

SECTION A
STANDARD FORM 1449

SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24 & 30				1. REQUISITION NUMBER 4200130653		PAGE 1 OF 1	
2. CONTRACT NO. NNK05LB04B		3. AWARD/EFFECTIVE DATE 9/15/05		4. ORDER NUMBER		5. SOLICITATION NUMBER RFP10-99-0021 Rev A	
6. SOLICITATION ISSUE DATE October 18, 1999		7. FOR SOLICITATION INFORMATION CALL:		a. NAME Edwin Martinez		b. TELEPHONE NUMBER (No collect calls) (321) 867-1699	
8. OFFER DUE DATE/LOCAL TIME 17 August 2005		9. ISSUED BY NASA John F. Kennedy Space Center Procurement Office, Mail Code: OP-LS Attn: Edwin Martinez Kennedy Space Center, Florida 32899		10. THIS ACQUISITION IS <input checked="" type="checkbox"/> UNRESTRICTED SET ASIDE: % FOR SMALL BUSINESS SMALL DISADVANTAGED BUSINESS 8(A) SIC: 3761 SIZE STANDARD: 1000		11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED <input type="checkbox"/> SEE SCHEDULE	
12. OFFER ACCEPTANCE PERIOD 30 Days from Date in Block 8		13A. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700)		13B. RATING DO-C9			
14. METHOD OF SOLICITATION <input type="checkbox"/> RFO <input type="checkbox"/> RFQ <input type="checkbox"/> IFB <input checked="" type="checkbox"/> RFP		15. DELIVER TO Same as Block 9.		16. ADMINISTERED BY Same as Block 9.			
17a. CONTRACTOR/OFFEROR Orbital Sciences Corporation 21839 Atlantic Boulevard (Bldg 1) Dulles, Virginia 20166 TELEPHONE NO. 703-406-5423		PPC/STATE CODE () () FACILITY CODE 10-191-6062		18a. PAYMENT WILL BE MADE BY CODE NASA Shared Services Center (NSSC) Financial Management Division (FMD) --- Accounts Payable/Bldg 1111, C. Road Stennis Space Center, MS 39529			
17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER		18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a. UNLESS BLOCK BELOW IS CHECKED SEE ADDENDUM					
19. ITEM NO.		20. SCHEDULE OF SUPPLIES/SERVICES		21. QUANTITY		22. UNIT	
		NASA LAUNCH SERVICES IN ACCORDANCE WITH SECTION B, C AND D.				23. UNIT PRICE	
						24. AMOUNT	
						ORIGINAL	
						(Attach Additional Sheets as Necessary)	
25. ACCOUNTING AND APPROPRIATION DATA				26. TOTAL AWARD AMOUNT (For Govt. Use Only)			
<input checked="" type="checkbox"/> 27a. SOLICITATION INCORPORATES IN FULL TEXT FAR 52.212-1, 52.212-4, FAR 52.212-3 & 52.212-5 ARE ATTACHED. ADDENDA <input checked="" type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED.							
<input checked="" type="checkbox"/> 27b. CONTRACT/PURCHASE ORDER INCORPORATES IN FULL TEXT FAR 52.212-4, FAR 52.212-5 IS ATTACHED. ADDENDA <input checked="" type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED.							
<input checked="" type="checkbox"/> 28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN 3 COPIES TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED HEREIN.				<input type="checkbox"/> 29. AWARD OF CONTRACT: REFERENCE OFFER DATED THE OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS:			
30a. SIGNATURE OF OFFEROR/CONTRACTOR <i>James H. Utter</i>		30b. NAME AND TITLE OF SIGNER (Type or print) James H. Utter Deputy General Manager, Business Operations		30c. DATE SIGNED 15 Aug 05		31a. UNITED STATES OF AMERICA (Signature of Contracting Officer) <i>Dudley R. Cannon, Jr.</i>	
				31b. NAME OF CONTRACTING OFFICER (Type or print) Dudley R. Cannon, Jr.		31c. DATE SIGNED 9-15-05	
32a. QUANTITY IN COLUMN 21 HAS BEEN <input type="checkbox"/> RECEIVED <input type="checkbox"/> INSPECTED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO THE CONTRACT, EXCEPT AS NOTED				33. SHIP NUMBER <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL		34. VOUCHER NUMBER	
32b. SIGNATURE OF AUTHORIZED GOVT. REPRESENTATIVE				32c. DATE		35. AMOUNT VERIFIED CORRECT FOR	
36. PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL				37. CHECK NUMBER			
38. S/R ACCOUNT NO.				39. S/R VOUCHER NO.		40. PAID BY	
CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT				42a. RECEIVED BY (Print)			
SIGNATURE AND TITLE OF CERTIFYING OFFICER				41c. DATE		42b. RECEIVED AT (Location)	
				42c. DATE REC'D (YY/MM/DD)		42d. TOT. CONTAINERS	

SECTION B

STANDARD FORM 1449 CONTINUATION

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SECTION B

STANDARD FORM 1449 CONTINUATION

1.0 SCHEDULE OF SUPPLIES AND/OR SERVICES TO BE PROVIDED

The Contractor shall provide all services, facilities, and resources (except as may be expressly stated in this contract as furnished by the Government) necessary to furnish the Contract Line Item Number (CLIN) items (Tables B-4 through B-12) in accordance with the Statement of Work (SOW), Exhibits, and Documents attached hereto.

1.1 Basic Contract Firm Launch Service Requirements

CLIN	Description of Supplies and Services	Qty	Unit	Unit Price \$	Total Amount (\$)
1 SubCLIN	Launch Service for NuSTAR	1	Service		
1A	Standard Launch Services and Standard Mission Integration in accordance with the Attachment D1A, and Section D, Exhibit 2	1	Lot	NSP	N/A
1B	Non-Standard Services included in CLIN 1 above and in accordance with Attachment D1A and Section D, Exhibit 3 1.23.2.3, Alt Launch Site (RTS) Equatorial Ferry Launch 1.9.1, Increased Capacity Payload-to-GSE Interface (40-pin Auxiliary Harness) 1.9.4 Enhanced Telemetry Capabilities – Payload Data 1.11.4 Additional Instrument Purge System(s) Up to T-0	1	Lot	NSP	N/A
1C	Known Mission Unique Hardware and Software Non-recurring Items Including (if necessary to meet S/C requirements) 1 Shock Ring and/or 1 shortened avionics system	1	Lot	NSP	N/A

Table B-1: NuSTAR Launch Service Task Order

1.2 Standard Launch Service and Non-Standard Services Firm and Option Mission Profile Matrix

For each proposed firm and option standard launch service CLIN, the launch vehicle configuration and associated non-standard services corresponding with the standard launch service are identified by an 'X' in the appropriate column and box. An asterisk (*) placed in the appropriate column and box designates those non-standard services that are included as part of the standard launch service. Finally, an 'N/A' in the appropriate column and box designates those non-standard services that are not applicable or not available for a specific launch vehicle configuration and CLIN.

LV CONFIGURATION	CLIN
	CLIN 1
Pegasus XL	X
Taurus 2110-Cat2	
Taurus 2210-Cat2	
Taurus 2110-Cat3	
Taurus 2210-Cat3	
Taurus 3110-Cat2	
Taurus 3210-Cat2	
Taurus 3110-Cat3	
Taurus 3210-Cat3	
NON-STANDARD SERVICE	
1.9.1, Increased Capacity Payload-to-GSE Interface (40-pin Auxiliary Harness)	*
1.9.4 Enhanced Telemetry Capabilities – Payload Data	*
1.11.4 Additional Instrument Purge System(s) Up to T-0	*
1.23.2.3, Alt Launch Site (RTS) Equatorial Ferry Launch	*

Table B-2: LV Configuration and Associated Non-Standard Service Matrix

1.3 Reserved

Table B-3: Reserved

1.4 Non-Standard Services Ordered Independently of a Defined Mission

The Government reserves the right to order non-standard services independently of Launch Service Task Order (LSTO) missions under this CLIN from the items listed in Table B-12. The Contracting Officer may order the services at any time by written notice to the Contractor from the effective date of the contract through calendar year 2010.

CLIN	Description of Supplies and Service	Qty	Unit	Unit Price (\$)	Total Amount (\$)
9	Non-Standard Services Ordered Independently of a Defined Mission	A/R	Service	See Table B-12	See Table B-12

Table B-4: Non-Standard Services Ordered Independently of a Defined Mission

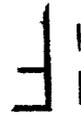
1.5 Special Task Assignments (Studies and Analyses)

CLIN	Description of Supplies and Service	Qty*	Unit	Unit Price (\$)	Total Amount (\$)
10	Special Task Assignments - Firm Fixed-Price Composite Labor Hours				
	See Section B, Clause 7.0 for definitized task assignments				

* Not to exceed 500,000 Cumulative Hours for Calendar Years 2004 through 2010

Table B-5: Special Task Assignments (Studies and Analyses)

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Table B-7: Hourly Labor Rate - NTE Price List

1.6 IDIQ Launch Service Task Order (LSTO)

The Government reserves the unilateral right to order launch services at any time from contract award through the second quarter of CY 2010 in accordance with contract Section C, Clause 14.0, Launch Service Task Ordering Procedures. These launch services are identified in Tables B-9 and B-10 and described in Exhibits 2 and 3 to the Statement of Work. NTE prices for launch services for IDIQ missions will be part of the price evaluation and best value selection for award of an IDIQ task order contract. IDIQ launch services for TBD missions represent potential requirements for launch services in addition to the firm and optional requirements for launch services awarded under previous NLS LSTOs.

IDIQ launch services for TBD missions represent potential requirements for launch services in addition to the firm and optional requirements for launch services awarded under previous NLS LSTOs.

In no event shall the Government be obligated to pay for any launch service prior to ATP and obligation of funds for that launch service. The minimum order quantity for NLS IDIQ contracts awarded in accordance with Section C, Clause 2.0, On-Ramp and Technology Insertion, is \$100,000.00. The maximum order quantity for this IDIQ contract portion is thirty (30) Launch Service Task Orders and associated non-standard services/mission unique services.

CLIN 11	Description of Supplies and Services	Qty	Unit	Unit Price (\$)	Total Amount (\$)
TBD	IDIQ Launch Service Task Order (LSTO)	TBD	Service	TBD	TBD
SubCLIN					
TBD	Standard Launch Services and Standard Mission Integration in accordance with the SOW and Exhibit 2	TBD	Lot	See Table B-9	
TBD	Non-Standard Services in accordance with the SOW and Exhibit 3	TBD	Lot	See Table B-10	
TBD	Known Mission Unique Hardware and Software Non-recurring Items in accordance with SOW Exhibit 6	TBD	Lot	TBD	

Table B-8: IDIQ Launch Service Task Order

1.7 NTE Prices - Standard Launch Services for IDIQ Missions

The Government shall have the right to order the standard launch services at the prices and for the launch vehicle configurations identified in Table B-9. Nothing in this clause precludes the Contractor from proposing more favorable prices or discount terms in response to specific requests for launch service proposals in accordance with contract Section C, Clause 14.0.

The table area is mostly blank with faint grid lines. A solid black square is located on the right side of the table area.

Table B-9: NTE Price List - Standard Launch Services for IDIQ Missions

Launch Vehicle Configuration from Table B-9 - PEGASUS XL (Aug05 Rev)							Vol. 1 Ref.
NON-STANDARD SERVICE ITEM	NOT TO EXCEED (NTE) PRICE (\$) IN CALENDAR YEAR ORDERED						
	2005	2006	2007	2008	2009	2010	

Table B-10 Pegasus: NTE Price List - Non-Standard Services for IDIQ Missions (Continued)

Launch Vehicle Configuration from Table B-9 - PEGASUS XL (Aug05 Rev)						
NON-STANDARD SERVICE ITEM	NOT TO EXCEED (NTE) PRICE (\$) IN CALENDAR YEAR ORDERED					
	2005	2006	2007	2008	2009	2010
						Vol. 1 Ref.

Table B-10 Pegasus: NTE Price List - Non-Standard Services for IDIQ Missions (Continued)

Launch Vehicle Configuration from Table B-9 - TAURUS - All Standard Service Configurations (Aug05 Rev)							
NON-STANDARD SERVICE ITEM	NOT TO EXCEED (NTE) PRICE (\$) IN CALENDAR YEAR ORDERED						
	2005	2006	2007	2008	2009	2010	Vol. 1 Ref.

Table B-10 Taurus: NTE Price List - Non-Standard Services for IDIQ Missions

Launch Vehicle Configuration from Table B-9 - TAURUS - All Standard Service Configurations (Aug05 Rev)							
NON-STANDARD SERVICE ITEM	NOT TO EXCEED (NTE) PRICE (\$) IN CALENDAR YEAR ORDERED						Vol, 1 Ref.
	2005	2006	2007	2008	2009	2010	
Launch Vehicle Configuration System for Generation Secondary Payload							E3B.7
							E3B.7.1

Launch Vehicle Configuration from Table B-9 - TAURUS - All Standard Service Configurations (Aug05 Rev)							
NON-STANDARD SERVICE ITEM	NOT TO EXCEED (NTE) PRICE (\$) IN CALENDAR YEAR ORDERED						
	2005	2006	2007	2008	2009	2010	
							Vol. 1 Ref.

Table B-10 Taurus: NTE Price List - Non-Standard Services for IDIQ Missions (Continued)

2.0 TOTAL AWARD AMOUNT

The total contract price at contract award is \$100,000.

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3.0 LAUNCH SERVICE FLEXIBILITY

3.1 General

The Government reserves the unilateral right, at any time, to substitute payloads, as well as to substitute standard launch services and/or add/delete non-standard services thereto, for any mission awarded to the contractor under this contract. Substitution of those standard launch services identified in Table B-11, or addition/deletion of those non-standard services identified in Table B-12 shall be accomplished in accordance with contract clauses 3.1 and 3.2, respectively. Cost impacts resulting from payload substitution, substitution of standard launch services not listed in Table B-11 and/or additions/deletions of non-standard services not listed in Table B-12 shall be subject to the changes clause. Once payment begins on a qualified standard launch service and NASA Insight commences, the Government also reserves the right to approve any Contractor initiated substitution of the launch vehicle or reallocation of launch vehicle hardware designated for a NASA mission under this contract.

3.2 Standard Launch Service Substitutions

Prior to ATP, the Government has the unilateral right to substitute the standard launch services identified in Table B-11, at the prices stated therein, for the standard launch services identified for the IDIQ missions awarded to the Contractor (Table B-8). Any such substitution accomplished prior to ATP shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for substitutions made after ATP shall be subject to the changes clause.

LAUNCH VEHICLE CONFIGURATION	FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED			
	2004	2005	2006	2007
	N/A	N/A	N/A	N/A

Table B-11: FFP List for Standard Launch Services

3.3 Non-Standard Service Additions and Deletions

Prior to the "no-later-than ordering date," the Government has the unilateral right to add or delete the non-standard launch services identified in Table B-12, at the prices stated therein, for the non-standard launch services identified for the IDIQ missions awarded to the Contractor (Table B-8). Any such addition / deletion accomplished prior to the "no-later-than ordering date" shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for additions / deletions made after the "no later-than ordering date" shall be subject to the changes clause.

