of engineering. Recommends alterations and enhancements to improve quality of products and/or procedures to top management. Requires a minimum of a Master's Degree in engineering and may be expected to have a related advanced education and normally possess 20 years of related experience. Consummate expert in a variety of the field's concepts, practices, and procedures. Relies on extensive experience and judgment to brief management staff and senior government personnel. Instrumental in helping solve complex total system problems. A wide degree of autonomy, creativity and latitude is expected. Considered a technical peer to management and a valued member of the contract's inner circle.

SMEs will be used sparingly and only for those crucial areas where their support is necessary and shall not exceed 5% of a normal work week.

(END OF CLAUSE)

2) Attachment J.1(a)(5) titled: *Incumbent Proposed and Ceiling Rates* is incorporated into the contract to capture the incumbent proposed rates and ceiling rates by year for all five years of contract performance, if all options were to be exercised.

3) All other terms and conditions remain the same.

End of Modification No. 2

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES	
2. AMENDMENT/MOD NO. 1			3. EFFECTIVE DATE See Block 16C		4. REQUISITION/PURCHASE REQ. NO. 4200351755 and 4200355261
5. PROJECT NO.			7. ADMINISTERED BY		CODE
NASA Ames Research Center ATTN: Zachary Burkland Mailstop 241-1 Moffett Field, CA 94035-0001			CODE		
8. NAME AND ADDRESS OF CONTRACTOR (No. Street, County, State and ZIP Code) ERC, Inc. 4901 Corporate Drive, Suite E Huntsville, AL 35805			(9)	9A. AMENDMENT OF SOLICITATION NO	
			<input type="checkbox"/>	9B. DATED (SEE ITEM 11)	
			(10)	10A. MOD. OF CONTRACT/ORDER No NNA10DE12C	
CODE	FACILITY CODE		<input checked="" type="checkbox"/>	10B. DATED (SEE ITEM 13) 4/1/10	
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 OR 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)					
R:4200351755 and 4200355261 Obligate: [REDACTED] PPC:BX Financial Management					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
<input type="checkbox"/> 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.					
<input type="checkbox"/> 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).					
<input type="checkbox"/> C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:					
<input checked="" type="checkbox"/> D. OTHER (Specify type of modification and authority) Section I, FAR 52.232-22, Limitation of Funds (MAR 1989) (Unilateral)					
IMPORTANT: Contractor IS NOT 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 the modification is to obligate [REDACTED] to the contract.					
See 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.					
15. NAME AND TITLE OF SIGNER (Type or print)			16A. NAME AND TITLE OF CONTRACTING OFFICER		
			Natalie LeMar - Contracting Officer		
15B. CONTRACTOR/OFFEROR		16B. UNITED STATES OF AMERICA		16C. DATE SIGNED	
(Electronic Signature Applied)		NATALIE LEMAR (8/30/2010)		(Electronic Signature Applied)	
NSN 7540-01-152-8070 PREVIOUS EDITION UNUSABLE		30-105		STANDARD FORM 30 (REV. 10-83) ES Prescribed by GSA FPMR (41 CFR)	

14. DESCRIPTION OF AMENDMENT/MODIFICATION cont.

1) This Modification is to obligate funding in the amount of [REDACTED] to the contract. Therefore, Section B, paragraph B.7, NFS 1852.232-81 CONTRACT FUNDING (JUN 1990), is deleted entirely and replaced by the following:

B-4

B.3. CONTRACT FUNDING (NFS 1852.232-81) (JUNE 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 contract is \$1,727,853.20. This allotment is for the line items 01A and 01B and covers the following estimated period of performance: date of award through November 25, 2010.

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

B-X

SUMMARY OF CONTRACT FUNDING	FROM	BY	TO
Cost	\$181,096.00	\$1,546,757.20	\$1,727,853.20
Fixed Fee	[REDACTED]	[REDACTED]	[REDACTED]
Total Cost Plus Fixed Fee	[REDACTED]	[REDACTED]	[REDACTED]

] B-4

(END OF CLAUSE)

2) All other terms and conditions remain the same.

