# AWARD/CONTRACT

| | | | | | |
|---|---|---|---|---|---|
| | 1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700) | RATING DO-C9 | PAGE 1 | OF PAGES 54 | |

| 2. CONTRACT (Proc. Inst. Ident.) NO. NNA05BE28C | 3. EFFECTIVE DATE SEE BLOCK 20B | 4. REQUISITION/PURCHASE REQUEST/PROJECT NO. 4200119271 & 4200119264 |
|---|---|---|

| 5. ISSUED BY CODE JAZ: 243-1 | 6. ADMINISTERED BY (If other than Item 6) CODE |
|---|---|
| NASA Ames Research Center Moffett Field, CA 94035-1000 Attn: Deborah E. Glass, M/S 241-1 (650) 604-3747 | |

| 7. NAME AND ADDRESS OF CONTRACTOR (No. street, county, state and ZIP Code) | 8. DELIVERY |
|---|---|
| Science Applications International Corporation 4031 Colonel Glenn Highway Beavercreek, OH 45431-1601 Attn: Mary Mullineaux (937) 431-4368 Mary.F.Mullineaux@saic.com | ☐ FOB ORIGIN   ☒ OTHER (See below) |
| | 9. DISCOUNT FOR PROMPT PAYMENT N/A |
| | 10. SUBMIT INVOICES  ITEM (4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN: See Clause G.2 |

| CODE  DUNS F95 2126773 | FACILITY CODE  7A914 |
|---|---|

| 11. SHIP TO/MARK FOR CODE See Section J.1(a)4 | 12. PAYMENT WILL BE MADE BY CODE CFG 203-18 |
|---|---|
| | NASA Ames Research Center Accounting Operations Branch, Mail Stop 203-18 Moffett Field, CA 94035-1000 |

| 13. AUTHORITY FOR USING OTHER FULL AND OPEN COMPETITION: | 14. ACCOUNTING AND APPROPRIATION DATA |
|---|---|
| ☐ 10 U.S.C. 2304(c)( )   ☐ 41 U.S.C. 253(c)( ) | OBLIGATE: $77,000 (119271) & $10,000 (119264) |

| 15A. ITEM NO. | 15B. SUPPLIES/SERVICES | 15C. QUANTITY | 15D. UNIT | 15E. UNIT PRICE | 15F. AMOUNT |
|---|---|---|---|---|---|
| | Technical Services for Aerospace Systems Modeling and Simulation | | | Cost and Fees | See B.5 and B.6 |
| | (Section K Representations and Certifications are hereby incorporated by reference.) | | | | |

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**15G. TOTAL AMOUNT OF CONTRACT** [redacted]

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SEE FOLLOWING PAGE

**CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE**

17. ☒ 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. ☐ AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____ including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items 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) Joseph F. Thurnser | 20A. NAME OF CONTRACTING OFFICER DEBORAH E. GLASS |
|---|---|
| 19B. NAME OF CONTRACTOR BY _____ (Signature of person authorized to sign) | 19C. DATE SIGNED May 16, 2005 | 20B. UNITED STATES OF AMERICA BY _Deborah E. Glass_ (Signature of Contracting Officer) | 20C. DATE SIGNED 6/24/05 |

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**B.3    ESTIMATED COST AND AWARD FEE (1852.216-85) (SEP 1993)**
(applicable to CLINS 2 and 3)

The estimated cost of these CLINs is (see tables below).  The maximum available award fee, excluding base fee, if any, is (see tables below).  The base fee is $0.00. Total estimated base fee, and maximum award fee are (see tables below).

(End of Clause)

**B.4    INCENTIVE FEE (applicable to CLIN 5; see H.15)**

The target fee of this CLIN is (see tables below).  The maximum fee for this CLIN is (see tables below). The minimum fee for this CLIN is (see tables below).

(End of Clause)

**B.5    COST/FEE BY PERIOD**

THE BREAKOUT OF ESTIMATED COST/AWARD FEE/INCENTIVE FEE FOR THE BASE PERIOD AND ANY AWARD TERMS IS AS FOLLOWS:

<u>BASE PERIOD*</u>

*The base period of this contract is 5 years, as stated in F.2, unless award periods are lost in accordance with Section H.16.

| Period Covered | Estimated Cost (all CLINS) | Award Fee | Incentive Fee (see H.15) | Total |
|---|---|---|---|---|
| 1/Year 1 | ▓▓▓▓ | ▓▓▓ | (Min) ▓▓▓ | ▓▓▓ |
| 2/Year 2 | ▓▓▓ | ▓▓▓ | (Max) (Min) | ▓▓▓ |
| 3/Year 3 | ▓▓▓ | ▓▓▓ | (Max) (Min) | ▓▓▓ |
| 4/Year 4 | ▓▓▓ | ▓▓▓ | (Max) (Min) | ▓▓▓ |
| 5/Year 5 | ▓▓▓ | ▓▓▓ | (Max) (Min) | ▓▓▓ |
| Total Base Period | ▓▓▓ | ▓▓▓ | (Max) (Min) (Max) | ▓▓▓ |

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<u>FIRST AWARD TERM PERIOD</u>

| Period Covered | Estimated Cost (all CLINS) | Award Fee | Incentive Fee (see H.15) | Total |
|---|---|---|---|---|
| 6/Year 5.0 – 5.5 (6 add'l months) | ▓▓▓ | ▓▓▓ | (Min) (Max) | ▓▓▓ |

*B-4*

## SECOND AWARD TERM PERIOD

Period
Covered
7/Year 5.5 – 6.0
(6 add'l months)

Estimated Cost
(all CLINS)

Award
Fee

Incentive
Fee (see H.15)        Total
(Min)
(Max)

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## THIRD AWARD TERM PERIOD

Period
Covered
8/Year 6.0 – 7.0
(12 add'l months)

Estimated Cost
(all CLINS)

Award
Fee

Incentive
Fee (see H.15)        Total
(Min)
(Max)

## FOURTH AWARD TERM PERIOD

Period
Covered
9/Year 7.0 – 8.0
(add'l 12 months)

Estimated Cost
(all CLINS)

Award
Fee

Incentive
Fee (see H.15)        Total
(Min)
(Max)

*B-4*

## FIFTH AWARD TERM PERIOD

Period
Covered
10/Year 8.0 – 9.0
(add'l 12 months)

Estimated Cost
(all CLINS)

Award
Fee

Incentive
Fee (see H.15)        Total
(Min)
(Max)

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## SIXTH AWARD TERM PERIOD

Period
Covered
11/Year 9.0 – 9.5
(add'l 6 months)

Estimated Cost
(all CLINS)

Award
Fee

Incentive
Fee (see H.15)        Total
(Min)
(Max)

## SEVENTH AWARD TERM PERIOD

Period
Covered
12/Year 9.5 – 10
(add'l 6 months)