Launch Vehicle Configuration TBP From Table B-11								
FIRM FIXED PRICE (\$)								
IN CALENDAR YEAR ORDERED								
NON-STANDARD SERVICES PRICE LIST ITEM	2004	2005	2006	2007	2008	2009	2010	NSS Reference

Table B-12: FFP List for Non-Standard Services

4.0 MOST FAVORED CUSTOMER

The Contractor hereby certifies the CLIN prices for standard launch services (including standard mission integration) under this contract are no higher than the lowest price charged to any other commercial or U.S. Government customer for an equivalent launch service during the twelve (12) months both preceding and following contract award, option exercise, or placement of a launch service task order. The Government shall be entitled to a one-time reduction in contract price for each standard launch service failing to meet this certification. The price credit will be equal to the difference between the standard launch service price under this contract and the lower price awarded for an equivalent launch service.

5.0 IDIQ LAUNCH SERVICE AND PRICE UPDATES

Successful Offerors who receive NLS IDIQ contract awards may propose additional IDIQ NTE launch services and prices via the on-ramp and technology insertion clause, Section C, Clause 2.0. IDIQ contract holders will not be entitled to unilaterally adjust NTE prices or delete launch services already in the contract. Contractor initiated changes to the launch vehicle configuration, vendor, or design shall be subject to the launch vehicle qualification requirements of Section C, Clause 3.0. Contractor initiated changes to the launch vehicle configuration, vendor, or design, after mission ATP, shall be at no increase to the contract price and subject to the written approval of the Contracting Officer. New launch vehicle qualification plans and revisions to existing qualification plans may be proposed for inclusion into the contract when submitting Launch Service Proposals (LSPs) pursuant to Section C, Clause 14.0, and shall be subject to the written approval of the Contracting Officer.

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SECTION C

CONTRACT TERMS AND CONDITIONS

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CONTRACT TERMS AND CONDITIONS

1.0 FAR 52.212-4 CONTRACT TERMS AND CONDITIONS--COMMERCIAL ITEMS (OCT 2003) (TAILORED)

- (a) *Inspection/Acceptance.* Pursuant to FAR Subpart 12.402(b), FAR clause 52.246-11 Higher-Level Contract Quality Requirement (Feb 1999) shall govern and apply to this contract and is provided in full text in Section C, Clause 16.0. For launch service Contract Line Item Numbers (CLINs) prior to launch, the provisions of FAR clause 52.246-4 Inspection of Services—Fixed-Price (Aug 1996) shall govern and apply to this contract and is incorporated by reference under contract Section C, Clause 35.0. The Government reserves the right to perform in-process inspection or testing of any supplies or launch services tendered for acceptance prior to launch.

The Government will accept only those launch services that successfully deliver a separated and undamaged payload to the proper orbit conditions and insertion accuracies and do not exceed the environmental parameters stated in the Interface Control Document (ICD) except as otherwise provided in this contract. Acceptance of launch service CLINs shall be in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions. The Contractor shall only tender for acceptance those items conforming to the contract requirements. For launch services not conforming to the contract requirements, the sole remedy for partial mission success is the forfeiture of the final payment.*The sole remedy for a failed mission is the forfeiture of the final payment and the return of 15% of the launch service price as determined by the provisions of contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions. For supplies or services other than launch services, the Government will require repair or replacement of nonconforming supplies or re-performance of nonconforming services at no increase in contract price. For launch services, the Government must exercise its post-acceptance rights within the time specified in contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions. For supplies or services other than launch services, the Government must exercise its post-acceptance rights --

- (1) Within a reasonable time after the defect was discovered or should have been discovered; and
- (2) Before any substantial change occurs in the condition of the item, unless the change is due to the defect in the item.

- (b) *Assignment.* The Contractor or its assignee's rights to be paid amounts due as a result of performance of this contract, may be assigned to a bank, trust company, or other financing institution, including any Federal lending agency in accordance with the Assignment of Claims Act (31 U.S.C. 3727).
- (c) *Changes.* FAR clause 52.243-1 Changes - Fixed-Price (Aug 1987) Alt I (Apr 1984) is hereby incorporated by reference under contract Section C, Clause 35.0. The time requirement for proposal submission is increased from thirty (30) days to (60) sixty days.
- (d) *Disputes.* This contract is subject to the Contract Disputes Act of 1978, as amended (41 U.S.C. 601-613). Failure of the parties to this contract to reach agreement on any request for equitable adjustment, claim, appeal or action arising under or relating to this contract shall be a dispute to be resolved in accordance with the clause at FAR 52.233-1, Disputes (Dec 1998), incorporated herein by reference. The Contractor shall proceed diligently with performance of this contract, pending final resolution of any dispute arising under the contract.
- (e) *Definitions.* The clause at FAR 52.202-1, Definitions (May 2001), is incorporated herein by reference under contract Section C, Clause 35.0.
- (f) *Excusable delays.* The Contractor shall be liable for default unless nonperformance is caused by an occurrence beyond the reasonable control of the Contractor and without its fault or negligence such as, acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather, and delays of common carriers. The Contractor shall notify the Contracting Officer in writing as soon as it is reasonably possible after the commencement of any excusable delay, setting forth the full particulars in connection therewith, shall remedy such occurrence with all reasonable dispatch, and shall promptly give written notice to the Contracting Officer of the cessation of such occurrence. Excusable delays for launch delays by either party are identified and shall be resolved in accordance with contract Section C, Clause 19.0, Adjustments to Launch Schedule.
- (g) *Invoice.* The Contractor shall submit an original invoice and three copies (or electronic invoice, if authorized,) to the address designated in the contract to receive invoices. An invoice must include:
- (1) Name and address of the Contractor
 - (2) Invoice date
 - (3) Contract number, contract line item number, and, if applicable, the order number

- (4) Description, quantity, unit of measure, unit price and extended price of the items delivered
 - (5) Shipping number and date of shipment including the bill of lading number and weight of shipment if shipped on Government bill of lading
 - (6) Terms of any prompt payment discount offered
 - (7) Name and address of official to whom payment is to be sent
 - (8) Name, title, and phone number of person to be notified in event of defective invoice. Invoices will be handled in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) Circular A-125, Prompt Payment. Contractors are encouraged to assign an identification number to each invoice.
- (h) *Patent indemnity.* The Contractor shall indemnify the Government and its officers, employees and agents against liability, including costs, for actual or alleged direct or contributory infringement of, or inducement to infringe, any United States or foreign patent, trademark or copyright, arising out of the performance of this contract, provided the Contractor is reasonably notified of such claims and proceedings.
- (i) *Payment.* Payment shall be made for items accepted by the Government that have been delivered to the delivery destinations set forth in this contract. The Government will make payment in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) Circular A-125, Prompt Payment. If the Government makes payment by Electronic Funds Transfer (EFT), see 52.212-5(b) for the appropriate EFT clause. In connection with any discount offered for early payment, time shall be computed from the date of the invoice. For the purpose of computing the discount earned, payment shall be considered to have been made on the date which appears on the payment check or the specified payment date if an electronic funds transfer payment is made.
- (j) *Risk of loss.* Risk of loss of or damage to Government property under this contract will be governed by FAR clause 52.246-25 Limitation of Liability-- Services (Feb 1997) and is hereby incorporated by reference under contract Section C, Clause 35.0.
- (k) *Taxes.* The contract price includes all applicable federal, state, and local taxes and duties.
- (l) *Termination for the Government's convenience.* The Government reserves the right to terminate this contract, or any part hereof, for its sole

convenience subject to the terms of this contract specified in contract Section C, Clause 28.0, Advance Understanding Regarding Termination Settlement under FAR Clause 52.212-4(l).

- (m) *Termination for cause.* The Government may terminate this contract, or any part hereof, for cause in the event of any default by the Contractor, including failure to meet launch dates or maintain qualified launch vehicles, or if the Contractor fails to comply with any contract terms and conditions, or fails to provide the Government, upon request, with adequate assurances of future performance. In the event of termination for cause, the Government shall not be liable to the Contractor for any amount for supplies or services not accepted, including all launch service payments previously paid and all launch service payments remaining to be paid, the Contractor shall be liable to the Government for any and all rights and remedies provided by law. If it is determined that the Government improperly terminated this contract for default, such termination shall be deemed a termination for convenience.
- (n) *Title.* Unless otherwise specified in a Task Assignment, title to items furnished in conjunction with services under this contract shall remain with the Contractor. In accordance with 42 U.S.C. 2465d, NASA shall not take title to launch vehicles under contracts for launch services.
- (o) *Warranty.* Unless otherwise specified in a Task Assignment, the Contractor makes no warranty, express or implied, with respect to the services delivered or performed hereunder.
- (p) *Limitation of liability.* Except as provided for in paragraphs (a) and (j) above, the Contractor will not be liable to the Government for consequential damages resulting from any defect or deficiencies in accepted items.
- (q) *Other compliances.* The Contractor shall comply with all applicable Federal, State and local laws, executive orders, rules and regulations applicable to its performance under this contract.
- (r) *Compliance with laws unique to Government contracts.* The Contractor agrees to comply with 31 U.S.C. 1352 relating to limitations on the use of appropriated funds to influence certain Federal contracts; 18 U.S.C. 431 relating to officials not to benefit; 40 U.S.C. 327, *et seq.*, Contract Work Hours and Safety Standards Act; 41 U.S.C. 51-58, Anti-Kickback Act of 1986; 41 U.S.C. 265 and 10 U.S.C. 2409 relating to whistleblower protections; 49 U.S.C. 40118, Fly American; and 41 U.S.C. 423 relating to procurement integrity.

- (s) *Order of precedence.* Any inconsistencies in this solicitation or contract shall be resolved by giving precedence in the following order:
- (1) The schedule and description of supplies/services (Section B, C, and Statement of Work, excluding contract clauses incorporated by reference).
 - (2) The Assignments, Disputes, Payments, Invoice, Other Compliances, and Compliance with Laws Unique to Government Contracts paragraphs of this clause.
 - (3) The clause at FAR 52.212-5 (Section C, Clause 34.0).
 - (4) Addenda to this solicitation or contract, including any license agreements for computer software.
 - (5) Solicitation provisions if this is a solicitation.
 - (6) Other paragraphs of this clause.
 - (7) The Standard Form 1449.
 - (8) Contract clauses incorporated by reference.
 - (9) Other documents, exhibits, and attachments.
 - (10) The specification.

2.0 ON-RAMP AND TECHNOLOGY INSERTION

- 2.1 The purpose of the IDIQ on-ramp is to create an opportunity for new, emerging launch service providers and for incumbent launch service providers to introduce qualified launch vehicles not available at the time of the award of the initial contract and to compete for additional requirements not identified as firm or option requirements under the basic contract. The intent of the on-ramp is to foster competition for future requirements for launch services, not to re-compete existing firm and optional requirements awarded under the contract.
- 2.2 The parties mutually agree that the original solicitation, as revised, shall remain open during the life of this contract and that at any time subsequent to the award of the present contract, the Government may award additional contracts for IDIQ requirements. Each February and August during the life of this contract, or at any other time established via synopsis, the Government, will accept proposals from new launch service providers for IDIQ contracts and proposals from existing IDIQ contractors for additional launch services. If the Government issues a

solicitation notice, new launch service providers and current IDIQ contractors will be allowed to submit proposals, within the notice's stated response time. The minimum contract requirements, the technical acceptability standards, evaluation factors, solicitation terms and conditions, price reasonableness, and basis for award shall remain in full force and effect for each new proposal. Upon award of each additional contract, the Government shall notify all present Contractors of the award, and the new Contractor shall thenceforth be eligible to compete with all present Contractors for the award of IDIQ task orders.

2.3 Expansion of Performance Capabilities

NASA reserves the right to consider, in the future, expansion of the performance capabilities covered by the IDIQ portion of the NLS contract (either above or below those mission sets competed herein), by properly soliciting offers from all interested sources capable of meeting the requirements in the expanded performance capabilities.

2.4 Technology Insertion – Additional Launch Services Not Previously Proposed

Existing Contractors may submit proposals each February and August subsequent to award to update launch service prices and/or introduce new launch service capabilities, improvements, and technology upgrades. The Contractor may propose new or modified launch services consistent with the terms and conditions of this contract. New or modified vehicles will be qualified based on the requirements established by NPD 8610.7, ELV Risk Mitigation Policy for NASA-Owned and NASA-Sponsored Payloads and contract Section C, Clause 3.0, Launch Vehicle Qualification. Launch services must comply with all the conditions and requirements of the SOW.

2.5 The minimum order quantity for IDIQ contracts awarded in accordance with this On-Ramp Clause is \$100,000.

3.0 LAUNCH VEHICLE QUALIFICATION

3.1 Any launch vehicle configuration utilized by the Contractor to provide launch services under this contract must be qualified by NASA in accordance with NPD 8610.7, ELV Risk Mitigation Policy for NASA-Owned or NASA-Sponsored Payloads. Launch vehicle configuration qualification will be performed in accordance with Program Management Instruction (PMI) K-ELV-10.2 Rev B, Launch Vehicle Certification.

3.2 Qualification Criteria:

- (A) The Launch Service Provider (LSP) shall be a domestic LSP pursuant to Section 201 of Public Law 105-303, Commercial Space Act of 1998
- (B) The LSP must obtain an ISO 9001/2000 third party certification, from a registrar accredited by either the International Registrar of Certified Auditors (IRCA) or the Registrar Accreditation Board (RAB), for any corporation, corporate divisions, subsidiaries, joint ventures, partner(s) and/or any other business entity actually performing launch vehicle manufacturing, management, payload/launch vehicle integration, testing and launch.
- (C) For contract award of firm, option, and IDIQ launch services, the launch vehicle configuration must be qualified to the required payload risk category or the Contractor must provide a viable plan, subject to Government assessment and acceptance, to achieve all qualification requirements prior to launch. If a qualification plan (Attachment D1, Exhibit 7) is submitted, it shall be exempt from disclosure as provided under the FOIA.
- (D) Services under this contract will only include launch vehicles qualified to risk mitigation Category 2 and 3 in accordance with NPD 8610.7. The Contractor shall submit required documentation for NASA evaluation and determination of qualification category. NASA shall not bear any cost associated with the development of any LSP documentation required for the qualification of a launch vehicle configuration.
- (E) For Category 2 and 3 missions, the proposed launch vehicle configuration shall achieve one successful launch prior to formal notification of mission Authority to Proceed (ATP).
- (F) Prior to launch of the NASA payload, the proposed launch vehicle configuration shall be qualified to the required payload risk category.
- (G) NASA reserves the right to require that selected Category 3 payloads be launched only on launch vehicle configurations that have fourteen consecutive, successful launches of the launch vehicle configuration.
- (H) A launch vehicle qualified to a higher category is inherently qualified to launch payloads designated as a lower category (i.e., launch vehicles qualified to launch category 3 payloads are also qualified to launch category 1 and 2 payloads).
- (I) If no qualified launch vehicle configurations exist to meet specific mission requirements solicited under a NASA request for contract proposal, the Launch Service Program Office (LSPO) may elect to award or issue ATP of a

mission contingent on the launch vehicle configuration achieving qualification requirements tailored by NASA.