End of Modification No. 01

**STATEMENT OF WORK**  
**For**  
**SPACE TECHNOLOGY RESEARCH AND DEVELOPMENT**

**1.0 INTRODUCTION**

The principal purpose of this contract is to provide support to the Space Technology Division at NASA Ames Research Center to carry out their varied research programs. This document describes the current and anticipated research programs of the Division. The major objective is the development of technologies for use in the design and fabrication of prototype vehicles that travel at hypervelocities in the atmosphere of Earth and other bodies in the solar system. Other projects include NASA missions in nanotechnology, advanced materials, sensors and devices.

**2.0 SCOPE OF WORK****2.1 GENERAL SCOPE**

The scope of the effort to be performed within the Space Technology Division is described in this section.

The Contractor shall provide multidisciplinary engineering research and development, pursuant to task assignments issued by the Contracting Officer. These services shall include the personnel, facilities, equipment and materials (unless otherwise provided by the Government) to accomplish the tasks.

Task assignments will be issued to perform services in the following areas: project management, systems engineering, research and analysis, design and development, testing, computer modeling, technical writing,, support for third party Quality System, administrative support, computer system administration, organizing and facilitating technical and working meetings and invitational travel for outside researchers, and other functions, which may include fabrication and fabrication support, necessary to complete projects. The Contractor shall provide management and administrative functions necessary to effectively and efficiently manage the work performed under this contract.

The Contractor shall perform services required by task order in the following technical areas:

- a) chemistry and physics of hypersonic, chemically reacting, and radiating flows
- b) aerothermodynamic analysis of entry systems
- c) development, modification, and application of computational fluid dynamics tools
- d) aeronautics and space vehicle trajectory analysis
- e) materials science and engineering of ablative, reusable and multi-functional thermal protection materials
- f) experiment planning, execution, and analysis for high-enthalpy testing of materials and real-gas phenomena
- g) quantum computing and pre-biotic geochemistry mechanisms
- h) educational outreach
- i) internship employment opportunities to support STRAD requirements for NASA programs and to provide students with exposure to public service, enhancement of their educational experience, and financial support to encourage their educational goals

Facilities and labs which may be used during performance of this contract include, but are not limited to:

- a) Electric Arc-driven Shock Tube (EAST)
- b) ballistic range complex
- c) arc jet complex
- d) ceramics lab
- e) materials development lab
- f) materials characterization lab
- g) ultra high temperature ceramics lab

Specific requirements will be defined for each task order according to the current and future needs of programs and projects involving the Space Technology Division. The Contractor may be tasked to accomplish either an entire project from conception to operation, or a specific part of a project such as design or testing.

## **2.2 CONTRACTOR RESPONSIBILITIES**

The Contractor's responsibilities shall include the management of contractor and subcontractor personnel, timely and effective implementation of task assignments, contract and monitoring of contract and subcontract performance, management of scheduled deliveries, and timely and effective reporting to the Government. These responsibilities shall also include efficient cost management methods as well as procedures to ensure that the Government is aware of task assignment status and progress achieved. Management includes managing financial, contractor and subcontractor personnel, and facility resources as well as conforming to established NASA policies and to budgetary guidelines. Most of the work will be performed on-site at Ames Research Center, Moffett Field, California.

The Contractor shall participate with the Government to upgrade and maintain required plans, procedures, and work instructions in order to maintain the organization's compliance with any third-party quality system and shall participate in any audits to maintain the quality system certification. Where the Contractor has primary responsibility for a functional or business area, the Contractor shall have primary responsibility for maintaining compliant documentation associated with that area.

The Contractor shall provide qualified management personnel, organizational structure, procedures and administration support functions to effectively and efficiently manage the work performed under this contract. The management and administrative structure shall provide a single point of contact for interface to the Contracting Officer's Technical Representative (COTR) and shall provide procedures and management supervision to ensure compliance with applicable government regulations for accomplishing this contract.

The Contractor shall be responsible for ensuring that all contractor and subcontractor personnel engaged in performance of this Statement of Work have appropriate qualifications, knowledge, and certification to perform work in accordance with the task assignments. The Contractor must have the flexibility to hire personnel at all appropriate levels of skills and experience, including, but not limited to, university students, post-docs, technicians, junior and senior research scientists and engineers. The Contractor

will support the Space Technology Division's goals to acquire a highly skilled workforce that is aligned with NASA missions and continues to value intellectual advantage and synergy that is made possible by a diverse workforce. The Contractor will ensure that all foreign national visitors and all employees have completed the required background checks, approvals and clearance requirements for access to the NASA Ames Research property.