Estimated Cost
(all CLINS)

Award
Fee

Incentive
Fee (see H.15)        Total
(Min)
(Max)

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(End of Clause)

## B.6  CONTRACT VALUE SUMMARY TABLE

(a) The total contract value for all CLINS, for the base and all award term periods, if earned, is as follows:

| Period(s) | CLIN 1 (Ref. B-2) | CLINS 2, 3 (Ref. B-3) | CLIN 4 (Ref. B-2) | CLIN 5 (Ref. B-4) | TOTAL |
|---|---|---|---|---|---|
| 1 – 5 | $0 | ███ | ███ | ███ | ███ |
| 6 | $0 | | | | |
| 7 | $0 | | | | |
| 8 | $0 | | | | |
| 9 | $0 | | | | |
| 10 | $0 | | | | |
| 11 | $0 | | | | |
| 12 | $0 | | | | |
| 10-Year TOTAL | $0 | | | | |

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(End of Clause)

## B.7  CONTRACT FUNDING (NFS 1852.232-81) (JUN 1990) (applicable to all SOW Sections)

(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 increased FROM ████ By: $XX; To: $XX.  This allotment is for the Contractor's performance of Section B.1.a and covers the following estimated period of performance: August 1, 2005 through August 5, 2005.  *B-4*

(b) An additional amount of ████ s obligated under this contract for payment of Materials.

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(c) An additional amount of ████ s obligated under this contract for payment of award fee.

(d) For summary purposes, the total amount obligated is:

| | FROM | BY | TO |
|---|---|---|---|
| Estimated Cost | ████ | | |
| Materials | ████ | *B-4* | |
| Award Fee | ████ | | |
| Total CPAF | ████ | | |

(End of Clause)

[END OF SECTION]

Modification 1
Last Changed by:  Basic

## H.9  SEVERANCE PAY (ARC 52.231-90) (MAY 1993)

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)

## H.10  KEY PERSONNEL AND FACILITIES (NASA 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.

**Hardware Eng Technical Group Leader:**
**Site Manager:**
**Outreach Manager:**

(End of Clause)

| | | |
|---|---|---|
| 52.244-2 | AUG 1998 | SUBCONTRACTS Insert "Any with software license agreements" in paragraph (e) and ▬▬▬▬ in paragraph (k) (ALTERNATE I) (AUG 1998) |
| 52.244-5 | DEC 1996 | COMPETITION IN SUBCONTRACTING |
| 52.244-6 | JUL 2004 | SUBCONTRACTS FOR COMMERCIAL ITEMS |
| 52.245-1 | APR 1984 | PROPERTY RECORDS |
| 52.245-5 | MAY 2004 | GOVERNMENT PROPERTY (COST-REIMBURSEMENT, TIME-AND- MATERIAL, OR LABOR-HOUR CONTRACTS) |
| 52.246-25 | FEB 1997 | LIMITATION OF LIABILITY-- SERVICES |
| 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 |
|---|---|---|
| 1852.204-76 | NOV 2004 | SECURITY REQUIREMENTS FOR UNCLASSIFIED INFORMATION TECHNOLOGY RESOURCES Insert "within 60 days" in paragraph (c). |
| 1852.216-89 | JUL 1997 | ASSIGNMENT AND RELEASE FORMS |
| 1852.219-74 | SEP 1990 | USE OF RURAL AREA SMALL BUSINESSES |
| 1852.219-75 | MAY 1999 | SMALL BUSINESS SUBCONTRACTING REPORTING |
| 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 |
| 1852.237-70 | DEC 1988 | EMERGENCY EVACUATION PROCEDURES |
| 1852.243-71 | MAR 1997 | SHARED SAVINGS |

(End of Clause)

I.2    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 Board, 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.

Modification 1

| AWARD/CONTRACT | 1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700) | RATING DO-C9 | PAGE 1 | OF PAGES 54 |
|---|---|---|---|---|

| 2. CONTRACT (Proc. Inst. Ident.) NO. NNA05BE28C | 3. EFFECTIVE DATE SEE BLOCK 20B | 4. REQUISITION/PURCHASE REQUEST PROJECT NO. 4200119271 & 4200119264 |
|---|---|---|

| 5. ISSUED BY | CODE | JAZ: 243-1 | 6. ADMINISTERED BY (If other than item 5) | CODE |
|---|---|---|---|---|

5. ISSUED BY

NASA Ames Research Center
Moffett Field, CA 94035-1000
Attn: Deborah E. Glass, M/S 241-1 (650) 604-3747

| 7. NAME AND ADDRESS OF CONTRACTOR (No. street, county, state and ZIP Code) | 8. DELIVERY |
|---|---|
| Science Applications International Corporation<br>4031 Colonel Glenn Highway<br>Beavercreek, OH 45431-1601<br>Attn: Mary Mullineaux<br>(937) 431-4368<br>Mary.F.Mullineaux@saic.com | ☐ FOB ORIGIN  ☒ OTHER (See below) |
| | 9. DISCOUNT FOR PROMPT PAYMENT<br>N/A |
| | 10. SUBMIT INVOICES<br>(4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN:  ITEM  See Clause G.2 |

| CODE TIN #95-2126773 | FACILITY CODE 2X914 |
|---|---|

| 11. SHIP TO/MARK FOR | CODE | 12. PAYMENT WILL BE MADE BY | CODE CFG.203.18 |
|---|---|---|---|
| See Section J.1(a)4 | | NASA Ames Research Center<br>Accounting Operations Branch, Mail Stop 203-18<br>Moffett Field, CA 94035-1000 | |

| 13. AUTHORITY FOR USING OTHER FULL AND OPEN COMPETITION: | 14. ACCOUNTING AND APPROPRIATION DATA |
|---|---|
| ☐ 10 U.S.C. 2304(c)( )    ☐ 41 U.S.C. 253(c)( ) | OBLIGATE: $77,000 (119271) & $10,000 (119264) |

| 15A. ITEM NO. | 15B. SUPPLIES/SERVICES | 15C. QUANTITY | 15D. UNIT | 15E. UNIT PRICE | 15F. AMOUNT |
|---|---|---|---|---|---|
| | Technical Services for Aerospace Systems Modeling and Simulation<br><br>(Section K Representations and Certifications are hereby incorporated by reference.) | | | Cost and Fees | See B.5 and B.6 |

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| | 15G. TOTAL AMOUNT OF CONTRACT ██████ |
|---|---|