- 3.3 For new vehicles and upgraded or modified vehicle configurations, NASA may require additional technical insight into the design, manufacturing, testing, integration, and first launch of the effected systems and launch vehicle.
- 3.4 In the event of a launch failure of a qualified common vehicle configuration, the LSPO may participate in or perform a failure investigation/return-to-flight board to re-qualify the launch vehicle configuration to a particular risk mitigation qualification category.

4.0 OFF-RAMP CLAUSE

- 4.1 The Government intends to award LSTO missions contingent upon one successful launch of the proposed vehicle prior to ATP and launch vehicle qualification prior to launch of the NASA mission.
- 4.2 ATP is formal written direction from the Contracting Officer that will typically occur at L-27 months before launch. Prior to ATP, the Government will perform an assessment of the Contractor's current plan to achieve launch vehicle qualification prior to launch of the NASA mission. In the event qualification does not occur prior to L-12 months, the Government will perform an additional assessment of the current qualification plan. If the Government determines the launch vehicle will not obtain qualification prior to launch of the NASA mission, the Government retains the right to invoke the remedies described in paragraphs 4.3 and 4.4 of this clause.
- 4.3 In the event the Government determines the launch vehicle will not be qualified by launch based on its L-12 month assessment, or the launch vehicle configuration loses qualification status after ATP, the Government may withhold payment, and/or delay the launch date and payment schedule until launch vehicle re-qualification at no increase in price, or terminate the launch service for cause pursuant to contract Section C, Clause 1.0(m) Termination for cause. In the event the Government delays the launch date and payment schedule, the Contractor shall be liable for liquidated damages for the length of delay as established by contract Section C, Clause 19.0, Adjustments to Launch Schedule. This clause shall also apply to any launch service awarded via LSTOs in fulfillment of IDIQ contract requirements.
- 4.4 The Contracting Officer shall send a cure notice prior to terminating a contract for cause. The Government's rights after a termination for cause shall include all the remedies available to the Government under the Termination for Cause of FAR 52.212-4(m). The Government's preferred remedy will be to acquire similar items from another Contractor and to charge the defaulted Contractor with any excess re-procurement costs together with any incidental or consequential damages

incurred because of the termination. When a termination for cause is appropriate, the Contracting Officer shall send the Contractor a written notification regarding the termination. At a minimum, this notification shall:

- (A) Indicate the contract is terminated for cause
- (B) Specify the reasons for the termination
- (C) Indicate which remedies the Government intends to seek or provide a date by which the Government will inform the Contractor of the remedy
- (D) State that the notice constitutes a final decision of the Contracting Officer and that the Contractor has the right to appeal under the Disputes clause.

5.0 LAUNCH SERVICE PAYMENTS, MILESTONE EVENTS AND COMPLETION CRITERIA

- 5.1 The Contracting Officer will inform the Contractor of ATP with the launch service via written direction. ATP is independent of contract award, option exercise, or launch service task order award. The Government is not obligated to pay the Contractor for any launch service activity prior to the Contracting Officer's written notification of ATP.
- 5.2 Upon successful completion of a milestone event and submission of a properly certified invoice, the Contractor may request commercial interim payments. The commercial interim payments will be paid in accordance with the payment schedule shown in Table C-1 and based on the milestone events identified in the contract Work Plan (Attachment D8).
- 5.3 Commercial interim payments are contract financing payments that are not payment for accepted items. Commercial interim payments are fully recoverable, in the same manner as progress payments, in the event of default. Commercial interim payments are contract financing payments and, therefore, are not subject to the interest-penalty provisions of prompt payment. However, these payments shall be made in accordance with the Agency's policy for prompt payment of contract financing payments. In accordance with 42 U.S.C. 2465d, NASA shall not take title to launch vehicles under contract for launch services.
- 5.4 In the event an option is exercised or an LSTO is issued less than twenty-four months prior to launch, the initial payment for such launch service will be the cumulative total of all payments that would have been paid if the option had been exercised or the LSTO had been issued at L-27 months. If a non-standard "call-up" service is ordered when an option is exercised or an LSTO is issued, the initial payment shall include the catalog price adjustment. If no "call-up" service exists, the initial payment shall be subject to equitable adjustment.

- 5.5 Scheduled dates in Table C-1 are tentative and represent invoice submission dates. Payment schedules may be deferred or canceled by the Government if the Contractor fails to make substantial progress in accomplishing the major launch service milestone events in the attached contract Work Plan. Payments falling due in the first quarter of each fiscal year (October - December) shall be paid promptly to the maximum extent practicable, but shall not be considered late until January 31 of the following calendar year.
- 5.6 In the event launch service SubCLINs are terminated independently of standard launch service CLINs, the parties mutually agree the same termination refund schedule percentage(s) shall be used and applied against the price for the terminated SubCLIN. Table C-1 milestone events shall apply to each firm and optional launch service and IDIQ LSTO issued under this contract.
- 5.7 This paragraph will apply to any postponement declared by the Government or the Contractor for any reason, including launch schedule adjustments and Contractor failure to make substantial progress in accordance with launch service milestone events (as determined by the Government under this clause). In the event of a launch schedule adjustment by the Government or Contractor in accordance with contract Section C, Clause 19.0, Adjustments to Launch Schedule, the payment schedule for the applicable launch service CLINs and SubCLINs shall be postponed for the length of the delay, if necessary, by the Government to correspond with the new launch date and the milestone events in the attached Work Plan. The requirement to make substantial progress in general conformance with the attached Work Plan, however, is not waived for any postponed launch service. In the event of a launch schedule adjustment by the Government or Contractor, the Government or Contractor shall be entitled to an equitable adjustment as determined by the contract Section C, Clause 19.0, Adjustments to Launch Schedule.
- 5.8 The Contractor agrees in the event of a termination of this contract pursuant to contract Section C, Clause 28.0, Advance Understanding Regarding Termination Settlement Under FAR Clause 52.212-4(l), the Government shall not be obligated in any event to pay or reimburse the Contractor any amount in excess of the amount already obligated to the contract. The Contractor shall not be obligated to continue performance of the work beyond such point. The Government shall not be obligated in any event to pay or reimburse the Contractor in excess of the amount obligated to the contract on a quarterly basis, notwithstanding anything to the contrary in contract Section C, Clause 28.0, Advance Understanding Regarding Termination Settlement Under FAR 52.212-4(l) and NFS 1852.232-77 Limitation of Funds (Fixed-Price Contract) (Mar 1989).

Launch Service Payment Schedule				
Milestone/ Commercial Interim Payment No.	Payment(s) Months Before Launch ¹ <i>Offerors to insert additional column to the left containing invoice submission dates.</i>	Amount (% of Launch Service CLIN Price)	Cumulative Amount of Launch Service Payments (\$) <i>Offerors to insert addition column to the left containing individual dollar amounts</i>	Termination for Convenience of the Government Repayment Schedule – Percentage (%) of Cumulative Payments Made to Date to be Returned to Government
1	L-27	10	TBP	50
2	L-24	10	TBP	50
3	L-21	10	TBP	50
4	L-18	10	TBP	55
5	L-15	10	TBP	55
6	L-12	10	TBP	55
7	L-09	10	TBP	60
8	L-06	10	TBP	60
9	L-03	10	TBP	60
10	Launch ²	10	TBP	0

¹ The Government reserves the right to extend or shorten the above payment schedule by plus or minus three months (i.e., L-30 or L-24) at no increase in contract value to accommodate mission specific requirements. The additional L-30 payment, if required, will be 9% of the launch service price and the next nine payments will be reduced by 1% from 10% to 9%. The Launch payment shall remain unchanged at 10%. In the event the first payment is made at L-24, the first payment shall be 20% of the launch service price.

² The Contracting Officer will either approve the final payment within fifteen days after receipt of the final flight report, DRD C4-13 or withhold the final payment in accordance with the provisions of contract Section C, Clause 24.0. No final payment shall be made in event of partial mission success or failed mission determination by the Government in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions. In the event of a partial mission success or failed mission, the final payment shall be forfeited by the Contractor and is not recoupable. In the event of a failed mission determination, 15% of the launch service price shall be applied as a credit to another launch service or be returned to the Government if it cannot be applied to a subsequent launch service. If funds are not credited or returned within thirty days of a failed mission determination, the funds shall be subject to interest penalties at the prevailing U.S. Treasury interest rate established for Prompt Payment.

Table C-1 Launch Service Payment Schedule

The Contracting Officer will either approve the final payment within fifteen days after receipt of the final flight report, DRD C4-13 or withhold the final payment in accordance with the provisions of contract Section C, Clause 24.0. No final payment shall be made in event of partial mission success or failed mission determination by the Government in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions. In the event of a partial mission success or failed mission, the final payment shall be forfeited by the Contractor and is not recoupable. In the event of a failed mission determination, 15% of the launch service price shall be applied as a credit to another launch service or be returned to the Government if it cannot be applied to a subsequent launch service. If funds are not credited or returned within thirty days of a failed mission determination, the funds shall be subject to interest penalties at the prevailing U.S. Treasury interest rate established for Prompt Payment.

Table C-1.1: CLIN 1 (NuSTAR) Launch Service Payment Schedule

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

**6.0 NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)**

- (a) The sum of \$4,569,897 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(l) "Termination for the Government's convenience" notwithstanding.
- (c) (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until November 15, 2009.
(2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at which, if the contract is terminated pursuant to contract Section C,

writing when within the next sixty (60) days the work will reach a point at which, if the contract is terminated pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to contract Section C, Clause 5.0 and Table C-1.

- (3) (i) The notice shall state the estimate when the point referred to in paragraph (c)(2) of this clause will be reached and the estimated amount of additional funds required to continue performance to the date specified in paragraph (c)(1) of this clause, or an agreed date substituted for it.
 - (ii) The Contractor shall, sixty (60) days in advance of the date specified in paragraph (c)(1) of this clause, or an agreed date substituted for it, advise the Contracting Officer in writing as to the estimated amount of additional funds required for the timely performance of the contract for a further period as may be specified in the contract or otherwise agreed to by the parties.
- (4) If, after the notification referred to in paragraph (c)(3)(ii) of this clause, additional funds are not allotted by the date specified in paragraph (c)(1) of this clause, or an agreed date substituted for it, the Contracting Officer shall, upon the Contractor's written request, terminate this contract on that date or on the date set forth in the request, whichever is later, pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience".
- (d) When additional funds are allotted from time to time for continued performance of the work under this contract, the parties shall agree on the applicable period of contract performance to be covered by these funds. The provisions of paragraphs (b) and (c) of this clause shall apply to these additional allotted funds and the substituted date pertaining to them, and the contract shall be modified accordingly.
 - (e) If, solely by reason of the Government's failure to allot additional funds in amounts sufficient for the timely performance of this contract, the Contractor incurs additional costs or is delayed in the performance of the work under this contract, and if additional funds are allotted, an equitable adjustment shall be made in the price(s) (including appropriate target, billing, and ceiling prices where applicable) of the items to be delivered, or in the time of delivery, or both.
 - (f) The Government may at any time before termination, and, with the consent of the Contractor, after notice of termination, allot additional funds for this contract.

- (g) The provisions of this clause with respect to termination shall in no way be deemed to limit the rights of the Government under the Termination for Cause clause of this contract. The provisions of this Limitation of Funds clause are limited to the work on and allotment of funds for the items set forth in paragraph (a) of this clause. This clause shall become inoperative upon the allotment of funds for the total price of said work except for rights and obligations then existing under this clause.
- (h) Nothing in this clause shall affect the right of the Government to terminate this contract pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract.

7.0 SECURITY FOR LAUNCH SERVICE PAYMENT FINANCING (APPLICABLE TO CLINs 1 THROUGH 10)

- 7.1 *Requirements for payment.* Payments will be made under this contract upon submission of properly certified invoices or vouchers by the Contractor to the NASA Shared Services Center. **A courtesy copy of such shall be submitted to the cognizant Contracting Officer on a concurrent basis, either by e-mail or hardcopy in order to facilitate the approval process.** The amount of all invoices or vouchers submitted shall not exceed the total contract price for all CLINs, authorized LSTOs issued under the IDIQ contract, and special task assignments (studies and analyses).
- 7.2 *Security.* Pursuant to FAR Subpart 32.202-4 Security for Government Financing and 10 U.S.C. 2307(f) and 41 U.S.C. 255(f), the Government is required to obtain adequate security for Government financing. Adequate security for payments made under this contract shall be required in the form of a preferred creditor's lien. The Contractor shall grant the Government a preferred creditor's lien i.e., a first lien paramount to all other liens against all work in process sufficient to recompense the Government for all monies advanced under this contract should the Contractor's performance prove to be materially unsatisfactory.
- 7.3 *Insurance.* The Contractor represents and warrants that it maintains with responsible insurance carriers (1) insurance on plant and equipment against fire and other hazards to the extent similar properties are usually insured by others operating plants and properties of similar character in the same general locality; (2) adequate insurance against liability on account of damage to persons or property; and (3) adequate insurance under all applicable workers' compensation laws. The Contractor agrees that, until work under this contract has been completed and all payments made under this contract have been liquidated, it will maintain this insurance and furnish any certificates with respect to its insurance that the administering office may require.

- 7.4 *Representations and Warranties.* The Contractor represents and warrants the following:
- (A) The balance sheet, the profit and loss statement, and any other supporting financial statements furnished to the administering office fairly reflect the financial condition of the Contractor at the date shown or the period covered, and there has been no subsequent materially adverse change in the financial condition of the Contractor.
 - (B) No litigation or criminal or civil proceedings are presently pending or threatened against the Contractor, which would jeopardize performance under this contract, except as shown in the financial statements.
 - (C) The Contractor has disclosed all contingent liabilities in the financial statements furnished to the administering office.
 - (D) None of the terms in this clause conflict with the authority under which the Contractor is doing business or with the provision of any existing indenture or agreement of the Contractor.
 - (E) The Contractor has the power to enter into this contract and accept payments, and has taken all necessary actions to authorize the acceptance under the terms of this contract.
 - (F) The assets of the Contractor are not subject to any lien or encumbrance of any character, which would jeopardize performance under this contract, except for current taxes not delinquent and except as shown in the financial statements. There is no current assignment of claims under any contract affected by these payment provisions.
 - (G) All information furnished by the Contractor to the administering office in connection with each request for payment is true and correct.
 - (H) These representations and warranties shall be continuing and shall be considered to have been repeated by the submission of each invoice for payments.
- 7.5 *Work Plan Submission.* The Contractor shall comply with the Work Plan that identifies the major milestone events and a corresponding narrative of the work activity necessary to accomplish the major milestone events.
- 8.0 **SCOPE OF WORK – SPECIAL TASK ASSIGNMENTS (STUDIES AND ANALYSES) (CLIN 10)**
- 8.1 It is contemplated the total hours in CLIN 10 will be allocated to launch services on an as-required basis. To accomplish this work, the Contractor shall perform

specific task assignments that will be defined through the issuance of task orders in accordance with contract Section C, Clause 9.0, Ordering Procedure and Payment for Special Task Assignments (Studies and Analyses) (CLIN 10) and paragraphs 8.2, 8.3, 8.4, and 8.5 herein.