The Contractor shall provide computer system administration support necessary for the fulfillment of the work of this contract, when tasked by the Government. This work shall include on-site IT support services and trouble calls of desktop, laptop, workstation and server computers and associated peripheral equipment and office equipment, such as fax machine and color printers for the Space Technology Division.

Research office and laboratory space, computer hardware, and software, deemed necessary for the direct fulfillment of the task orders will be provided by the Government. The Contractor may purchase, with COTR approval, and in accordance with the Subcontracts clause at FAR 52.244-2, any materials (consumables and non-consumables) necessary for the fulfillment of their task requirements.

The Contractor shall comply with the health and safety requirements contained in APG 1700-1 and the system safety and mission assurance requirements in NPG 7120.5, NASA Program and Project Management Processes and Requirements, and Space Technology Division processes and procedures.

The contractor shall also support educational outreach and internship employment opportunities to augment NASA programs. NASA Ames supports various student employment programs, from high school to postdoctoral levels, which provide students with exposure to public service, enhancement of their educational experience, and financial support to encourage their educational goals.

### **3.0 REQUIREMENTS**

#### **3.1 GENERAL**

##### **3.1.1 Technologies**

The Space Technology Division develops technologies for use in the design and fabrication of vehicles that travel at hypervelocities in the atmospheres of the Earth and other bodies in the solar system. Flight envelopes include access to orbit and reentry, planetary entry, and high altitude aerobraking. Relevant flow physics are studied using both theoretical and experimental means. Thermal protection materials and systems are developed which can withstand these environments. High enthalpy facilities are operated and developed in support of the experimental work, and research into innovative facilities for the future is carried out as well. Multidisciplinary research is conducted across branch lines.

##### **3.1.2 Customer Focus**

The Division maintains a customer focus and is committed to ensuring the transfer and use of its technologies by the commercial aerospace industry, the rest of NASA, other government laboratories and academia. The Division develops and applies technology

in support of numerous projects for a variety of customers including industry, DOD, and other NASA centers. Near term projects include Crew Exploration Vehicle (Orion), Mars Science Laboratory (MSL), Hypersonics, and projects related to the In-Space Propulsion, New Frontiers, Shuttle Return-to-Fight Programs, and others. Longer-term missions, requiring a wider range of advanced technologies, include aerobraking space exploration missions, and other highly reusable launch and entry vehicles. A project office is located at the division level to provide project management and coordination across the branches. In addition, the division maintains a basic research program that addresses advancements in the underlying technologies that are fundamental to all of these missions.

### **3.2 SPECIFIC REQUIREMENTS**

#### **3.2.1 Administrative Support**

The Division requires technical information management support for both project-related tasks and general support tasks. Administrative support is required to ensure that technical publications receive the necessary approvals and reviews, and that the Division web sites conform to NASA requirements for information release and ease of access.

##### **3.2.1.1 Contractor Responsibilities**

The Contractor may be required, by task order, to provide the following support:

- a) Technical assistance for web development, preparation of displays, posters, brochures, manuals, publications, presentations, and travel orders.
- b) Preparation of graphics and presentation materials
- c) Management of archival records and documents
- d) Assistance in financial and administrative support, including but not limited to purchase and service requests, and bankcards.
- e) Provide administrative support in the development of non-technical publications, such as marketing plans, strategic plans, and reports; control and preparation of forms and documentation; and management of laboratory and office supplies.