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| | A | SOLICITATION/CONTRACT FORM | | | I | CONTRACT CLAUSES | |
| | B | SUPPLIES OR SERVICES AND PRICE/C | SEE FOLLOWING PAGE | | J | DOCUMENTS, EXHIBITS AND OTHER ATTACH. | |
| | C | DESCRIPTION/SPECS./WORK STATEM | | | | ATTACHMENTS | |
| | D | PACKAGING AND MARKING | | | | **PART IV - REPRESENTATIONS AND INSTRUCTIONS** | |
| | E | INSPECTION AND ACCEPTANCE | | | K | REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS | |
| | F | DELIVERIES OR PERFORMANCE | | | | | |
| | G | CONTRACT ADMINISTRATION DATA | | | L | INSTRS., CONDS., AND NOTICES TO OFFERORS | |
| | H | SPECIAL CONTRACT REQUIREMENTS | | | M | EVALUATION FACTORS FOR AWARD | |

**CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE**

| 17. ☒ 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. ☐ AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number _____, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items 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) Joseph F. Thumser | 20A. NAME OF CONTRACTING OFFICER DEBORAH E. GLASS |
|---|---|
| 19B. NAME OF CONTRACTOR<br>BY _____<br>(Signature of person authorized to sign) | 19C. DATE SIGNED May 16, 2005 | 20B. UNITED STATES OF AMERICA<br>BY _Deborah E. Glass_<br>(Signature of Contracting Officer) | 20C. DATE SIGNED 6/24/05 |

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## PART II – CONTRACT CLAUSES

## PART III - LIST OF DOCUMENTS, EXHIBITS, AND ATTACHMENTS

## PART I - THE SCHEDULE

## SECTION B - SUPPLIES OR SERVICES AND PRICE/COSTS

B.1    SUPPLIES/SERVICES TO BE PROVIDED (ARC 52.211-94) (FEB 1997)

(a) 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.

| Contract Line Item Number (CLIN) | DESCRIPTION | Section C (Statement of Work) | Section F (Period of Performance) | CLIN Contract Type |
|---|---|---|---|---|
| 1 | Technical Services for the Simulation Facilities for Phase-In Period in accordance with the Phase-In Plan | Phase-In | F.2(a) | Cost Only |
| 2, 3 | Technical Services for the Simulation Facilities, including the Data Deliverables as set forth in Attachment J.1(a)4 | 2.0, 3.0 (excluding 3.5.2.2), 4.0 & 6.0 | F.2(b) – (c) | Cost Plus Award Fee (CPAF) |
| 4 | Material Purchases | 3.5.1.5 | F.2(b) – (c) | Cost Only |
| 5 | Non-Directed Outreach | 3.5.2.2 | F.2(b) – (c) | Incentive Fee Only |

B.2    ESTIMATED COST (1852.216-81) (DEC 1988) (applicable to CLINs 1 and 4)

CLIN 1:

The total estimated cost for complete performance of CLIN 1 is (see tables below). See FAR clause 52.216-11, Cost Contract--No Fee, of this contract.

CLIN 4:

The total estimated cost for complete performance of CLIN 4 is (see tables below). See FAR clause 52.216-11, Cost Contract--No Fee, of this contract.

(End of Clause)

B.3    ESTIMATED COST AND AWARD FEE (1852.216-85) (SEP 1993)
       (applicable to CLINS 2 and 3)

The estimated cost of these CLINs is (see tables below). The maximum available award fee, excluding base fee, if any, is (see tables below). The base fee is $0.00. Total estimated base fee, and maximum award fee are (see tables below).

(End of Clause)

B.4    INCENTIVE FEE (applicable to CLIN 5; see H.15)

The target fee of this CLIN is (see tables below). The maximum fee for this CLIN is (see tables below). The minimum fee for this CLIN is (see tables below).

(End of Clause)

B.5    COST/FEE BY PERIOD

THE BREAKOUT OF ESTIMATED COST/AWARD FEE/INCENTIVE FEE FOR THE BASE PERIOD AND ANY AWARD TERMS IS AS FOLLOWS:

### BASE PERIOD*

*The base period of this contract is 5 years, as stated in F.2, unless award periods are lost in accordance with Section H.16.

| Period Covered | Estimated Cost (all CLINS) | Award Fee | Incentive Fee (see H.15) | Total |
|---|---|---|---|---|
| 1/Year 1 | ████ | ████ | (Min) ████ | ████ |
| 2/Year 2 | ████ | ████ | (Max) (Min) | ████ |
| 3/Year 3 | ████ | ████ | (Max) (Min) | ████ |
| 4/Year 4 | ████ | ████ | (Max) (Min) | ████ |
| 5/Year 5 | ████ | ████ | (Max) (Min) | ████ |
| Total Base Period | ████ | ████ | (Max) (Min) (Max) | ████ |

### FIRST AWARD TERM PERIOD

| Period Covered | Estimated Cost (all CLINS) | Award Fee | Incentive Fee (see H.15) | Total |
|---|---|---|---|---|
| 6/Year 5.0 – 5.5 (6 add'l months) | ████ | ████ | (Min) ████ (Max) | ████ |

## SECOND AWARD TERM PERIOD

Period
Covered
7/Year 5.5 – 6.0
(6 add'l months)

Estimated Cost
(all CLINS)  ██████

Award
Fee  ██████

Incentive
Fee (see H.15)  Total
(Min)  ██████
(Max)

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## THIRD AWARD TERM PERIOD

Period
Covered
8/Year 6.0 – 7.0
(12 add'l months)

Estimated Cost
(all CLINS)  ██████

Award
Fee  ██████

Incentive
Fee (see H.15)  Total
(Min)  ██████
(Max)

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## FOURTH AWARD TERM PERIOD

Period
Covered
9/Year 7.0 – 8.0
(add'l 12 months)

Estimated Cost
(all CLINS)  ██████

Award
Fee  ██████

Incentive
Fee (see H.15)  Total
(Min)  ██████
(Max)

*B-4*

## FIFTH AWARD TERM PERIOD

Period
Covered
10/Year 8.0 – 9.0
(add'l 12 months)

Estimated Cost
(all CLINS)  ██████

Award
Fee  ██████

Incentive
Fee (see H.15)  Total
(Min)  ██████
(Max)

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## SIXTH AWARD TERM PERIOD

Period
Covered
11/Year 9.0 – 9.5
(add'l 6 months)

Estimated Cost
(all CLINS)  ██████

Award
Fee  ██████

Incentive
Fee (see H.15)  Total
(Min)  ██████
(Max)

*B-4*

## SEVENTH AWARD TERM PERIOD

Period
Covered
12/Year 9.5 – 10
(add'l 6 months)

Estimated Cost
(all CLINS)  ██████

Award
Fee  ██████

Incentive
Fee (see H.15)  Total
(Min)  ██████
(Max)

(End of Clause)

## B.6 CONTRACT VALUE SUMMARY TABLE

(a) The total contract value for all CLINS, for the base and all award term periods, if earned, is as follows:

| Period(s) | CLIN 1 (Ref. B-2) | CLINS 2, 3 (Ref. B-3) | CLIN 4 (Ref. B-2) | CLIN 5 (Ref. B-4) | TOTAL |
|---|---|---|---|---|---|
| 1 – 5 | $0 | ███ | ███ | ███ | ███ |
| 6 | $0 | | | | |
| 7 | $0 | | | | |
| 8 | $0 | | | | |
| 9 | $0 | | | | |
| 10 | $0 | | | | |
| 11 | $0 | | | | |
| 12 | $0 | | | | |
| 10-Year TOTAL | $0 | | | | |

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(End of Clause)

## B.7  CONTRACT FUNDING (NFS 1852.232-81) (JUN 1990) (applicable to all SOW Sections)

(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 increased FROM $██████ By: $XX; To: $XX.  This allotment is for the Contractor's performance of Section B.1.a and covers the following estimated period of performance: August 1, 2005 through August 5, 2005.   B-4

(b)  An additional amount of $0.00 is obligated under this contract for payment of Materials.