- 8.2 In the performance of all Firm-Fixed-Price (FFP), completion-basis, non-LSTOs assigned under this contract, the Contractor may be required to expend a cumulative total of not more than 500,000 hours under CLIN 10 in support of east and west coast missions of fully burdened direct labor (which includes all direct and indirect cost and profit) at the FFP composite hourly labor rate stated in contract Section B, paragraph 1.5. Requirements for materials, subcontracted efforts, and hardware fabrication may be authorized and negotiated separately on a case-by-case basis by the Contracting Officer under individual task orders in addition to the FFP labor hours.
- 8.3 Only hours expended against specific written task orders authorized by the Contracting Officer shall be paid under this contract. Task orders shall be performed on an FFP, completion-effort basis. The Government is under no obligation to reimburse the Contractor for any costs, which exceed the maximum hours under CLIN 10 or the number of hours authorized on each task order.
- 8.4 The Government may require Special Task Assignments (Studies and Analyses) in any calendar year from 2005 through 2007 at the FFP composite labor rates identified in Section B, paragraph 1.5, and in any calendar year from 2008 through 2010 at the NTE prices identified Section B, paragraph 1.5, up to 500,000 hours of fully burdened labor (including all direct and indirect cost and profit).
- 8.5 The Contractor shall submit a price proposal update to convert NTE CY 2008-2010 labor rates into FFP labor rates at least 180 days prior to the end of CY 2007. The proposed labor rates shall be negotiated using the applicable procedures of FAR Part 15 and incorporated herein.

Task orders

9.0 ORDERING PROCEDURE AND PAYMENT FOR SPECIAL TASK ASSIGNMENTS (STUDIES AND ANALYSES) (CLIN 10)

- 9.1 Performance under this contract effort shall be subject to the following ordering procedure:
- (A) The Contractor shall incur hours under CLIN 10 of this contract only in the performance of task orders and revisions to task orders issued in accordance with this ordering procedure. No other costs or hours under CLIN 10 are authorized. Task orders shall be performed under an FFP completion-basis unless specifically authorized otherwise by the Contracting Officer.

- (B) During the term of this contract, task orders will be issued in writing by the Contracting Officer to the Contractor providing direction which fills in detail for specific work or otherwise completes the general description of the work within the scope of CLIN 10. Each task order will indicate the objective(s) and/or desired results of each special task assignment.
- (C) Task orders will contain, as a minimum, the following information:
 - (i) Signature of the Contracting Officer
 - (ii) Contract number, task order number, and date
 - (iii) Title and description of work requested
 - (iv) Total price, including the number of labor hours, travel and material estimates, and other resources authorized
 - (v) Delivery schedule and documentation requirements
 - (vi) Quality assurance standards, as appropriate
 - (vii) Any other necessary information
- (D) The Contractor shall construe each task order as formal direction and authorization to proceed with the implementation of each special task assignment. The Contracting Officer may modify a task order in the same manner as it is issued via formal amendments.
- (E) Within thirty (30) calendar days after receipt of each task order Request For Proposal (RFP) and Statement of Work (SOW), the Contractor shall submit a proposal for Government approval. The proposal shall include:
 - (i) Discussion of the technical approach for performing the work and rationale for any proposed changes to the task order.
 - (ii) Estimated date of commencement of work and any changes proposed to the schedule of performance.
 - (iii) The total price for completion of the task order including:
 - (a) The total direct labor hours estimated to complete the task.
 - (b) The travel and material estimates, if applicable.
 - (c) An estimate for subcontractors and consultants, if applicable.

- (F) The Contracting Officer shall approve, in writing, all task orders within ten working days of receipt or enter into negotiations with the Contractor. Accepted task orders shall be definitized and incorporated by reference into the contract via contract modification. The contract modification will reflect the mutual agreement of the parties with respect to changes in contract value, funding, and any other terms deemed pertinent to the task order.
- (G) After the Contractor accepts the task order, any revisions that become necessary in the scope of work shall require Government approval prior to implementation. The Contractor shall promptly submit a revision of the task order to the Contracting Officer. Revised task orders submitted by the Contractor are subject to the review and approval of the Contracting Officer. Hours or costs incurred in excess of those authorized by the Contracting Officer shall be at the Contractor's own expense.
- 9.2 Failure to agree to any adjustment of the task order shall be a dispute under the Disputes clause. However, nothing in this clause shall excuse the Contractor from proceeding with the task order as written.
- 9.3 The price for effort under CLIN 10 will be paid upon satisfactory completion of each individual special task assignment.

10.0 RESERVED

11.0 FAR 52.216-18 ORDERING (OCT 1995) [Note: Applicable to IDIQ contract portion only]

- (a) Any supplies and services to be furnished under this contract shall be ordered by issuance of delivery orders or task orders by the individuals or activities designated in the Schedule. Such orders may be issued from the effective date of the contract through the second quarter of calendar year 2010 (June 30, 2010).
- (b) All delivery orders or task orders are subject to the terms and conditions of this contract. In the event of conflict between a delivery order or task order and this contract, the contract shall control.
- (c) If mailed, a delivery order or task order is considered "issued" when the Government deposits the order in the mail. Orders may be issued orally, by facsimile, or by electronic commerce methods only if authorized in the Schedule.

12.0 FAR 52.216-19 ORDER LIMITATIONS (OCT 1995) [Note: Applicable to IDIQ contract portion only]

(a) *Minimum order.* When the Government requires supplies or services covered by this contract in an amount of less than:

- (1) One Launch Service, or
- (2) One Special Task Assignment, or
- (3) One Non-Standard Service

The Government is not obligated to purchase, nor is the Contractor obligated to furnish, those supplies or services under the contract.

(b) *Maximum order.* The Contractor is not obligated to honor—

- (1) During any calendar year, any order for a single item in excess of
6 Pegasus and 6 Taurus Launch Service or
Unlimited Special Task Assignment or
Unlimited Non-Standard Service
- (2) Any order for a combination of items in excess of **6 Pegasus and 6 Taurus launch services**; or
- (3) A series of orders from the same ordering office within thirty (30) days that together call for quantities exceeding the limitation in paragraph (b) (1) or (2) of this clause.

(c) If this is a requirements contract (i.e., includes the Requirements clause at subsection 52.216-21 of the Federal Acquisition Regulation (FAR)), the Government is not required to order a part of any one requirement from the Contractor if that requirement exceeds the maximum-order limitations in paragraph (b) of this clause.

(d) Notwithstanding paragraphs (b) and (c) of this clause, the Contractor shall honor any order exceeding the maximum order limitations in paragraph (b), unless that order(s) is returned to the ordering office within thirty (30) days after issuance, with written notice stating the Contractor's intent not to ship the item(s) called for and the reasons. Upon receiving this notice, the Government may acquire the supplies or services from another source.

13.0 52.216-22 INDEFINITE QUANTITY (OCT 1995) [Note: Applicable to IDIQ contract portion only]

- (a) This is an indefinite-quantity contract for the supplies or services specified and effective for the period stated, in Section B and C of the Schedule. The quantities of supplies and services specified in the Schedule are estimates only and are not purchased by this contract.
- (b) Delivery or performance shall be made only as authorized by orders issued in accordance with contract Section C, Clause 11.0, FAR 52.216-18, Ordering (Oct 1995). The Contractor shall furnish to the Government, when and if ordered, the supplies or services specified in the Schedule up to and including the quantity designated in the Schedule as the "maximum." The Government shall order at least the quantity of supplies or services designated in the Schedule as the "minimum."
- (c) Except for any limitations on quantities in contract Section C, Clause 12.0, FAR 52.216-19 Order Limitations (Oct 1995) or in the Schedule, there is no limit on the number of orders that may be issued. The Government may issue orders requiring delivery to multiple destinations or performance at multiple locations.
- (d) Any order issued during the effective period of this contract and not completed within that period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the contract's effective period; provided, the Contractor shall not be required to make any deliveries under this contract after December 31, 2012.

14.0 LAUNCH SERVICE TASK ORDERING PROCEDURES [Note: Applicable to IDIQ contract portion only]

14.1 *Requirements for Competition.* The intent of IDIQ is to support missions in addition to the awarded firm and optional missions. The Government will provide all multiple award Contractors a fair opportunity to be considered for task orders issued under this contract based upon the specific task order requirements, unless the Contracting Officer determines that one of the following apply:

- (A) The Agency need is of such urgency that competing the requirements among Contractors would result in unacceptable delays
- (B) Only one Contractor is capable of providing the service requested at the level of quality required because the service ordered is unique or highly specialized

Orbital
SpaceX



- (C) The order should be issued on a sole-source basis in the interest of economy and efficiency as a logical follow-on to an order issued under the contract, provided that all Contractors were given a fair opportunity to be considered for the original order; or
- (D) It is necessary to place an order to satisfy the minimum guarantee.

14.2 Types of Task Orders

There are two types of task orders that may be issued under this contract. The first type is an LSTO. Any required services related to a specific launch service will be included in the LSTO. All items other than launch services and items not related to a specific launch service will be obtained by task orders referred to herein as Special Task Assignments (Studies and Analyses).

14.3 Launch Service Task Orders

- (A) *Requests for Launch Service Proposals (LSPs)*. Prior to the issuance of a request for LSP, exchanges and fact-finding may take place with multiple award Contractors. The request for LSP will include specific information unique to the mission such as payload mass and volume; orbital requirements (such as altitude and/or inclination); target launch date and science window, if appropriate; and any unique payload design considerations.

The request for LSP will provide any special instructions regarding the level of detail required in the proposal. The request for LSP will include a date and time for submission of the proposal. Proposals will be due within thirty (30) calendar days from the date of the request for LSP unless stated otherwise. The Contractor shall submit one original and five copies of the LSP to the Contracting Officer.

- (B) *Launch Service Proposal*. The Contractor, when submitting an LSP, shall indicate the LSP is compliant with the contract terms, statement of work, and the specific requirements contained in the request for LSP.

Pricing for all LSPs shall not exceed the prices contained in the Schedule. The prices contained in the Schedule are prices, which can be adjusted downward by the Contractor for the specific launch service being proposed. Any Contractor proposed reduction will be applicable to the current LSP only and will not be deemed as a permanent reduction of the prices contained in the Schedule. Any mission unique modifications not priced in the non-standard services must be separately identified and individually priced, and are not limited by the unit price in the Schedule.

The proposed launch service price, including applicable priced non-standard services and mission uniques shall be totaled for a single firm-fixed price for all efforts required under the order for that launch service. The total firm fixed-price shall be applied to the percentages in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, for conversion to dollar amounts for each payment event. In addition, the Work Plan milestones shall be appropriately modified to add any non-standard and/or mission unique services.

- (C) *Mandatory Proposal Submission.* Unless otherwise agreed to by the Contracting Officer, it is mandatory for contract holders under multiple award NLS contracts to respond to each order for launch service requirements provided these requirements are identified in the schedule and do not conflict with the contract ordering limitations. In the event there arises legitimate reasons for an awardee not to submit a proposal for a particular launch service task order (e.g., limited capacity to perform, excessive performance capability) the Contracting Officer may waive the requirement for proposal submission.
- (D) *LSP Evaluation/LSTO Selection Criteria.* All LSPs shall be submitted by the date and time specified in the request for LSP, or it will be treated as a late proposal in accordance with FAR 52.215-1, Instructions to Offerors – Competitive Acquisition.

If this requirement is met, the Contracting Officer will consider the following three factors prior to award of an LSTO:

- (i) Technical capability/risk, including the following:
 - (a) Contractor's ability to meet SOW and specific payload requirements, including launch period and launch date
 - (b) Launch vehicle qualification or reasonableness of the Offeror's plan to obtain qualification prior to mission launch
 - (c) Information gained through Government insight and approval activities
 - (d) Status of significant baseline vehicle changes and resolution of anomalies
 - (e) Unique terms and conditions contained in a contract, which may impact price, performance or risk
 - (f) Proposed launch vehicle's demonstrated flight experience

- (ii) Reasonableness of proposed price, including any proposed quantity discounts, probable cost impacts to the Government as a result of technical risks introduced by the LSP, and any increased price to the Government associated with any proposed launch locations or other launch service provider unique processing requirements.
- (iii) Past performance, with emphasis given to the most recent and more relevant experience, including small business achievements.

The Requests for Launch Service Proposals shall state, whether all evaluation factors other than cost or price, when combined, are—

- (i) Significantly more important than cost or price;
- (ii) Approximately equal to cost or price; or
- (iii) Significantly less important than cost or price.

The Government reserves the right to modify the evaluation criteria for individual LSTOs. The final evaluation criteria will be defined in the request for LSTO proposal. In any event, the Government intends to award an LSTO to the Contractor who provides the best value in launch services that meet the Government's requirements.

- (E) *Award of an LSTO.* Each of the IDIQ Contractors will be notified of the Government's award of an LSTO. Pursuant to FAR 16.505(a) (7), a task order award, or proposed award, is not subject to protest except on the grounds that the order increases the scope, period, or maximum value of the contract. The debriefing requirements of FAR 15.5 are not applicable to orders issued under this contract. However, the Government intends to provide feedback to the other Contractors regarding any significant issues resulting in their non-selection.
- (F) *Modifications to LSTOs.* After an LSTO is issued, it may be necessary to add priced non-standard services to the LSTO. These additions will be accomplished via modifications to the original LSTO. In addition, mission uniques that are not included in the priced non-standard services may be added to, or deleted from, LSTOs via modification to the original LSTO. In this instance, the terms of the existing LSTO, such as price, milestone events, and Work Plan completion criteria, may be modified to reflect the change. The remainder of the price of the modification will be applied to the remaining payment milestone event amounts, as performance dictates.
- (G) *Task Order Authorization and Content.* The only persons authorized to issue task orders under this contract are the KSC Contracting Officers. Task orders will be issued in writing. However, any facsimile, or electronic, task

orders issued by the Contracting Officer will be confirmed in writing within five (5) business days. The Contractor will acknowledge receipt and acceptance of the task order by signing the task order and returning it to the Contracting Officer. Each task order will include the following information:

- (i) Date of the task order
- (ii) Contract number and task order number
- (iii) Statement of Work and any other documentation on which the price is based
- (iv) Product or service to be delivered
- (v) Task order price
- (vi) Completion/Delivery date
- (vii) Accounting and appropriation data
- (viii) Any other necessary information

15.0 PRESERVATION, PACKING, PACKAGING, AND MARKING FOR DOCUMENTATION

Preservation, packing, packaging and marking for shipment of all items ordered hereunder shall be in accordance with commercial practice and adequate to insure safe transportation, acceptable by common carrier, and transportation at the most economical rate(s). The Contractor shall place identical requirements on all subcontracts for items delivered to NASA.