#### **3.2.2 Reacting Flow Environments**

##### **3.2.2.1 General**

This area includes:

- Applied aerothermodynamic analysis of current and future NASA launch vehicles, crewed spacecraft, and unmanned planetary probes and Earth entry vehicles using in-house Computational Fluid Dynamics (CFD) and shock layer radiation codes
- Studies of real gas physics in hypersonic, reacting gas flows and development/implementation of new physical models into modern CFD and shock layer radiation codes
- Participation in design activities in support of vehicle and mission studies that rely on aerothermal environment modeling in conjunction with Thermal Protection

System (TPS) sizing and selection, trajectory trades, and overall vehicle performance/feasibility trades

- Experimental efforts that are complemented by a theoretical/computational program. Numerical algorithm enhancements and modifications to existing in-house reacting flow solvers are assessed and implemented as appropriate based on the ongoing research/project requirements. Emphasis is placed on code validation by laboratory experiment and available flight data
- Planning and implementation of flight experiments for aerothermodynamic research
- Supporting integrated design system efforts as needed to improve the vehicle/mission design process by injecting higher fidelity modeling earlier in the design process

### 3.2.2.2 Contractor Responsibilities

The Contractor shall be responsible for conducting research and performing applied analysis in the areas described above. Example specific problem areas are given as follows:

- a) Validate, optimize, and apply new Computational Fluid Dynamics (CFD) algorithms in support of thermochemical model development that will allow the design and development of advanced Earth-to-orbit and planetary entry vehicles
- b) Support aerothermal environment prediction and TPS sizing analysis and design for hypersonic vehicle development projects, such as the Orion command module, including the application of CFD methods and other modeling capabilities
- c) Develop, validate and apply radiation heat transfer calculation methods for the simulation of shock layer and wake radiation for blunt body hypersonic flows
- d) Develop and apply gas-phase kinetics, thermal nonequilibrium, transport, and surface chemistry models for use in simulation of hypersonic blunt body flows
- e) Develop and apply models for the simulation of the flow in high enthalpy facilities for the characterization of facility capabilities and traceability of test conditions to flight
- f) Perform systems analysis on vehicle systems to help guide investment of efforts in the Space Technology Division, including support of design activities in the Center
- g) Perform systems analysis for entry and descent phases of planetary entry vehicles
- h) Perform calibration/validation experiments in concert with theoretical aerothermodynamics for the validation of thermochemical modeling efforts
- i) Develop and apply advanced, state-of-the-art, diagnostics for real-gas testing and data acquisition in shock tubes, ballistic ranges, and arc jets
- j) Design and conduct experiments and models for ballistic range testing

### **3.2.3 Nanotechnology**

#### **3.2.3.1 General**

The Ames Center for Nanotechnology (ACNT) performs fundamental research in nanoscience and nanotechnology and design and development of nanoscale sensors, electronic devices and materials.

#### **3.2.3.2 Contractor Responsibilities**

The Contractor may be required, by task order, to provide the following support:

- f) General administrative and Technical assistance including:
- (1) Web development, preparation of displays, posters, brochures, manuals, publications, presentations, and travel orders. The web development includes maintaining the ACNT database.
  - (2) Management of ACNT archival records and documents
  - (3) Assistance in financial and administrative support including purchase and service requests. Develop and maintain spreadsheets for financial accounting and tracking of all ACNT expenses: contracts, purchase and service requests, job orders, and bankcards. Assist Space Technology Division financial managers in reconciliation of ACNT finances with NASA financial accounting system
  - (4) Sponsor seminar speakers and guests to support NACNT activities
  - (5) Sponsor student interns and faculty visits for education outreach. Sponsor up to 6 full time students
- b) Pre-biotic Geochemistry Mechanisms

Computational study of redox chemical reactions on iron sulfide and iron pyrite mineral surfaces with the goal of testing key components of Wachtershauser's "iron-sulfur world" Hypothesis of prebiotic chemistry at hydrothermal vents on the ocean floor. The long-term goal is to study the coupling of the carbon dioxide reduction mechanism to form methane with the oxidative growth of iron-sulfur mineral surfaces.

- c) Quantum Computing:

The purpose of this task is to develop a theoretical framework for the family of physics-based algorithms and architectures in support of the NASA and DoD tasks in the areas of revolutionary computing and quantum sensors. It is focused on the analysis of algorithm complexity and design of novel architectures that takes into account quantum effects in sensing and computation. The emphasis is in solution of hard combinatorial optimization problems.