(c)  An additional amount of ██████ is obligated under this contract for payment of award fee.   B-4

(d)  For summary purposes, the total amount obligated is:

| | FROM | BY | TO |
|---|---|---|---|
| **Estimated Cost** | ███ | | |
| **Materials** | ███   B-4 | | |
| **Award Fee** | ███ | | |
| **Total CPAF** | ███ | | |

(End of Clause)

[END OF SECTION]

Modification 1
Last Changed by:  Basic

## SECTION C - DESCRIPTION/SPECIFICATION/WORK STATEMENT

### C.1  DESCRIPTION/SPECIFICATION/WORK STATEMENT  (ARC 52.211-93) (FEB 1997)

(a)  In accordance with the contract's terms and conditions, the Contractor shall furnish all personnel, services, equipment, materials, and facilities and do all other things necessary for, or incidental, to performance of the requirements set forth herein.

(b)  Work shall be accomplished in accordance with the Statement of Work entitled *Technical Services for Aerospace Systems Modeling and Simulation* as follows:

(End of Clause)

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## 1.0   Background

This statement of work describes a requirement for contract services for the Simulation Laboratory Facilities located at the National Aeronautics and Space Administration's (NASA) Ames Research Center. The work to be performed is to provide operations, development, maintenance, and modification of the Simulation Laboratory Facilities, as authorized by NASA through Contract Task Orders (CTOs).

## 1.1   Mission Description

The Simulation Laboratory Facilities are unique national research and development facilities dedicated to providing researchers with high-fidelity environments in which to conduct simulated flight research and to advance the state-of-the-art of simulation technology. Researchers use the facilities to investigate a variety of topics ranging from the design of new aircraft guidance and control systems to the human factors implications of new or existing flight deck displays, airspace operations, air traffic control and automation. In-house projects and experiments are conducted to develop new simulator systems and subsystems, improve simulation systems, develop advanced engineering techniques to improve the fidelity and validity of simulation programs, and incorporate the latest technology into simulation systems. The Simulation Laboratory Facilities are primarily comprised of the Crew-Vehicle Systems Research Facility (CVSRF), the Vertical Motion Simulation Complex (VMSC) and Future Flight Central (FFC).

The Simulation Laboratory Facilities are currently managed by the Aeronautics Directorate. The Aeronautics Directorate manages these facilities through civil service line managers, who, in conjunction with the Contractor, are ultimately responsible for the successful performance of the mission of each facility.

As authorized by NASA through CTOs, the Contractor is responsible for the successful preparation and operation of the simulators, collection of research data as specified in the task order, and the continuing operation and upgrades of the facilities. It is not the responsibility of the Contractor to ensure that the data validate or invalidate any scientific theories, ideas, or designs.

The Contractor is also responsible for development, testing and validation of advanced air traffic management automation tools being developed at NASA Ames. These tools are anticipated to be integrated in the full simulation environment to support future research.

Together, the efforts of the NASA management and the contract staff are required to accomplish the mission of each facility.

The simulation facilities are used by NASA programs, other NASA Centers, the Federal Aviation Administration, the Department of Defense, the National Transportation Safety Board, other government organizations, industry and universities.

1.2    Simulators/Facilities

The work in these facilities includes simulation of a wide variety of aircraft configurations including helicopters, advanced lift-fan aircraft, jet transports, modern concepts for Vertical/Short Take-Off and Landing (V/STOL) vehicles, Space Shuttle, and their guidance, control, and mission management systems, as well as air traffic management. The developmental nature of the work involves the continuous upgrading of capabilities, facilities and the advancement of the state-of-the-art of simulation technology.

The VMSC with its large amplitude motion system provides piloted, real-time flight simulation of proposed and existing vehicles. The dynamic and flexible research environment lends itself to simulation studies involving controls, guidance, displays, automation, handling qualities, flight deck systems, and accident/incident investigations. The facility is used to examine new guidance and control law algorithms and to evaluate handling qualities and characteristics. The VMSC, besides the large motion capability, has other laboratories for development, checkout and fixed base operations and five interchangeable cabs which are configured for a given simulation requirement.

The CVSRF is used to analyze performance characteristics of flight crews, formulate principles and design criteria for future aviation environments and evaluate new air traffic control procedures through the use of full-mission simulation. The CVSRF includes two full mission flight simulators - a Boeing 747-400 Flight Simulator and an Advanced Concepts Flight Simulator (ACFS). In addition, the facility includes an Air Traffic Control (ATC) Simulator.

FFC is a full-scale Air Traffic Control (ATC) tower simulation facility used to test and evaluate airport design operational issues. The facility features a 360 degrees out the window visual scene of a realistic airport environment. It is used to test procedural changes, enhance airport ramp procedures, optimize taxi routes and examine the implementation of new technologies to improve airport surface management and operations.

In addition, the Simulation Laboratory Facilities support Simulation Development Stations used to design and develop models, scenarios and components in a workstation environment prior to integration into the full simulation environment.

Technical services are provided in support of air traffic management automation projects. These include the software design, implementation, and maintenance support for real-time Air Traffic Control simulation software and FAA/NASA systems interface software.

1.2.1   Location of Simulators/Facilities

The Simulation Laboratory Facilities are currently located in Buildings N-243, N-257 and N-262. These facilities are collectively referred to as SimLabs. In addition, other facilities include partial task Simulation Development Stations located within various buildings throughout Ames Research Center.

## 1.2.2   Simulators and Related Facilities

1.2.2.1        Crew-Vehicle Systems Research Facility (CVSRF) - Building N-257

- Advanced Concepts Flight Simulator (ACFS)
- Boeing 747-400 Flight Simulator
- Air Traffic Control (ATC) Simulator

1.2.2.2        Vertical Motion Simulation Complex (VMSC) - Building N-243

- Vertical Motion Simulator (VMS)
- Interchangeable Cab 1 (I-Cab1) fixed-base area
- Interchangeable Cab 2 (I-Cab2) fixed-base area

1.2.2.3        FutureFlight Central – Building N-262

FutureFlight Central is a single, integrated, air traffic control tower simulator capable of simulating all aspects of tower operation, tower ATM, ramp control, etc.