16.0 FAR 52.246-11 HIGHER LEVEL CONTRACT QUALITY REQUIREMENT (FEB 1999)

The Contractor shall comply with the higher-level quality standard selected below.

	<u>Title</u>	<u>Number</u>	<u>Date</u>	<u>Tailoring</u>
<input checked="" type="checkbox"/>	ISO	9001/2000	2000	
<input type="checkbox"/>	Aerospace QMS	AS9100	2001	

17.0 INSPECTION SYSTEM RECORDS

The Contractor shall maintain records evidencing inspections in accordance with the Inspection clauses of this contract for one year after delivery of all items and/or completion of all services called for by the contract.

18.0 REQUIRED TIME OF DELIVERY FOR LAUNCH SERVICES

18.1

Table C-2: Reserved

Table C-3: Reserved

CLIN	Mission	Quantity	Launch Date (CY)
1	NuSTAR	1	August 15, 2011

Table C-4: IDIQ LSTO Delivery Schedule

18.2 Reserved

19.0 ADJUSTMENTS TO LAUNCH SCHEDULE

- 19.1 The Government Contractor will give written notice of any desired change in the launch schedule as soon as possible. In the case of a request for postponement of the launch date by the Government/Contractor, the Government/Contractor will propose a new launch date. Within two weeks of receipt of the written request of a launch schedule adjustment, the Government/Contractor will inform the Contractor/Government whether a launch opportunity exists as requested or will propose an alternatively available launch date. The Government/Contractor has thirty (30) days following receipt of the Contractor's/Government's proposition to give its written agreement. If mutual agreement on the revised launch date cannot be reached due to a Range conflict, resolution between the parties shall be handled by the Current Launch Schedule Review Board (CLSRB) in accordance with Air Force Space Command Instruction (AFSPCI) 10-120113. If mutual agreement on the revised launch date cannot be reached due to launch vehicle or payload readiness, resolution between the parties shall be handled per the Disputes Clause, FAR 52.233-1.
- 19.2 Once payment(s) of the standard launch service price has been made, postponement requests by the Government/Contractor shall not exceed a total of twelve (12) months, exclusive of any applicable grace period, for each party under this contract clause. In the event of a single postponement, or cumulative postponements for each launch service by the Government/Contractor exceeds twelve (12) months, the contract shall be subject to equitable adjustment for that portion of delay exceeding twelve (12) months in addition to the maximum postponement fees for the twelve month delay, and/or other available remedies provided for under contract Section C, Clause 28.0, Advance Understanding Regarding Termination Settlement Under FAR 52.212-4(l), and contract Section C, Clause 1.0(m), Termination for cause. Alternatively, requests for adjustments to the launch schedule occurring greater than twenty-seven (27) months prior to the launch date shall be subject to equitable adjustment. Any delay declared by the Government, which results in a launch date later than the contract period of performance shall be subject to an equitable adjustment.
- 19.3 If the Contractor requests a postponement of the launch date and the Government agrees to the postponement, the Parties agree that, in lieu of Termination for cause and in place of actual damages, and as fixed, agreed, and liquidated damages, the price of each applicable launch service shall be reduced, dependent upon when receipt of the notification is received, for each calendar day of delay in excess of the grace period by the amount as shown in Table C-5. In this event, the Government shall have the right of approval of the revised launch date prior to its implementation. The Government shall also have the right of approval of the reallocation of launch vehicles if milestone payments have already been made towards a designated launch vehicle. Finally, the Government shall have the right of approval prior to any revision in its position

- (i.e., the order in the Contractor's launch manifest queue sequence, if it results in the postponement of the Government launch date).
- 19.4 If the Contractor fails to request a postponement and the major program milestone event designated as the launch is delayed (i.e., the launch service is not completed by the contractual required time of delivery launch date), for reasons other than those excusable delays described in paragraph 19.9, then the Contractor shall pay the Government for each day of delay the maximum liquidated damages, cumulatively not to exceed _____ for each launch service under this contract. Alternatively, if delivery or performance is so delayed by the Contractor, the Government may terminate this contract in whole or in part under contract Section C, Clause 1.0(m), Termination for cause, of this contract and in that event, the Contractor shall be liable for fixed, agreed, and liquidated damages accruing until the time the Government may reasonably obtain delivery or performance of similar supplies or services, up to the maximum specified in Table C-5. The liquidated damages shall be in addition to any other costs under contract Section C, Clause 1.0(m), Termination for cause.
- 19.5 Each postponement request by the Contractor that is not the result of paragraph 19.9 herein is subject to the liquidated damages shown in Table C-5. The delay damage _____ are calculated on a per mission basis.

Table C-5: Contractor Liquidated Damages and Grace Periods

The maximum amount paid for delays (in excess of the grace period) by the Contractor shall not exceed a total of _____ A grace period is defined as the number of days the Contractor may delay the launch date, without incurring liquidated damages.

- 19.6 If the Government requests a postponement of the launch date, the Parties agree that, in place of actual damages, and as fixed, agreed, and liquidated damages, the price of each applicable launch service shall be increased, dependent upon when receipt of the notification is received, for each calendar day of delay in excess of the grace period by the amount as shown in Table C-6. Each postponement request by the Government that is not the result of paragraph 19.9 subject to the postponement fees shown in Table C-6.

Table C-6: Government Postponement Fees and Grace Periods

- 19.7 The maximum amount paid for delays (in excess of the grace period) by the Government shall not exceed a total of _____ A grace period is defined as the number of days the Government may delay the launch date without incurring postponement fees.

- 19.8 In the event that the Government/Contractor postpones the launch date, the payment schedule shall be suspended for the length of the delay and then resumed with all remaining payments shifted by the amount (length) of the delay. For Government delays only, the Contractor may elect to receive payments as major program milestone events are completed in lieu of the payment of postponement fees, provided funding is available and obligated to the contract.
- 19.9 The Government/Contractor will not be charged with postponement fees/liquidated damages when the delay in delivery or performance arises solely out of causes beyond the control of the Government/Contractor and not due to the fault or negligence of the Government/Contractor. Such causes include, but are not limited to the following:
- Delays resulting from mission rule requirements, Range launch constraints, Range mandatory hold requirements, acts of God, acts (including delay or failure to act) of any Governmental authority (De Jure or De Facto), wars (declared or undeclared), riots, revolution, hijacking, fires, freight embargoes, sabotage, epidemics and interruptions of essential services such as electricity, natural gases, fuels and water, or any condition which jeopardizes the safety of the employees of the Contractor, the Government, or its subcontractors; or a launch vehicle failure investigation, provided the Government retains its original position in the order of the queue sequence and that all data related to the failure investigation is made available to the Government without restriction.
- 19.10 Once a specific launch date and time have been established, they may be changed by the cumulative amount of the grace period established above by the Government or the Contractor without consideration to the other party if the mission requirements can be met. The cumulative total of grace periods exercised by either the Government or the Contractor shall not exceed 150 days.
- 19.11 The amount of postponement fees shall be added to/subtracted from (as applicable) the next milestone payment made pursuant to the contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria. In addition, the delivery schedule shall be adjusted to reflect the revised launch date.
- 19.12 In the event of an anomaly on a previous mission of the same launch vehicle (including a non-NASA mission), the Government reserves the right to delay the launch service, until the next available launch opportunity, without accruing damages or providing an equitable adjustment to the Contractor until resolution of the anomaly.
- 19.13 This clause, including grace periods, shall not apply to missions with scientific and planetary launch windows and/or planetary and lunar exclusion periods.

Requests for launch adjustments for missions with scientific and planetary launch windows and/or planetary and lunar exclusion periods shall be in accordance with the "Changes" clause of this contract. Contractor requests for launch adjustments for missions with scientific and planetary launch windows and/or planetary and lunar exclusion periods are subject to equitable adjustment and require approval of the Government prior to implementation. If Government approval is granted, the Contractor shall be obligated to launch at the next available scientific opportunity and planetary launch window, irrespective of other launch commitments or customer's priorities.

20.0 PLACE OF PERFORMANCE

The place of performance and launch site will be identified in each launch service or task order. The delivery schedule and/or period of performance of this contract are based upon the launch dates specified in the schedule or each individual task order.

21.0 ACCOUNTING AND APPROPRIATION DATA

UPN	Requisition Number	Funding Citation	Previous Contract Obligation (\$)	This Contract Obligation (\$)	Total to Date Contract Obligation (\$)
378	4200130653	76-378-10-S/FC400000/ 76VA000/EXCX22005D	\$0.00	\$100,000	\$100,000

Table C-7: Accounting and Appropriation Data

22.0 NFS 1852.227-72 DESIGNATION OF NEW TECHNOLOGY REPRESENTATIVE AND PATENT REPRESENTATIVE (JULY 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:

Name	Title	Mailcode	Address
D. Makufka	New Technology Representative	YA-C1	John F. Kennedy Space Center, NASA Kennedy Space Center, FL 32899
R. Heald	Patent Representative	CC-A	John F. Kennedy Space Center, NASA Kennedy Space Center, FL 32899

(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. Inquiries 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.

23.0 USE OF GOVERNMENT PROPERTY, FACILITIES, AND ASSETS

- 23.1 The Contractor shall obtain and maintain any necessary agreements between the Contractor and any Government Agency authorizing the use of Government property, facilities, assets or services required in performance of this contract.
- 23.2 The Government makes no warranty whatsoever as to the suitability for use of Government property, facilities and other assets made available under the terms and conditions of any Government use agreements or contracts. Any costs necessary to maintain, restore, refurbish, and/or replace any assets, for use under this contract, shall result in no increase in the price of this contract.
- 23.3 The Contractor is responsible for determining the suitability for use of all materials, property, and facilities acquired or made available to the Contractor by the Government under any contract agreement. Any use of Government-Furnished Property (GFP), materials, or facilities and services shall not relieve the Contractor of full launch service performance responsibility.

24.0 MISSION SUCCESS DETERMINATION, INVESTIGATION, AND CORRECTIVE ACTIONS

24.1 Mission Success Criteria

- (A) A mission will be determined a *Mission Success*, whether or not the payload performs its intended mission, if:
- (i) The payload is placed into the required orbit by the LV, and
 - (ii) Received telemetry data shows the Interface Control Document (ICD) environments and parameters were not exceeded, and
 - (iii) The LV causes no damage to the payload during deployment or thereafter from collision or contamination products.
- (B) A mission will be determined a *Partial Mission Success* if:
- (i) The payload is not placed into the required orbit, but evaluation of the payload's capabilities and longevity at the actual orbit meets 70% or more of the Payload Evaluation Criteria four (4) months after launch, or
 - (ii) Received telemetry data shows the ICD environments and parameters were exceeded (or no confirming telemetry data were received), but evaluation of the payload's capabilities and longevity meets 70% or more of the Payload Evaluation Criteria four (4) months after launch, or

- (iii) The payload is damaged during deployment or thereafter from collision or contamination products, but evaluation of the payload's capabilities and longevity at the actual orbit meets 70% or more of the Payload Evaluation Criteria four (4) months after launch.
- (C) A mission will be determined a *Failed Mission* if the payload:
- (i) Is destroyed during launch, or
 - (ii) Cannot be separated from the LV, or
 - (iii) Is not placed into the required orbit and evaluation of the payload's capabilities and longevity at the actual orbit meets less than 70% of the Payload Evaluation Criteria four (4) months after launch, or
 - (iv) Is subjected to environments or parameters which exceed the ICD and evaluation of the payload's capabilities and longevity meets less than 70% of the Payload Evaluation Criteria four (4) months after launch, or
 - (v) Is damaged during deployment or thereafter from collision or contamination products and evaluation of the payload's capabilities and longevity meets less than 70% of the Payload Evaluation Criteria four (4) months after launch.

24.2 Mission Success Determination

- (A) The LSPO, along with the payload customer, will establish the Payload Evaluation Criteria. The Payload Evaluation Criteria will consist of:
- (i) The payload orbit/attitude ranges determined necessary to obtain data sufficient to meet 70 percent or more of the mission's objectives, and
 - (ii) A list of payload systems which, individually and/or in combination, are required to operate successfully in order to achieve 70 percent or more of the mission's objectives, and
 - (iii) A list of payload instruments which, individually and/or in combination, are required to operate successfully in order to achieve 70 percent or more of the mission's objectives.
- (B) The Contractor shall be responsible for providing telemetry data confirming the required orbit conditions and payload environments were met as stated in the ICD. The Contractor shall measure and provide telemetry data to the extent required by the SOW. The Government will be responsible for providing data supporting payload capability status and longevity analysis.

- (C) In order to determine mission success under paragraphs 24.1(B) or 24.1(C) (iii), (iv) or (v), the Government will evaluate the payload condition four (4) months after launch. If the payload meets 70% or more of its capabilities and longevity as listed in the Payload Evaluation Criteria, the mission will be considered a partial mission success. If the payload operation is less than 70% of the capabilities and longevity as listed in the Payload Evaluation Criteria, the mission will be considered a failed mission.
- (D) The Contracting Officer has authority to determine whether a launch mission is a Mission Success, Partial Mission Success, or a Failed Mission, based on the application of the Payload Evaluation Criteria.

24.3 Procedures

- (A) Not less than two (2) months prior to launch of a payload, the Contracting Officer will provide, in writing, the Payload Evaluation Criteria to the Contractor.
- (B) Within fifteen (15) days from submittal of the Final Flight Report (DRD C4-13), the Contracting Officer will either determine the launch a Mission Success or inform the Contractor of the Government's intent to withhold final payment and mission determination until the completion of the payload operability and longevity evaluation.
- (C) If the Government informs the Contractor it will withhold the final payment, the payload's operability and longevity will be assessed four (4) months from the launch date using the Payload Evaluation Criteria for mission success determination. The Government will also utilize the Final Flight Report (DRD C4-13), findings from the Contractor's investigation board, and findings from the NASA-chaired Failure Review Board (FRB) if activated. The Contracting Officer shall submit a final determination of either Partial Mission Success or Failed Mission within one (1) week of the payload evaluation. If a Partial Mission Success determination is made, an operability ranking of the payload between 70% and 100% will be included.

24.4 Performance-Based Payment for Final Mission Success Determination

- (A) In the event the Contracting Officer determines the launch service a Mission Success, the Contractor shall receive full payment of the final payment event for the launch service.
- (B) In the event the Contracting Officer determines the launch service a Partial Mission Success, the Government will pay no portion of the final payment in accordance with Table C-8.

Mission Success Determination	Payload Operability Ranking (%)	% Awarded of Final Payment	% of Total Launch Service Price Reallocated/Refunded to the Government
Full Success	95-100	100	0
Partial Mission Success	70-94	0	0
Failed Mission	0-69	0	15

Table C-8: Mission Success Payment Schedule

- (C) In the event the Contracting Officer determines the launch service a Failed Mission, the Government will pay no portion of the final payment (reference Table C-8) and the Contractor shall reallocate 15% of the total launch service (CLIN) price to another NASA mission or refund the 15% if a subsequent launch service is unavailable. Withholding of the final payment and a 15% reallocation/refund to the Government are the sole remedies of the Government for a Failed Mission determination.