### **3.2.4 Thermal Protection Materials and Systems**

#### **3.2.4.1 General**

Activities include development, fabrication, testing (both ground and flight), and computer modeling and analysis of advanced Thermal Protection System (TPS) materials and assemblies for hypersonic vehicles and spacecraft. These efforts include multidisciplinary work on flowfield/surface interactions, TPS/structural interactions, and analysis and instrumentation for flight and ground materials characterization and aerothermal heating tests. Research and technology development is pursued in some base R&T areas as well as in support of specific programs such as reusable launch vehicles, crew exploration vehicles, planetary probes, fundamental aeronautics, and sample return missions. Certain continuing tasks also are required to support, maintain, and upgrade computational and experimental facilities, and software.

#### **3.2.4.2 Contractor Responsibilities**

Contractor personnel perform specific tasks to achieve milestones and meet delivery schedules for tasks in the following areas:

- a) Assure the correct operation and efficient use of local and networked computing systems used for research and project activities including UNIX and Linux workstations, and personal computers. Stay abreast of new hardware and software developments, and provide expert advice on the procurement of new hardware and software. Provide required backups, maintenance and problem solving to help assure reliable computer operations as required. Continue the development, enhancement and distribution of the TPSX material database
- b) Monitor schedules, operations and modifications of Branch analytical and materials characterization labs. The equipment involved includes a scanning electron microscope, IR spectrometer, X-Ray diffraction unit, energy dispersive X-Ray analyses unit, inductively coupled plasma spectrometer, laser particle size analyzer, TGA, and side-arm reactor. Investigate and suggest new equipment acquisitions and to maintain efficient and effective support of Branch activities
- c) Perform data acquisition and analysis in Branch analytical and materials characterization facilities as required in support of research and project activities
- d) For Branch Ceramic and TPS Development Laboratories, fabricate and modify TPS materials to prepare flight hardware and test articles. Also machine metals and ceramics, spray coatings, apply adhesives, and work with flexible insulation as needed. Travel may be required to install, repair, and inspect articles off site
- e) Provide test engineering for the Division's Arc Jet Complex. Activities include all aspects of testing such as evaluation of test feasibility, design of test models including instrumentation, and pre and post test analysis for various programs and research activities
- f) In Branch Laboratories, pursue development of advanced ceramic composites, ceramic/polymer composites, rigid and flexible ceramic TPS, insulations, and ceramic coatings. Models will be fabricated and tested to determine the optimum processing conditions for producing new lightweight ceramics, ablaters, and other

- hybrid materials and systems. Optimization will consider performance, fabrication safety, cost and other factors. Provide equipment training for new users
- g) Support projects as required by doing research and development, planning and scheduling, interacting with others in the Division, Center or at other NASA centers or industry.
  - h) Apply computational tools for design, analysis and optimization of instrumentation, models, TPS and structural components and assemblies for ground and flight experiments and vehicles. This work utilizes in-house codes written primarily in FORTRAN and commercial software such as Pro/E and MSC.MARC. This work includes aerothermal performance analysis and sizing optimization of TPS components and assemblies. Finite element calculations using the MARC software will include thermal analysis as well as thermal and mechanical static and dynamic stress analysis of TPS, structural, and instrumentation components and assemblies
  - i) Develop computational models and tools as required in support of projects and to achieve milestones. These efforts will focus on improved methods for non-CFD aerothermal heating estimation, coupling of aerothermal heating modules with material response solvers (one-dimensional and MARC), specialized software for analysis of laboratory and arc jet test results, and improved material response models for TPS materials
  - j) Provide documentation support to maintain efficient organization of Branch, including travel, supplies, publication and paper documentation, editing, technical writing, and marketing,
  - k) Support proposal development as required.

### **3.2.5 Travel**

Contractor personnel may be required to travel for short periods of time to attend meetings, to participate in industry site visits, or to attend technical conferences. The Contractor will budget for these expenses as well as anticipated publication expenses in the submission of the response to a task order or modification to a task order.

### **3.2.6 CTO Accounting**

Since tasks are internally funded by the ARC requesting organization, contractor expense accountability must be accomplished on a task basis.

## **3.3 PERFORMANCE MEASUREMENT**

The Contractor shall adhere to the performance measurements detailed in each task order.

## **4.0 DELIVERABLES AND REPORTS**

Contract deliverables and reports are identified and described in the Data Requirements List attachment to this contract. Task specific deliverables will be defined in each task.