## 2.0   Scope

NASA is responsible for the overall management and performance of the Flight Simulation Facilities. NASA's management is responsible for the solicitation and acceptance of research customers. NASA is also responsible for overall scheduling and planning of all simulation resources and labs for all simulation experiments and simulation technology projects in the SimLabs. NASA is responsible for technology assessment, the definition of long-term requirements and new capabilities for simulation systems and technology, and the acceptance and integration of new technology. NASA also investigates simulation technology and conducts advanced simulations in support of this research. In addition, NASA conducts simulation experiments and discrete projects to enhance the current capabilities of the simulation facilities. NASA is responsible for the safe operation of all facilities in compliance with Ames Research Center Human Occupancy requirements. NASA supplies general and specific equipment, logistical services and plant engineering management of buildings and building systems so as to provide an efficient and reliable laboratory environment for experiment development and execution. As authorized through CTOs, the Contractor will be responsible for developing, integrating, testing and executing research experiments and discrete projects to meet the SimLabs mission. The CTOs will hold the Contractor responsible, within the context of individual projects, to ensure the fidelity, integrity and quality of experiments and projects as tasked. Thus, it is not only important that the individual subsystems operate properly, but also, that when integrated together all elements continue to perform properly and efficiently.

The Contractor is responsible for the preparation and maintenance of plans for coordinating and minimizing the periods when the facility is unavailable for use. When problems occur it is the responsibility of the Contractor to ensure that the correct procedures are applied and that excessive downtime triggers the appropriate response.

The Contractor will be responsible to plan the appropriate resources to support the design, development, integration, testing and execution of experiments, and produce required deliverables necessary to provide the researcher with the pilot evaluations and supporting data (and/or other deliverables, e.g., hardware), specified by research requirements defined in task orders. These include resources supplied by NASA, identified in the CTO, consistent with the high-level planning conducted by NASA management. In addition, the Contractor shall conduct discrete projects, or portions of projects, as defined by NASA through task orders. These projects are aimed at enhancing the capabilities of the simulation laboratories or facilities.

The Contractor shall ensure the safety, quality, integrity and maintenance of simulators, facilities and Installation-Provided Property (IPP). In the event that a modification to existing simulator facilities impacts the safety of the test subject, the Contractor shall support in developing any analyses required to satisfy NASA's Human Occupancy Review Board safety requirements.

This Statement of Work (SOW) is organized to focus on the main purpose of the Simulation Facilities, namely the conduct of research experiments and discrete simulation technology projects. Section 3.1 is dedicated to specific phases in the experiment cycle. Section 3.2 addresses the requirements associated with the performance of discrete tasks such as facility repair or simulation technology enhancements. Section 3.3 addresses the requirements of preventive and corrective maintenance. Section 3.4 addresses the functional capabilities necessary to meet the requirements in section 3.1, 3.2 and 3.3. Section 3.5 addresses additional functions such as administration, documentation, configuration management, outreach, environmental compliance, Safety, Environmental, and Mission Assurance (SEMA), and property management. While these supporting functions may not address the design, planning, preparation, conduct and data acquisition/reduction related to specific simulations or projects, each plays a vital role in facilitating the success of these activities.

## 3.0 Requirements

## 3.1 Experiments

The successful performance of aerospace simulation experiments is one of the primary functions of the facilities. The process cycle for a successful simulation includes planning, preparation, operations and post-operation activities. The Contractor shall use the functional capabilities defined in section 3.4, as necessary to achieve the goals of each experiment. The specific requirements which apply to each of these phases are given below.

### 3.1.1 Experiment Planning

Experiment planning focuses on the development of the technical and project management approaches, technical objectives, performance incentives, risk allocation, and performance metrics with a focus on identifying key actions/ deliverables to be used to assess the success (or failure) of contractor performance. As necessary to meet the requirements of authorizing CTOs the Contractor shall:

- Define, develop, operate and maintain an experiment resource control system, which will track the experiment schedule, finances and configuration for each specific project/simulation.

- Generate an Experiment Implementation Plan (EIP) which outlines the Contractor's approach to the technical objectives throughout the preparation, operations and post-operations phases. The EIP shall require Government approval. The EIP shall:

  - Define the tasks necessary to perform the experiment, the associated resources, schedule and budget.
  - Address special matters pertaining to Safety, Environmental, and Mission Assurance (SEMA), environmental compliance, configuration management, maintenance, facilities integrity, and IPP.
  - Address any known technical and cost risks appendant to the Contractor's proposed approach.
  - Define the Contractor's approach in refining the simulation requirements necessary to meet the research objectives.

### 3.1.2   Experiment Preparation

With the planning phase complete, preparation for the experiment is required. While the extent, complexity and duration of preparation activities will vary from experiment to experiment, for a nominal experiment, hardware, systems software, applications programming, electrical, electronic and mechanical development will be required in order to prepare all facets of an experiment. This phase includes all activities from completion of project-specific planning to the beginning of the actual experiment.

Experiment preparation shall be implemented in accordance with the approved EIP. As part of the preparation for an experiment, the Contractor shall meet the following specific requirements:

3.1.2.1   The Contractor shall generate experiment operations plans and procedures, along with foreseeable contingencies, as described in the EIP.

3.1.2.2   The Contractor shall complete the design, development, fabrication, installation, integration and checkout of all mechanical, electrical and hardware systems necessary for the performance of the experiment.

3.1.2.3   The Contractor shall complete the development of specialized systems software necessary for the performance of the experiment.

3.1.2.4   The Contractor shall perform application programming, database modeling and graphics to complete the design, development, modification, installation, checkout and documentation necessary for the performance of the experiment.

3.1.2.5   The Contractor shall advise the experimenters on the development of realistic flight scenarios, including possible events, malfunctions, etc. and airspace operations needed for the performance of the experiment. This may include training on the use of simulators, ATC operations or airport procedures needed for the performance of the experiment.

3.1.2.6     The Contractor shall develop the data collection process to support the experiment, including, but not limited to, the definition of the parameters, data rate and volume, and data format.

3.1.2.7     The Contractor shall integrate the laboratory control system to the motion simulator, cab and associated hardware, as required.

### 3.1.3    Experiment Operations

The operations phase is the period of activities which occur from the start of the actual simulation experiment through its completion. This is the period where pilots evaluate the aircraft and/or scenario; ATC personnel evaluate the ATC simulation; or, where airport design personnel evaluate the characteristics of the tower simulation and data is collected and stored.

Simulation experiment operations shall be implemented in accordance with the approved EIP. As part of the operations of a simulation experiment, the Contractor shall meet the following specific requirements:

3.1.3.1     The Contractor shall operate simulation experiments in accordance with written plans/procedures, and shall provide the flexibility to modify experiment parameters contingent upon interim experiment results.