24.5 Investigation and Corrective Action

- (A) In the event of an anomaly or failed mission, a NASA-chaired FRB will determine the cause of anomaly or failure, if activated. The FRB will evaluate all available data from the launch vehicle, payload, Range, and other sources in order to determine if the mission failure was attributable to the launch vehicle or conditions for which the Contractor would normally be expected to control or avoid. Based on the findings and recommendations of the FRB, the Government shall make the final determination as to partial mission success or failed mission. If the Contractor disagrees with the determination, the decision shall be subject to the Disputes clause of this contract.
- (B) If one or more of the ICD environmental requirements are exceeded or orbit requirements are not achieved on a particular mission, the Contractor shall investigate the anomaly or failure at its own expense. The Contractor shall determine the scope of the investigation and shall conduct and control the investigation. The Government may designate representatives to observe and participate in the Contractor's failure investigation board. If the Contractor changes the launch vehicle design, the Contractor shall provide NASA insight into the change. The Government may establish an independent assessment team to assess the Contractor's investigative and corrective actions.
- (C) The Contractor shall present to the Government its findings resulting from the investigation and the proposed corrective actions (return to flight activities), if any. The Contractor shall be responsible for proving the corrective action is sufficient to return to flight. The Contracting Officer may either accept or reject any finding or corrective action. If the Contracting

Officer accepts a finding and the related corrective action, the Contractor shall be responsible for the cost of the corrective action including re-acceptance for NASA missions. In the event the Government requires additional analyses or tests beyond those planned by the Contractor, the Contractor shall implement the Contracting Officer's written direction to perform the additional tests or analyses. The costs of implementing these additional tests or analyses may be the basis for an adjustment to this contract. The Government may, at its option and its expense, conduct its own investigation of the anomaly or failure. The Contractor shall cooperate with and fully support the Government investigation.

- (D) The Contractor shall report to NASA any flight anomalies from non-NASA missions. For non-NASA missions, the requirements of paragraphs 24.5(B) and (C) apply to these anomalies as the Contracting Officer finds them to be related to NASA missions. Rights under the Default clause and the right to require corrective action before return to flight shall also apply in the event the requirements of NPD 8610.7 are not met.

24.6 Finality of Contracting Officer's Determination

- (A) Except for the determinations described in paragraph 24.6(B), each of the Contracting Officer's Determinations, under paragraph 24.2, are subject to FAR 52.233-1, Disputes.
- (B) The following Contracting Officer's Determinations under this clause are final and not subject to FAR 52.233-1, Disputes:
 - (i) A determination the payload is not operational
 - (ii) A determination that a payload defect is not the cause of the payload being inoperable
 - (iii) A determination of the Payload Evaluation Criteria
- (C) In the event the Contractor appeals the Government decision under the Disputes clause in accordance with FAR subpart 33.2 and submits a claim under the Contract Disputes Act, the parties hereby agree the burden of proof shall rest on the Contractor to prove the failure was not due to the LV. The Contractor assumes the responsibility for providing confirming data. The Government will be responsible for providing proof of payload degradation or reduction in operational capacity or longevity.

24.7 Acceptance

Final acceptance of the launch service will be accomplished following the Contracting Officer's mission success determination.

25.0 GOVERNMENT INSIGHT AND APPROVAL

- 25.1 The Contractor shall provide NASA an adequate level of insight into and/or approval of certain Contractor tasks and milestones in order to ensure all reasonable steps have been taken that result in the highest probability of mission success. This includes insight into any corporation, corporate divisions, subsidiaries, joint ventures, partner(s) and/or any other business entity actually performing launch vehicle manufacturing, management, payload/launch vehicle integration, testing and launch. This also includes insight into certain major sub-contractor tasks and milestones (i.e., those sub-contractors that perform major portions of manufacturing or integration of the launch vehicle system).
- 25.2 The Government's monitoring of launch services provided by the private sector has two elements: approval and insight. Government approval is defined as providing authority to proceed and/or formal acceptance of requirements, plans, tests, or success criteria in specified areas. Where Government approval is required, the Contractor shall submit the necessary documentation to the Contracting Officer and copies to the Contracting Officer's Technical Representative (COTR).
- 25.3 Government insight is defined as gaining an understanding necessary to knowledgeably concur/non-concur with the Contractor's actions through watchful observation, documentation, meeting attendance, reviews, tests and compliance evaluations. Where Government insight is required, the Contractor shall notify the Contracting Officer, the Government Resident Office or the appropriate Government operations organization at the launch site of meetings, reviews, or tests in sufficient time to permit meaningful Government participation.
- 25.4 Should approval or insight identify non-compliance with the terms and conditions of the contract, a difference in interpretation of test results, or disagreement with the Contractor technical directions, the Government will take appropriate action within the terms of the contract to ensure compliance via written direction to the Contractor.
- 25.5 NASA shall have insight into any Contractor initiated fleet changes or any changes that may affect NASA missions. This insight shall be accommodated with no increase in contract price.
- 25.6 Specific areas where the Government requires approval and/or insight are listed in paragraphs 25.7 and 25.8 respectively. The paragraphs document requirements specified in NPD 8610.23a, Technical Management of Expendable Launch Vehicle (ELV) Launch Services.

25.7 Specific areas requiring Government approval are:

- (A) Payload-to-LV interface control documents/drawings.
- (B) Decisions/resolutions of action items as determined by joint NASA/Contractor mission integration working groups.
- (C) Mission unique hardware design, analysis, manufacture, and test.
- (D) Mission unique software design, analysis, and test.
- (E) The Contractor's Safety and Health, Reliability, and Quality Management Plans
- (F) Top-level test plans, requirements, and success criteria for integrated vehicle systems tests and launch site vehicle assembly and test.
- (G) Launch commit criteria.
- (H) Closeout of actions from NASA-Chaired Launch and Flight Readiness Reviews.
- (I) Payload handling procedures and deviations.
- (J) Integrated payload/vehicle mate, test, and closeout procedures and deviations.
- (K) Integrated payload/vehicle mate, test, and closeout as-run procedures and deviations.
- (L) Launch countdown procedures and deviations that affect payload/vehicle integrated assembly.
- (M) Anomaly resolutions that affect the integrated assembly.
- (N) Launch Go/No-Go.

25.8 Specific areas to be open to Government insight are:

- (A) Baseline vehicle design, analyses, and configuration management.
- (B) Production program reviews, plans, and schedules.
- (C) Production and systems test Material Review Boards.
- (D) Critical flight hardware pedigree.

- (E) Safety and Mission Assurance compliance evaluations (prime and subcontractors).
 - (F) Pre-ship reviews.
 - (G) Design and qualification reviews.
 - (H) Major/critical problems.
 - (I) Major system and integrated systems tests.
 - (J) Post-test data.
 - (K) Anomaly resolutions.
 - (L) Failure analysis.
 - (M) Vehicle/ground support equipment procedures.
 - (N) Launch site support work schedules and plans.
 - (O) Launch site vehicle preparations and closeout data.
 - (P) Vehicle walkdown inspections.
 - (Q) Operations and procedure discipline.
 - (R) Work practices and documentation.
 - (S) Conduct of Contractor chaired Mission, Launch, and Flight Readiness Reviews.
 - (T) Post-flight vehicle, tracking, and range data.
 - (U) Post-flight anomaly investigations/close-outs.
- 25.9 Notwithstanding the insight and approvals set forth in Clause 25.0 herein, the Contractor assumes full performance responsibility as set forth in this contract, and neither the Government's insight nor its approval under this paragraph 25 shall be construed as a defense to any finding of mission success or final acceptance / rejection of the launch service.
- 26.0 GOVERNMENT LAUNCH READINESS ASSESSMENT**
- 26.1 The Contractor shall participate in a Government-chaired Flight Readiness Review (FRR) (reference 2.2.1.3(D) of the SOW) to be held subsequent to the

Government-chaired Launch Readiness Review (LRR) and any Contractor LRR. At the FRR, the Contractor shall summarize the status of its launch vehicle and all supporting elements and attest to readiness to launch the mission. If, after due consideration of the status of the launch vehicle, payload and other launch support systems, the Government does not agree that the total mission is ready for launch, the Government has the right to delay the launch.

- 26.2 The Contractor shall poll the Government in the final launch countdown and any re-cycle procedure during status checks for their approval of the final launch readiness assessment. The Government may declare a "HOLD" and delay the launch at any time during the final launch countdown.
- 26.3 In the event the Government delays the launch, as a result of exercising its rights this clause, and the causes of the delay were within the control of or due to the fault or negligence of the Contractor or its Subcontractors at any tier, then the provisions of Section C, Clause 19.0, Adjustments to Launch Schedule shall govern and the Contractor shall be deemed to have caused the delay. For the purpose of this clause, the burden of proof for showing that the causes of delay were within the control or fault and/or negligence on the part of the Contractor or its Subcontractors at any tier rests with the Government. If the Government delays the launch beyond the grace period established in Section C, Clause 19.0 and the causes of the delay were not within the control or due to the fault or negligence of the Contractor or its Subcontractors at any tier, then the provisions of Section C, Clause 19.0, Adjustments to Launch Schedule shall apply.

27.0 LICENSES AND PERMITS FOR A LAUNCH SERVICE OPERATOR

The Contractor shall obtain and maintain the necessary licenses, permits and clearances that may be required by the Department of Transportation, Department of Commerce, Department of Defense, NASA, or other Governmental agencies in order to provide launch services under this contract. No Federal Aviation Administration commercial launch license is required under this contract. All costs and fees associated with obtaining licenses, permits and clearances are included in the standard launch service price. Approvals required by the payload are the responsibility of NASA.

28.0 ADVANCE UNDERSTANDING REGARDING TERMINATION SETTLEMENT UNDER FAR 52.212-4(I)

- 28.1 In the event the Government decides to exercise its right to terminate all or part of this contract under Section C, Clause 1.0(I), Termination for the Government's convenience, it is agreed in advance that the Contractor, after receipt of a written notice of termination, will have satisfied all obligations and discharged all duties required by Section C, Clause 1.0(I), Termination for the Government's convenience, when the Contractor has refunded that portion of the milestone-

based payment(s) for each launch service affected by the termination, in accordance with Table C-9.

- 28.2 The parties agree that by virtue of the refund specified in Table C-9, any and all claims for equitable adjustment as a result of the termination are fully satisfied and discharged. The parties agree that this settlement represents fair compensation for Contractor effort accomplished for the terminated portions of the contract and that the terms as stated herein represent full and final settlement between the parties. The parties agree that the Contractor shall retain title to all hardware associated with the terminated launch service. The parties agree that the above settlement shall represent the total amount to be paid to the Contractor without agreeing on or segregating the particular elements of costs or profits comprising this amount.
- 28.3 The refund amount shall be payable in full no later than thirty (30) days after receipt of the written notice of termination. Delinquent payment(s) shall be subject to interest at the applicable rate as determined by the Secretary of the Treasury.

Performance Based Milestone/ Payment No.	Payment(s) Months Before Launch	Amount (% of Launch Service CLIN Price)	Cumulative Amount of Launch Service Payments (\$)	Termination for Convenience of the Government Repayment Schedule – Percentage (%) of Cumulative Payments Made to Date to be Returned to Government
1	L-27	10	TBD	
2	L-24	10	TBD	
3	L-21	10	TBD	
4	L-18	10	TBD	
5	L-15	10	TBD	
6	L-12	10	TBD	
7	L-09	10	TBD	
8	L-06	10	TBD	
9	L-03	10	TBD	
10	Launch	10	TBD	

Table C-9: Launch Payment and Termination Repayment Schedule

- 28.4 The provisions of this Contract clause shall only apply until the point of intentional ignition of the launch vehicle. The provision of this Contract clause shall in no way be deemed to limit the rights of the Government under Section C, Clause 1.0(m), Termination for Cause. In the event the Government exercises its rights

under Section C, Clause 1.0(m), Termination for Cause, the provisions of this contract clause will not apply.

29.0 CO-MANIFESTED PAYLOADS

29.1 Definitions

- (A) Primary Payload: the payload which serves to determine the launch day and time, and without which the vehicle would not launch.
- (B) Secondary Payload: any payload carried by the launch vehicle in space not required by the primary, which requires the approval of the primary payload customer prior to manifesting; or, any payload, if not ready to support scheduled launch day, which would be demanifested and replaced with a mass simulator.

29.2 NASA Secondary Payload with NASA Primary Payload

(A) Procedures

NASA may request to manifest a NASA secondary payload on a NASA primary mission. The preferred method of ordering this secondary payload service will be via non-standard service task order. If the non-standard service is not provided in the catalog for the particular launch service, the Government will submit a task order requesting a proposal for a non-standard service to accommodate a secondary payload. The Contracting Officer will provide a description of the proposed secondary payload including, as a minimum: volume, mass, attachment requirements, and data requested by the Contractor. The task order will identify any additional non-standard services or mission unique requirements.

Upon receipt of the task order, the Contractor shall develop a proposal to accommodate the secondary payload or provide a response that the Contractor cannot accommodate the secondary payload on any existing planned missions. The Contractor's proposal shall include a firm fixed-price for the secondary payload (if not ordered under a non-standard service), any additional non-standard services required, any mission unique services, and a proposed payment schedule with accomplishment criteria.

If the Government is unable to provide the secondary payload for launch vehicle integration or there is insufficient time to complete a new mission analysis before the launch date, the Government will bear the cost and the Contractor shall be responsible for designing, fabricating, and installing a secondary payload mass simulator.

In the event of termination for convenience of the NASA secondary payload services, all costs associated with terminating such service shall be determined in accordance with contract Section C, Clause 1.0(l), "Termination for the Government's convenience."

(B) Delays

Any delays shall be subject to contract Section C, Clause 19.0, Adjustments to Launch Schedule.

(C) Mission Success

Mission success determination for the NASA primary and secondary payload shall be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions with the following exception:

In the event the secondary payload causes primary mission failure, NFS 1852.228-78, Cross-Waiver of Liability for NASA Expendable Launch Vehicle Launches, shall apply and the primary mission shall be determined a full success for purposes of contract Section C, paragraph 24.2.

29.3 Non-NASA Payload with NASA Primary Payload

(A) Procedures

The Contractor may propose to manifest a non-NASA payload on a NASA primary mission. The Contractor shall propose the mission requirements and consideration to be received by NASA. The Contractor shall submit, at no cost to NASA, a detailed payload description, a dual payload compatibility assessment, and any additional documentation or analyses requested by NASA. NASA maintains the right to approve or disapprove the non-NASA payload proposed for manifesting on a NASA primary mission. The Government will respond to the Contractor's request within sixty (60) calendar days after receipt of all NASA requested documentation and analyses.

If the Contractor is unable to provide the non-NASA payload for launch vehicle integration or there is insufficient time to complete a new mission analysis before the launch date, the Contractor shall bear the cost and be responsible for designing, fabricating, and installing a secondary payload mass simulator.