3.1.3.2     The Contractor shall ensure integrity of the simulators prior to each day's experiment runs. The contractor shall be responsible for documenting the setup, operation, and performance of each simulation in a consistent format.

3.1.3.3     The Contractor shall conduct training and flight operations support (i.e., air traffic communications and functionality) necessary for flight crews participating in experiment runs.

3.1.3.4     The Contractor shall train the crews/experimenters on operations needed for the performance of the experiment, including, but not limited to, the conduct of safety briefings, and the conduct of system familiarization briefings.

3.1.3.5     The Contractor shall conduct data collection, verification and any post-processing required for each experiment.

3.1.3.6     The Contractor shall record system discrepancies and ensure that they are resolved in compliance with NASA guidelines. The Contractor shall also log changes in systems status for each simulation conducted (e.g., electrical/electronic, mechanical, hardware/software, spares, etc.)

3.1.3.7     The Contractor shall recruit pseudo-pilots and pseudo controllers for air traffic simulation and conduct training for the air traffic operations support, as required to meet the specific research requirements.

### 3.1.4    Post-Experiment Operations

Subsequent to experiment completion, all documentation, post-experiment briefings and other deliverables shall be completed.

Simulation post-experiment operations shall be implemented in accordance with the approved EIP. As part of the post-experiment operations of a simulation experiment, the Contractor shall meet the following specific requirements.

3.1.4.1    The Contractor shall provide required outputs in accordance with simulation requirements, which may include but are not limited to:

- Data distribution and analysis per the EIP
- Project summary report including documentation of all modifications made to equipment to support the experiment.

3.1.4.2    The Contractor shall recommend what simulation hardware/software/data to retain for future use/reference and shall capture the configuration to ensure that the simulation can be repeated at a future time.

3.1.4.3    The Contractor shall record lessons learned and update the current project book or work file, a copy of which goes in the SimLabs libraries.

3.1.4.4    The Contractor shall support the NASA post-experiment briefing to review the conduct and results of the experiment.

## 3.2    Discrete Projects

Individual work orders will be generated by NASA for discrete tasks and projects outside the bounds of simulation experiments, maintenance, and routine support functions. Such tasks may include proof of concept, demonstrations, facility refurbishment or upgrade, or other facility tasks. As with the experiment activities of section 3.1, discrete projects are expected to follow the standard process cycle including planning, preparation, implementation and post-implementation activities, meeting the same requirements delineated in section 3.1.
The Contractor shall use the functional capabilities defined in section 3.4, as necessary, to achieve the goals of each discrete task or project.

Discrete projects encompass analyses, design, acquisition, modification, installation, and checkout of electronic laboratory equipment, system software, graphics, flight hardware systems, structural modifications to simulation systems and facilities; and development and fabrication of simulation mechanical systems.

The contractor shall be responsible for analysis and recommendation of solutions in the above-mentioned areas which may lead to acquisition of off-the-shelf solutions or in-house development and modifications. Follow-on activities shall include appropriate system level installation and checkout of these solutions.

## 3.3    Maintenance

The maintenance of each facility is significantly more complex than that for standard training simulators. The research and development nature of SimLabs mandates hardware that can readily be reconfigured for different projects. The hardware is often reconfigured to adapt to the large-scale transport aircraft for a given study and a vertical takeoff vehicle for the next.

As necessary, the Contractor shall use the functional capabilities defined in section 3.4 to accomplish the maintenance requirements.

### 3.3.1 Preventive Maintenance

, As necessary to meet the requirements of authorizing CTOs:

3.3.1.1    The Contractor shall provide all services necessary to maintain the simulation facilities.

3.3.1.2    The Contractor shall provide spare parts sufficient to support routine maintenance/anticipated failures, and tools required to maintain simulator equipment, unless provided by NASA.

3.3.1.3    The Contractor shall prepare and implement preventive maintenance plans for the equipment listed in Attachment J.1(a)3.

3.3.1.4    The Contractor shall prepare and implement a preventative maintenance plan schedule for the Simulation Laboratory Facilities to minimize system downtime. The Simulation Laboratory Facilities are comprised of the equipment listed in Attachments J.1(a)3.

3.3.1.5    The Contractor shall perform functions to ensure proper maintenance of facility systems, including but not limited to:

- Provide mechanical maintenance in accordance with Simulation Facility Operations Manuals, Manufacturer's service information and standard industry practices.
- Clean, lubricate, service, adjust, and tune the simulators, to support simulation schedules.
- Maintain analog and digital systems with associated peripherals, networks and interfaces.
- Maintain simulation lab hardware, such as simulation engineers control station/workstations, strip-chart recorders, X-Y plotters, and audio/video recording equipment for data collection purposes.
- Maintain visual and graphics generation systems such as computer-generated out-the-window imagery equipment, special symbology generators, and graphics workstations.
- Maintain visual and graphics presentation systems, such as high resolution CRT's, projectors, head-up-displays (HUDs), and video switching systems.
- Maintain control loaders and hydraulic power units.
- Maintain communications and audio systems such as aircraft sound systems, and voice input/output systems.
- Maintain aircraft instruments.

3.3.1.6    The Contractor shall perform the following functions to ensure proper maintenance of systems software:

- Maintain, integrate, test and install software for each computer system
- Maintain documentation for these systems.
- Coordinate with operational SimLabs groups to achieve required system performance.

- Incorporate modifications to solve reported problems/incorporate and document.
- Perform system backups as necessary approved design changes
- Test and report on all new/modified systems software (accept/reject).
- Archive software and associated documentation.
- Perform system/subsystem testing, diagnostics, and reporting on new hardware.
- Provide programming and software capabilities assistance to systems users.

### 3.3.2   Corrective Maintenance

Individual work orders will be generated for corrective maintenance outside the bounds of simulation experiments, discrete projects, or routine support functions. As with the experiment activities and discrete projects of sections 3.1 and 3.2, corrective maintenance tasks are expected to follow the standard process cycle. This includes planning, preparation, implementation and post-implementation activities, meeting the same requirements delineated in section 3.1, although in an expedited fashion in that corrective maintenance tasks are likely to be time critical.

### 3.4   Functional Capabilities

The Contractor shall provide the following functional capabilities in order to meet the requirements in section 3.1, 3.2 and 3.3 of this SOW. The degree to which each of these capabilities will be called upon will be dependent upon the specific task orders generated.

### 3.4.1   Systems Engineering

As necessary to meet the requirements of authorizing CTOs, the Contractor shall provide system engineering services to ensure the continuing operation and evolutionary improvement of the simulation facilities which may include, but is not limited to:

- Definition and development of facilities upgrades and capabilities, including development of new simulators. This may include providing structural modifications to existing systems and facilities, performing systems analyses and conceiving designs for simulator systems/subsystems, and providing the implementation planning, integration and testing for new simulation systems.
- Design, development, and integration of advanced technology into simulation systems (i.e., advanced controls/displays). This may also include developing advanced engineering techniques to improve fidelity/validity of simulations.
- Performance of systems analyses and provision of recommendations for redesign of software and hardware systems including networks.

### 3.4.2   Systems Software & Systems Administration

As necessary to meet the requirements of authorizing CTOs, the Contractor shall:

- Provide and execute specialized systems software including real-time schedulers, debug packages, program development tools, input/output routines, special device handlers, networks, and hardware diagnostics.
- Provide and execute data reduction software.
- Perform systems analysis and provide recommendations for redesign of systems software.
- Perform coordination of all systems software development with simulation engineering (see Section 6.0).
- Train and consult with system users regarding new hardware/software.
- Provide requirements and specification studies.
- Maintain current system configuration control library, including subcontractor supplied software and equipment.
- Implement a system of programming standards, design, coding, and documentation methods.
- Perform system backups as necessary.
- Provide manuals and other documents, including those for training.

### 3.4.3   Aerospace Engineering and Applications Programming

The Contractor shall perform aerospace engineering and applications programming to complete the design, development, modification, installation, checkout and documentation of all real-time models (e.g., models of advanced and existing aircraft for real-time computation) necessary to meet CTO requirements, which may include, but is not limited to:

- Ground reactions and ground handling models
- Primary and secondary flight control systems
- Auto flight systems
- Avionics systems
- Propulsion systems
- Fuel system
- Hydraulic systems
- On-board auxiliary systems
- Air conditioning/pressurization systems
- Navigation systems programs
- Detection/communication systems
- Maintenance or creation of new navigational data bases (terrain profiles, radio facilities, etc.)
- Development and modification of advanced aircraft models and air traffic control management for real-time computation
- Determination of methods to provide effective visual/motion cues to simulator pilots
- Scenario development

### 3.4.4   Graphics Programming

As necessary to meet the requirements of authorizing CTOs, the Contractor shall complete the design, development, modification, installation, checkout and documentation of all graphics, text and display software, which may include, but is not limited to:

- Creation and maintenance of real-time graphics software based on simulation requirements. This may include the integration of advanced controls/display technology into simulation systems or the modification or creation of new air traffic control simulation displays.
- Creation and maintenance of text and graphic displays for simulation heads-down and heads-up displays, and experimenter/researcher control pages.

### 3.4.5    Real-time Visual Displays/Visual Scene Models

As necessary to meet the requirements of authorizing CTOs, the Contractor shall create and maintain real-time visual scene databases and visual scene models. Visual scene models are either vendor supplied, modified from a previous model or developed in-house. The programs that create or modify the databases have also been provided by vendors or have been developed in-house.

### 3.4.6    Hardware and Mechanical Systems Engineering

Hardware and mechanical systems can be separate systems or several sub-systems interconnected as a larger system. As necessary to meet the requirements of authorizing CTOs, the Contractor shall:

- Design, fabricate, modify, assemble, and integrate hardware and equipment for simulation research operations and discrete projects. Tasks may include fabrication of original equipment from design drawings or sketches and/or modification or changes to existing hardware and systems including but not limited to cab instrument panels and consoles, floor panels, seats, visual display support structures, sheet metal assemblies, pilot control devices such as sticks, grips, surface controls, and power management mechanisms.
- Design, develop, maintain, operate, and modify simulation mechanical, hydraulic, electrical/electronic, and servo systems.
- Provide structural modifications to systems and facilities.
- Design, fabricate or modify electronic chassis, assemblies and subassemblies, and cables using wire wrap, termi-point, soldering, and potting techniques.
- Develop/maintain equipment operations and maintenance logs for usage/configuration and availability, including discrepancy reports.
- Understand/manage diverse hardware/software environment.
- Provide integration of new hardware systems.

### 3.4.7    Aviation System Operations

As necessary to meet the requirements of authorizing CTOs, the Contractor shall operate and evaluate the performance of the facility, including providing pilot and ATC expertise to help develop and test experiment scenarios and conduct flight system operations training.

### 3.5    Additional Functions

The successful long-term performance of the simulation facilities is dependent on efficient and effective on-going additional functions. These additional functions,

further defined below, provide the logistics and infrastructure necessary to keep the facilities operating.

### 3.5.1    Management/Administration

The Contractor shall provide an overall management and administrative function to ensure that the proper resources are available and allocated, that adequate reports and documentation are prepared, and that the overall environment supports the experiment requirements. The Contractor shall provide for overall management and administrative functions to meet the requirements.

3.5.1.1    The Contractor shall manage the contract in a fiscally responsible manner. The Contractor shall seek, and recommend to NASA, opportunities to operate more efficiently or at lower cost while meeting all other requirements.

3.5.1.2    The Contractor shall provide a well-defined, stable organizational structure with clear lines of authority and clearly identified Government interfaces.

3.5.1.3    The Contractor shall ensure the facilities are available for scheduled simulation experiments. All work areas will work shifts depending upon facility, simulation, maintenance, and development schedules and/or availability of laboratory and facility equipment.

3.5.1.4    The Contractor shall manage the contract resources allocated by NASA for specific projects in a manner to ensure experiments are performed in accordance with published schedules.

3.5.1.5    The Contractor shall provide supply and service acquisition for system requirements in accordance with its own purchasing procedures, as approved by the Government.

3.5.1.6    The Contractor shall prepare and implement a discrepancy reporting and tracking system.

3.5.1.7    The Contractor shall provide a monthly report of the state of the facilities, identifying risks and critical issues.

3.5.1.8    The Contractor shall maintain and update current plans and procedures to ensure the facilities consistently meet requirements. Plans and procedures that currently exist will be made available to the contractor and may be used to assist in the fulfillment of this requirement.

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

### 3.5.2 Outreach

SimLabs primarily exists to support NASA programs. SimLabs' mission is to research, advance and transfer scientific simulation knowledge and understanding. In addition, as NASA programmatic commitments will allow, facility time can be made available for other Government agencies, Academia

and Private Industry to perform simulation-based projects that will enhance facility operations and/or exploit the unique capabilities of the SimLabs' facilities.

3.5.2.1     Directed Outreach. The Contractor shall support the Government's analysis of program requirements and shall support the outreach efforts of the Government to provide information regarding SimLabs' mission to potential users. This support shall include the maintenance of a contact database of current and potential SimLabs customers, support in developing Government proposals to potential users, tours of the SimLabs facilities, development of communication materials (including posters and brochures), maintenance of the SimLabs website, and support in promoting SimLabs facilities at professional conferences.