(B) Delays

NASA shall incur no costs or damages associated with delaying the non-NASA mission under any circumstance. The non-NASA payload shall not cause the NASA primary mission launch date to be delayed without NASA approval. If NASA approves a launch delay caused by the non-NASA payload, the NASA Contracting Officer will unilaterally determine whether the Government will be entitled to equitable adjustment under contract Section C, Clause 19.0, Adjustments to Launch Schedule.

(C) Mission Success

Mission success determination for the NASA primary payload shall be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions with the following exception:

In the event the non-NASA payload causes primary mission failure, NFS 1852.228-78, Cross-Waiver of Liability for NASA Expendable Launch Vehicle Launches, shall apply and the primary mission shall be determined a full success for purposes of contract Section C, paragraph 24.2.

29.4 NASA Secondary Payload on a Non-NASA Primary Payload

(A) Procedures

NASA may request to manifest a NASA secondary payload on a non-NASA primary mission via a task order requesting a proposal for a non-standard service to accommodate a secondary payload. The Contracting Officer will provide a description of the proposed secondary payload including, as a minimum: volume, mass, attachment requirements, and data requested by the Contractor. The task order will also identify any additional non-standard services or mission unique requirements. If the Government is unable to provide the secondary payload for LV integration or there is insufficient time to complete a new mission analysis before the launch date, the Government will bear the cost and the Contractor shall be responsible for designing, fabricating, and installing a secondary payload mass simulator.

Upon receipt of the task order, the Contractor shall develop a proposal to accommodate the secondary payload or provide a response that the Contractor cannot accommodate the secondary payload on any existing planned missions. The Contractor's proposal shall include a firm-fixed price for the secondary payload, any additional non-standard services required, any mission unique services, and a proposed payment schedule with accomplishment criteria. The Contractor shall identify the primary mission and the target launch date for the mission. The Contractor shall make all

arrangements for and coordinate the concurrence of manifesting the secondary payload with the primary mission customer.

The terms and conditions of this contract shall apply to NASA secondary payload efforts, however the level of NASA insight and approval will be limited to those activities directly affecting the secondary payload. The Contracting Officer shall identify any additional reductions to the terms and conditions of the contract in each task order for NASA secondary payload services.

In the event of termination for convenience of the NASA secondary payload services, all costs associated with terminating such service shall be determined in accordance with contract Section C, Clause 1.0(l), "Termination for the Government's convenience."

(B) Delays

The Contractor shall incur no costs or damages associated with delaying the secondary mission. The secondary mission shall not cause the primary mission launch date to be delayed without Contractor approval. If the Contractor approves a launch delay caused by the secondary payload, delay damages shall not apply.

(C) Mission Success

Mission success determination for the NASA secondary payload shall be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions with the following exception:

In the event the primary payload causes secondary mission failure, NFS 1852.228-78, Cross-Waiver of Liability for NASA Expendable Launch Vehicle Launches, shall apply and the secondary mission shall be determined a full success for purposes of contract Section C, paragraph 24.2.

29.5 Contractor Risk Determination for NASA Secondary Missions

Upon receipt of task order, the Contractor shall, as part of NASA secondary payload integration activities, perform a payload compatibility assessment for all manifested NASA secondary payloads. The Contractor shall notify the Contracting Officer, in writing if, in the Contractor's opinion, the NASA secondary payload would pose unacceptable risk to the success of the primary mission. The notification shall provide detailed substantiation of said risks.

In the event the Contractor, or the primary mission Customer, determines the risk is unacceptable, the Contractor and the Contracting Officer will mutually agree to terminate the task order or re-manifest the NASA secondary payload on another mission. In the event the task order is terminated, NASA will only be liable for the cost of the compatibility analysis and any other payments made to the Contractor shall be repaid to the Government or reallocated to another mission.

30.0 EXPORT CONTROL AND FOREIGN NATIONALS

- 30.1 The Contractor shall comply with all U.S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120-130, and the Export Administration Regulations (EAR), 15 CFR Parts 730-744, in the performance of this contract. The Contractor shall be responsible for obtaining export licenses, where required.
- 30.2 The Contractor shall be responsible for obtaining the required export licenses before utilizing foreign nationals in the performance of this contract, including instances where the work is to be performed at launch sites. NASA will be responsible for all ITAR requirements for their foreign national customers, as applicable.
- 30.3 The Contracting Officer, or designated representative, may authorize the Contractor to export ITAR-controlled technical data pursuant to the exemption set forth in 22 CFR 125.4(b)(3) where an international agreement provides for the export of such data and the data does not disclose the details of the design, development, production or manufacture of any defense article.

31.0 DOMESTIC SOURCE CRITERIA

- 31.1 In addition to the certification regarding United States commercial provider of space transportation services (Public Law 105-303, Title II, Section 201), the Contractor shall continue to comply with domestic source criteria. Failure to comply with the criteria may be grounds for "Termination for Cause" in accordance with contract Section C, Clause 1.0(m).
- 31.2 Participation in this procurement is restricted to prime Contractors from the United States LV/services industry. "United States industry" means any corporation, partnership, joint venture, association, or other entity which is organized or existing under the laws of the United States or any State, and whose controlling interest is held by United States citizens. "Launch services" means all services required in the performance of this contract, excluding those necessary to produce or manufacture launch vehicles, its components and other equipment and facilities required in the performance of the contract. "Controlling interest" means ownership of an amount of equity in such entity sufficient to direct management or to void transactions entered into by management.

Ownership of at least fifty-one (51) percent of the equity creates a reputable presumption that such interest is controlling.

- 31.3 The Contractor shall provide in the performance of this contract launch vehicles that are domestic end products. The LV shall be a domestic end product only if the cost of its components, mined, produced or manufactured in the United States exceeds 50 percent of the cost of all its components. The cost of each component includes transportation costs to the place of incorporation into the LV and any applicable duty (whether or not a duty-free entry certificate is issued). "Components," as used in this contract clause, means those materials and supplies directly incorporated into the end product.
- 31.4 The Contractor shall provide, in the performance of this contract, domestic launch services. Launch services shall be considered to be domestic if the cost for launch services performed by United States industry sources exceeds 50 percent of the cost of the total required launch services.

32.0 LIABILITY FOR THIRD PARTY CLAIMS

- 32.1 This contract clause applies to Third Party claims that arise out of the conduct of hazardous launch activities during the provision of launch services under this contract. More specifically, this contract clause allocates between the Government and the Contractor the risk of Third Party claims for damage to or loss of property or personal injury or death arising from the burning, explosion, detonation, combustion or impact of an LV, its payload, or a component thereof, whether or not the payload is separated from the LV, from the time of launch until thirty (30) days after launch.

32.2 Definitions

Covered Launch Activities: Any and all activities involved in the preparation of a launch vehicle and payload for launch, and conduct of the launch, when those activities take place at a launch site in the United States.

Launch: The intentional ignition of the first-stage motor(s) of the LV that has been integrated with the payload.

Launch Vehicle: The baseline LVS consisting of a common core booster section and any strap on motors attached, one (1) interstage, an orbital adjust module, the payload fairing and the payload adapter.

Party or Parties: The Contractor or NASA, or both.

Payload: All NASA or NASA-sponsored equipment that has been integrated with the LV for transportation into earth orbit or escape trajectories.

- Related Party: (i) Any of the Parties' directors, officers, agents, employees or customers
- (ii) Any of the Parties' contractors, subcontractors, or suppliers at any tier involved directly or indirectly in the performance of this Contract
- (iii) Any entity having any right, title or interest, whether through sale, lease or service arrangement or otherwise, directly or indirectly, in the payload, the LV, or the launch service.

Third Party: Any person or entity other than NASA, the Contractor and Related Parties.

32.3 Required Insurance for Liability to Third Parties

- (A) The Contractor shall continue in effect or acquire insurance to protect the Parties and the Related Parties from liability for claims from Third Parties for damage to or loss of property or personal injury or death arising in connection with the covered launch activities under this contract. The amount of the required insurance shall be the maximum amount available in the commercial marketplace at reasonable cost, but shall not exceed \$500 million for each launch. The policy or policies shall name NASA and the related parties as additional insurers. Required insurance coverage shall attach no later than the arrival of the LV at the launch site and shall remain in force for at least thirty (30) days following launch.
- (B) The Contractor shall provide acceptable evidence to the Contracting Officer of required insurance no later than thirty (30) days prior to the beginning of the covered launch activities. The amount of required insurance and the terms and conditions for the policy or policies shall be subject to review by the Contracting Officer. Once reviewed, the policy or policies may not be modified or canceled without the prior, written approval of the Contracting Officer.
- (C) The foregoing insurance requirement does not preclude the Contractor from acquiring or continuing in effect any additional insurance to protect the interests of the Contractor or its Related Parties.

32.4 Third Party Claims in Excess of Required Insurance

- (A) NASA has determined that launches, under this contract, are conducted by NASA in performance of its functions, as specified in 42 U.S.C. § 2473(a). As a result, once the Contractor or its insurers have paid out for Third Party claims the amount of required insurance under paragraph 32.3(B), NASA will consider any additional Third Party claims for damage to or loss of property

or personal injury or death arising from the launches as claims against the United States under the authority of 42 U.S.C. § 2473 (c)(13).

- (B) The Contractor (once it or its insurers have paid to Third Party claimants, from their own funds, an amount equal to the amount of required insurance for a Launch) shall adjust, settle and pay meritorious and reasonable additional Third Party claims in excess of the amount of required insurance. To the extent NASA determines that such costs exceed \$25,000, it will forward such claim to the Secretary of Treasury for certification and payment pursuant to 31 U.S.C. § 1304(a). Such costs are subject to the usual tests for allowability and the total of such costs shall be paid up to a limit of \$1.5 billion above the insurance obtained by the Contractor for each launch.
- (C) In evaluating Third Party claims against the United States paid by the Contractor, NASA will consider such a claim to be meritorious unless the claim represents:
- (i) Liabilities for which the Contractor is otherwise responsible under the express terms or conditions of the contract or a task order issued under this contract
 - (ii) Liabilities for which the Contractor has failed to insure or to maintain insurance as required by the Contracting Officer
 - (iii) Liabilities for which the Contractor has not reasonably adjusted, settled, or paid on a meritorious and reasonable basis.
 - (iv) Liabilities that result from willful misconduct or lack of good faith on the part of any of the Contractor's directors, officers, managers, superintendents, or other representatives who have supervision or direction of:
 - (a) All or substantially all of the Contractor's business
 - (b) All or substantially all of the Contractor's operations at any one plant or separate location in which this contract is being performed
 - (c) A separate and complete major industrial operation in connection with the performance of this contract
 - (v) Liabilities that arise from the willful misconduct or gross negligence of the Claimant or, in the case of a claim based on death, the claimant's descendant.

32.5 Third Party Liability for NASA Secondary Payloads on Non-NASA Primaries

The requirements of this clause 32.0 shall apply to all launch services provided under this contract except for those services involving NASA secondary payloads which are manifested on a launch service for non-NASA (commercial) primary payloads. In the event that a NASA secondary payload is manifested on a launch service for a non-NASA (commercial) primary payload, the contractor shall obtain third party liability insurance and indemnification for third party claims in excess of insurance pursuant to the Commercial Space Launch Act, 49 U.S.C. 70101 et seq.

33.0 FAR 52.212-3 OFFEROR REPRESENTATIONS AND CERTIFICATIONS--
COMMERCIAL ITEMS () (MAR 2005) ALT I (APRIL 2002)

The Offeror Representations and Certifications (Attachment E1) as completed by the Contractor are hereby incorporated in their entirety by reference with the same force and effect as if they were given in full text.

34.0 FAR 52.212-5 CONTRACT TERMS AND CONDITIONS REQUIRED TO
IMPLEMENT STATUTES OR EXECUTIVE ORDERS--COMMERCIAL ITEMS
(MAR 2004)

- (a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clause, which is incorporated in this contract by reference, to implement provisions of law or Executive orders applicable to acquisitions of commercial items: 52.233-3, Protest after Award (Aug 1996) (31 U.S.C. 3553).
 - (b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items: 
- (1) 52.203-6, Restrictions on Subcontractor Sales to the Government (Jul 1995), with Alternate I (Oct 1995) (41 U.S.C. 253g and 10 U.S.C. 2402).
 - (2) 52.219-3, Notice of Total HUBZone Set-Aside (Jan 1999) (15 U.S.C. 657a).
 - (3) 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (Jan 1999) (if the offeror elects to waive the preference, it shall so indicate in its offer) (15 U.S.C. 657a).

- (4)(i) 52.219-5, Very Small Business Set-Aside (June 2003) (Pub. L. 103-403, section 304, Small Business Reauthorization and Amendments Act of 1994).
- (ii) Alternate I (Mar 1999) of 52.219-5.
- (iii) Alternate II (June 2003) of 52.219-5.
- (5)(i) 52.219-6, Notice of Total Small Business Set-Aside (June 2003) (15 U.S.C. 644).
- (ii) Alternate I (Oct 1995) of 52.219-6.
- (iii) Alternate II (Mar 2004) of 52.219-6.
- (6)(i) 52.219-7, Notice of Partial Small Business Set-Aside (June 2003) (15 U.S.C. 644).
- (ii) Alternate I (Oct 1995) of 52.219-7.
- (iii) Alternate II (Mar 2004) of 52.219-7.
- (7) 52.219-8, Utilization of Small Business Concerns (Oct 2000) (15 U.S.C. 637(d)(2) and (3)).
- (8)(i) 52.219-9, Small Business Subcontracting Plan (Jan 2002) (15 U.S.C. 637(d)(4)).
- (ii) Alternate I (Oct 2001) of 52.219-9.
- (iii) Alternate II (Oct 2001) of 52.219-9.
- (9) 52.219-14, Limitations on Subcontracting (Dec 1996) (15 U.S.C. 637(a)(14)).
- (10)(i) 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns (June 2003) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323) (if the offeror elects to waive the adjustment, it shall so indicate in its offer).
- (ii) Alternate I (June 2003) of 52.219-23.
- (11) 52.219-25, Small Disadvantaged Business Participation Program-Disadvantaged Status and Reporting (Oct 1999) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).
- (12) 52.219-26, Small Disadvantaged Business Participation Program-Incentive Subcontracting (Oct 2000) (Pub. L. 103-355, section 7102, and 10 U.S.C. 2323).