3.5.2.2     Non-Directed Outreach. Additionally, the Contractor shall bring to the attention of the SimLabs Government management staff any simulation related opportunities encountered through its own corporate outreach efforts. The Contractor should seek simulation opportunities that are related to the aerospace industry. After concurrence by the Contracting Officer (see clause H.15), the Contractor shall pursue the simulation opportunity with a goal of bringing the potential customer to the government to enter into an agreement to perform a simulation in the SimLabs' facilities.

### 3.5.3     Property Management

To ensure accountability for equipment and facilities, as provided and through any upgrades or repairs, the Contractor shall meet the requirements listed below:

3.5.3.1     The Contractor shall prepare, maintain, and implement a Property Management Plan which, at a minimum, will:

- Identify the objectives of the plan and how they will be fulfilled.
- Define the property management tasks that will be performed and their inter-relationships.
- Identify where Government-furnished logistics, forms and procedures will be used.

3.5.3.2     The Contractor shall develop and implement procedures for maintaining within-facility stock of materials/spares, and maintain current database inventory documentation.

### 3.5.4     Safety, Environmental, and Mission Assurance (SEMA)

The Contractor shall develop, maintain, and implement a comprehensive Risk Management Plan addressing at least Technical, Cost, Schedule, Safety, and Security risks.

To ensure the facilities are operated in a safe and reliable manner, with adequate quality controls, the Contractor shall meet the SEMA requirements listed below, as well as relevant NASA SEMA policies, procedures and guidelines.

### 3.5.4.1 Environmental Compliance

The Contractor shall identify and maintain records for all hazardous materials and obtain permits through the Ames Environmental Office in accordance with the Ames Environmental Procedures and Guidelines (APR 8800.3) and in coordination with the COTR. The Contractor shall comply with the applicable regulations included in Chapter 1 of the APR and the other applicable procedures and guidelines specified in the APR.

### 3.5.4.2 System Safety

The Contractor shall provide copies of valid certifications from vendors providing DOD or FAA parts or services.

The Contractor shall perform all tasks so as to provide for the protection of Human Research Subjects (NPR 7100.1).

The Contractor shall provide for Human Research Planning and Approval Guidelines in accordance with APR 7170.1. The Contractor shall be an active participant in the Government Industry Data Exchange Program (GIDEP). As necessary, projects including significant design, fabrication or modification to motion simulators and/or their equipment shall require review and approval through the Human Occupancy Review Board.

### 3.5.4.3 Occupational Safety

The Contractor shall be an active participant of Voluntary Protection Program (VPP) and comply with safety standards consistent with APG 1700.1 for all tasks under this contract.

The Contractor shall furnish appropriate safety equipment (safety glasses, shoes, ear protection, etc.) as required to protect personnel.

### 3.5.4.4 Reliability

The Contractor shall preserve and ensure facility (VMSC, FFC and CVSRF) integrity in terms of availability, reliability and maintainability such that facilities including all development systems and support equipment are operational and perform to requirements during scheduled operations.

### 3.5.4.5 Quality Assurance

The Aerospace Systems Division (Code AF) is required to maintain current up-to-date operational, safety, maintenance, quality etc. policies as dictated by the Ames Management System. The contractor shall be responsible for complying with and supporting all Ames Management policies, including AF Division policies, and provide for the integration of all procedures into the Management System. The AF Division policies can be found at: http://dqa.arc.nasa.gov/iso9000/CodeAF.htm

### 3.5.5    Configuration Management

To ensure the facilities are operated in a regular, consistent and known manner, that their performance levels are measured and recorded, that a historical record of activities are maintained, the Contractor shall meet the requirements listed below:

3.5.5.1    The Contractor shall establish, maintain and implement a configuration management plan in accordance with the Ames Management System, including AF Division policies.

3.5.5.2    The Contractor shall maintain the facilities' documentation libraries and ensure that they are current, accurate and complete, including but not limited to:

- All operating procedures and reference manuals.
- Records of measured system performance parameters.
- Documentation recording the performance of experiments including project notebooks/work files, significant repairs/upgrades and preventative maintenance records.
- Manufacturer's manuals, bulletins, parts lists, and vendor source lists.
- Facility configuration.

### 3.5.6    747-400 Flight Simulator Certification

The Contractor shall perform the following functions to ensure FAA Level D, or equivalent, Certification is maintained on the 747-400 flight simulator as determined by FAA on-site verification:

- Maintain all systems performance within FAA Level-D regulatory tolerances.
- Maintain all required certification documentation.
- Maintain test procedure manuals.
- Maintain test driver software.
- Acquire, set-up and operate certified test equipment.
- Conduct tests of simulator.

## 4.0    Metrics

As part of the response to the initiation of a NASA Contract Task Order (CTO)/Statement of Requirements (SOR), the Contractor shall recommend performance metrics/mission success criteria. NASA will monitor the Contractor's activities through the deliverable documentation specified in Attachment J.1(a)4, reports and reviews identified in the Contractor-generated EIP, customer questionnaires, and other means to be identified in the contract surveillance plan.

Metrics to be used include the performance of the required task on cost and schedule, maintaining the simulators in operational readiness, and the performance of all required experiments (including the acquisition of required data). The Contractor's performance as measured against these metrics and those included in the Award Fee/Term Performance Evaluation Plan (AFT PEP) will be used to determine the fee earned.

## 5.0    Abbreviations and Acronyms

| | |
|---|---|
| ACFS | Advanced Concepts Flight Simulator |
| AHB | Ames Handbook |
| APG | Ames Procedures and Guidelines |
| APD | Ames Policy Directive |
| APR | Ames Procedural Requirements |
| ARC | Ames Research Center |
| ATC | Air Traffic Control |
| COTR | Contracting Officer's Technical Representative |
| CTO | Contract Task Order |
| CVSRF | Crew-Vehicle Systems Research Facility |
| DOD | Department of Defense |
| EIP | Experiment Implementation Plan |
| FAA | Federal Aviation Administration |
| FAR | Federal Acquisition Regulations |
| FFC | FutureFlight Central |
| ICAB | Interchangeable Cab Simulator (Fixed Base Area) |
| IPP | Installation-Provided Property |
| NASA | National Aeronautics and Space Administration |
| NMI | NASA Management Instruction |
| NPR | NASA Procedural Requirements |
| QA | Quality Assurance |
| SOR | Statement of Requirements |
| SOW | Statement of Work |
| SEMA | Safety, Environmental, and Mission Assurance |
| V/STOL | Vertical/Short Takeoff and Landing |
| VMS | Vertical Motion Simulator |
| VMSC | Vertical Motion Simulator Complex |

## 6.0  Proprietary Software

The Contractor will be required to utilize and support all software included in Attachment J.1(a)(6).

[END OF SECTION]

## SECTION D - PACKAGING AND MARKING

D.1   CLAUSES INCORPORATED BY REFERENCE (FAR 52.252-2) (FEB 1998)

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    NOV 2004    PACKAGING, HANDLING, AND
TRANSPORTATION

(End of Clause)

[END OF SECTION]