- (13) 52.222-3, Convict Labor (June 2003) (E.O. 11755).
- (14) 52.222-19, Child Labor-Cooperation with Authorities and Remedies (Jan 2004) (E.O. 13126).
- (15) 52.222-21, Prohibition of Segregated Facilities (Feb 1999).
- (16) 52.222-26, Equal Opportunity (Apr 2002) (E.O. 11246).
- (17) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (Dec 2001) (38 U.S.C. 4212).
- (18) 52.222-36, Affirmative Action for Workers with Disabilities (Jun 1998) (29 U.S.C. 793).
- (19) 52.222-37, Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (Dec 2001) (38 U.S.C. 4212).
- (20)(i) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (Aug 2000) (42 U.S.C. 6962(c)(3)(A)(ii).
- (ii) Alternate I (Aug 2000) of 52.223-9 (42 U.S.C. 6962(i)(2)(C)).
- (21) 52.225-1, Buy American Act-Supplies (June 2003) (41 U.S.C. 10a-10d).
- (22)(i) 52.225-3, Buy American Act-Free Trade Agreements-Israeli Trade Act (Jan 2004) (41 U.S.C. 10a-10d, 19 U.S.C. 3301 note, 19 U.S.C. 2112 note, Pub. L. 108-77, 108-78).
- (ii) Alternate I (Jan 2004) of 52.225-3.
- (iii) Alternate II (Jan 2004) of 52.225-3.
- (23) 52.225-5, Trade Agreements (Jan 2004) (19 U.S.C. 2501, *et seq.*, 19 U.S.C. 3301 note).
- (24) 52.225-13, Restrictions on Certain Foreign Purchases (Oct 2003) (E.o.s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).
- (25) 52.225-15, Sanctioned European Union Country End Products (Feb 2000) (E.O. 12849).
- (26) 52.225-16, Sanctioned European Union Country Services (Feb 2000) (E.O. 12849).

- (27) 52.232-29, Terms for Financing of Purchases of Commercial Items (Feb 2002) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).
 - (28) 52.232-30, Installment Payments for Commercial Items (Oct 1995) (41 U.S.C. 255(f), 10 U.S.C. 2307(f)).
 - (29) 52.232-33, Payment by Electronic Funds Transfer-Central Contractor Registration (Oct 2003) (31 U.S.C. 3332).
 - (30) 52.232-34, Payment by Electronic Funds Transfer-Other than Central Contractor Registration (May 1999) (31 U.S.C. 3332).
 - (31) 52.232-36, Payment by Third Party (May 1999) (31 U.S.C. 3332).
 - (32) 52.239-1, Privacy or Security Safeguards (Aug 1996) (5 U.S.C. 552a).
 - (33)(i) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (Apr 2003) (46 U.S.C. Approx 1241 and 10 U.S.C. 2631).
 - (ii) Alternate I (Apr 1984) of 52.247-64.
- (c) The Contractor shall comply with the FAR clauses in this paragraph, (c), applicable to commercial services, that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or executive orders applicable to acquisitions of commercial items or components:
- (1) 52.222-41, Service Contract Act of 1965, as Amended (May 1989) (41 U.S.C. 351, *et seq*).
 - (2) 52.222-42, Statement of Equivalent Rates for Federal Hires (May 1989) (29 U.S.C. 206 and 41 U.S.C. 351, *et seq*).
 - (3) 52.222-43, Fair Labor Standards Act and Service Contract Act-Price Adjustment (Multiple Year and Option Contracts) (May 1989) (29 U.S.C. 206 and 41 U.S.C. 351, *et seq*).
 - (4) 52.222-44, Fair Labor Standards Act and Service Contract Act-Price Adjustment (Feb 2002) (29 U.S.C. 206 and 41 U.S.C. 351, *et seq*).
 - (5) 52.222-47, SCA Minimum Wages and Fringe Benefits Applicable to Successor Contract Pursuant to Predecessor Contractor Collective Bargaining Agreements (CBA) (May 1989) (41 U.S.C. 351, *et seq*).

- (d) *Comptroller General Examination of Record*. The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed-bid, is in excess of the simplified acquisition threshold, and does not contain the clause at 52.215-2, Audit and Records-Negotiation.
- (1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.
 - (2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.
 - (3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.
- (e) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c) or (d) of this clause, the Contractor is not required to include any FAR clause, other than those listed below (and as may be required by an addenda to this paragraph to establish the reasonableness of prices under Part 15), in a subcontract for commercial items or commercial components--
- (1) 52.222-26, Equal Opportunity (E.O. 11246);
 - (2) 52.222-35, Affirmative Action for Disabled Veterans and Veterans of the Vietnam Era (38 U.S.C. 4212);
 - (3) 52.222-36, Affirmative Action for Workers with Disabilities (29 U.S.C. 793); and
 - (4) 52.247-64, Preference for Privately-Owned U.S. Flag Commercial Vessels (46 U.S.C. 1241) (flow down not required for subcontracts awarded beginning May 1, 1996).

35.0 LISTING OF CLAUSES INCORPORATED BY REFERENCE

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

35.1 FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1) CLAUSES

FAR 52.202-1	Definitions (May 2001)
FAR 52.211-14	Notice of Priority Rating for National Defense Use (Sep 1990) (DOC9)
FAR 52.215-1(c)(3)	Instructions to Offerors-Competitive Acquisition (Jan 2004)
FAR 52.222-1	Notice to the Government of Labor Disputes (Feb 1997)
FAR 52.222-21	Prohibition of Segregated Facilities (Feb 1999)
FAR 52.222-37	Employment Reports On Disabled Veterans And Veterans of the Vietnam Era (Dec 2001)
FAR 52.232-18	Availability of Funds (Apr 1984)
FAR 52.232-25	Prompt Payment (Oct 2003)
FAR 52.232-29	Terms for Financing of Purchases of Commercial Items (Feb 2002)
FAR 52.232-34	Payment by Electronic Funds Transfer – Other than Central Contractor Registration (May 1999) Paragraph (b) <i>blank is completed with "no later than 15 days prior to submission of the first request for payment."</i>
FAR 52.233-1	Disputes (July 2002)
FAR 52.242-15	Stop-Work Order (Aug 1989)
FAR 52.243-1	Changes—Fixed-Price (Aug 1987) Alternate I (Apr 1984)
FAR 52.246-4	Inspection of Services—Fixed-Price (Aug 1996)
FAR 52.246-25	Limitation of Liability--Services (Feb 1997)

35.2 NASA FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES:

NFS 1852.204-76	Security Requirements for unclassified Information Technology (IT) Resources (July 2000)
NFS 1852.215-84	Ombudsman (Oct 2003) Dr. Woodrow Whitlow at (321) 867-2355
NFS 1852.219-74	Use of Rural Area Small Businesses (Sep 1990)
NFS 1852.219-75	Small, Small Disadvantaged, and Women-Owned Small Business Subcontracting Reporting (May 1999)
NFS 1852.219-76	NASA 8 Percent Goal (Jul 1997)
NFS 1852.222-70	Export Licenses (Feb 2000) Alternate I
NFS 1852.223-70	Safety and Health (April 2002)
NFS 1852.223-75	Major Breach of Safety or Security (July 2000)
NFS 1852.227-70	New Technology (May 2002)
NFS 1852.228-78	Cross-Waiver of Liability for NASA Expendable Launch Vehicle Launches (Sep 1993)

NFS 1852.228-75 Minimum Insurance Coverage (Oct 1988)
NFS 1852.243-71 Shared Savings (Mar 1997)

35.3 KENNEDY SPACE CENTER STANDARD CLAUSES

KSC 52.204-90 Security Controls at KSC (Nov 2000)
KSC 52.214-90 Hand Carried Offers and Use if Commercial Couriers (Aug 1998)
KSC52.243-90 Authorized Changes (Feb 1990)

36.0 FAR 52.252-2 CLAUSES INCORPORATED BY REFERENCE (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 these addresses:

<http://www.arnet.gov/far/> GSA FAR Homepage

<http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm> NASA FAR Supplement Homepage

<http://www.ksc.nasa.gov/procurement/clause/> KSC Index of Procurement Clauses

37.0 FAR 52.252-6 AUTHORIZED DEVIATIONS IN CLAUSES (APR 1984)

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.

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

38.0 SPECIAL UNDERSTANDING REGARDING DAMAGE TO GOVERNMENT PAYLOADS

Prior to intentional ignition of the launch vehicle on the launch pad, the Contractor shall not be responsible for damage to the spacecraft while the spacecraft is under the control of the Contractor, except when such damage is caused by the gross negligence, willful misconduct, or lack of good faith by the Contractor. In the event the Contractor is determined to be responsible for such

damage, the Contractor shall reimburse the Government for the cost of spacecraft repairs as well as any costs associated with launch delays as set forth in the Section C, Clause 19.0, entitled "Adjustments to Launch Schedule." After intentional ignition, the provisions of Contract Section C, clause 24.0 shall apply.

39.0 USE OF GOVERNMENT PRODUCTION, RESEARCH PROPERTY, TOOLING, AND FACILITIES ON A NO-CHARGE BASIS

In performing this contract, the Contractor and its Subcontractors are authorized to use on a no-charge, noninterference basis the Government-owned production, research property (including tooling, test equipment, and facilities), provided under the contract(s) specified below and identified in the cognizant Contracting Officer's letter approving use of the property. Use is authorized on the basis that it will not interfere with performance of the Government contract(s) under which the property was originally furnished and is accountable. Use shall be in accordance with the terms and conditions of these contracts and the cognizant Contracting Officer's approval letter.

Contract No(s):

NASA/VAFB Buildings and Facilities 836 and 840

SECTION D

DOCUMENTS, EXHIBITS, AND ATTACHMENTS

The following eight attachments are hereby incorporated into this contract in their entirety, made a part hereof, and shall apply in the performance of this contract.

- Attachment D1** Statement of Work
 - Exhibit 1** Requirements and Capabilities
 - Exhibit 2** Standard Service List
 - Exhibit 3** Non-Standard Services
 - Exhibit 4** Certificate of Flight Readiness
 - Exhibit 5** Reserved
 - Exhibit 6** Awarded LSTO Missions
 - Exhibit 7** Launch Vehicle Qualification
 - Exhibit 8** Reserved
- Attachment D2** Data Requirements List (DRL)
- Attachment D3** Supplemental Data List (SDL)
- Attachment D4** Small Business and Small Disadvantaged Business Subcontracting
Plan
- Attachment D5** Safety and Health Plan
- Attachment D6** Reliability Plan
- Attachment D7** Quality Management Plan
- Attachment D8** Work Plan
- Attachment D9** Most Favored Customer Certification Plan
- Attachment D10** Acronyms and Abbreviations

ATTACHMENT D1A

PEGASUS
STATEMENT OF WORK

ATTACHMENT D1A

STATEMENT OF WORK

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STATEMENT OF WORK

1.0 INTRODUCTION

1.1 Scope

This Statement of Work (SOW) and all Exhibits and documents attached or referenced herein define the Government's requirements for the Contractor to provide launch services in support of NASA's Launch Services Program Office (LSPO). The scope of this contract effort includes risk category 2 and 3 launch services capable of delivering, at a minimum, a 250 kg payload to orbit at an altitude of 200 km and a launch inclination of 28.5°.

This SOW defines the overall launch service requirements for 'NASA or NASA-sponsored payloads' (hereinafter referred to as 'payloads'). The Contractor shall perform all tasks necessary, consistent with the terms and conditions of this contract and the SOW provisions identified herein, to safely and reliably launch payloads in accordance with NASA-defined mission objectives. The Contractor shall support advanced planning and perform analysis tasks as directed by the Contracting Officer.

It is the general contemplation of the parties to this contract that the Contractor shall have a broad mission in performing launch service related functions for the Government and designees. Therefore, the general scope of the contract covers any launch service and launch service related activities arising from the SOW in support of earth and space science exploration, and space station re-supply.

1.2 Objectives

The goal of the NASA Launch Services (NLS) contract is to provide the Agency with domestic launch services that are safe, successful, reliable, and affordable. The launch services will be provided at a fixed price. The contract will, to the maximum extent practical, incorporate best commercial practices.

The objectives of this contract are to:

- Ensure the safety of the public and all personnel, hardware, and property associated with the launch services.
- Provide affordable, accurate, and on-time delivery of LSPO manifested payloads to space.
- Provide a mechanism to incorporate new launch services, technology upgrades, improved systems engineering processes, and advances in manufacturing techniques.

- Provide risk mitigation while utilizing commercial practices.
- Provide flexible manifesting policy that recognizes the national priorities of NASA missions.
- Provide a capability to optimize cost, schedule, and performance to satisfy mission objectives.
- Provide for clear Government visibility into program schedule, technical performance, and risk.
- Foster competition and create opportunities for new, emerging launch service providers.
- Promote partnering among customers, launch service provider, and the LSPO program to maximize flexibility and responsiveness to customers needs.

1.3 Compliance Documents

The Contractor shall comply with the requirements contained in the following documents.

Document No.	Revision	Document Title
EWR 127-1	Dec 1999	Eastern/Western Range, Range Safety Requirements ¹ (Required for VAFB or CCAS launches only)
ISO 9001/2000-2000		International Organization of Standardization
NPR 8715.3	31 May 2004	NASA Safety Manual w/Change 2 ^{2,3}
NPD 8710.3	B, April 2004	NASA Policy For Limiting Orbital Debris ⁴
NASA-STD-8719.9	May 2002	NASA Safety Standard for Lifting Devices and Equipment ²

¹ Any agreements between the Contractor and the Range for a tailored EWR 127-1 are acceptable to NASA.

² The Contractor shall comply with NPR 8715.3 and NASA-STD-8719.9 for processes performed in NASA facilities.

- ³ Any agreement between the Contractor and NASA for a tailored KHB 1710.2 are acceptable.
⁴ Contractor will provide required data necessary for NASA to perform assessment.

1.4 Definitions

Mission Specific: all standard, non-standard, and mission unique services provided to meet the requirements of the payload and mission.

Mission Unique: services provided that are newly performed or developed to meet mission requirements and that are not included in the standard and non-standard services. Typically these pertain to first flight items.

2.0 STANDARD LAUNCH SERVICE

The Contractor shall perform all launch service tasks necessary to deliver payloads to defined orbital parameters in compliance with mission requirements. The launch service shall support missions to all orbital parameters, consistent with vehicle configuration capabilities and launch Range restrictions. The Contractor shall provide launch services, which are in compliance with all Range requirements. The Contractor shall make all arrangements with the responsible authorities for the required launch Range authorization and support for vehicle processing; integrated payload/vehicle processing, launch; and launch site maintenance and modifications. NASA reserves the right to approve the choice of launch site [e.g. Cape Canaveral Air Force Station (CCAFS), Vandenberg Air Force Base (VAFB)].

The Contractor shall furnish all services, maintain all equipment and infrastructure including, but not limited to: program management, mission integration, launch site support, ground and flight system safety, and performance assurance, necessary to accomplish the safe and successful launch of payloads to the required orbit conditions within required launch periods. The Contractor shall provide facilities and services at Contractor facilities for NASA personnel performing insight and approval functions during the performance of the contract. The Contractor shall provide access to launch vehicle documentation in support of NASA insight and approval functions.

The Contractor shall provide all necessary services, test hardware and software, and mission specific elements required to integrate the payload(s) to the launch vehicle systems. The Contractor shall meet all launch service performance requirements described in Exhibit 1, Capabilities, Specifications and Environments. All capabilities and conditions stated in Exhibit 1 must be consistent and compatible with all other capabilities and conditions stated in Exhibit 1 and in response to the requirements of the SOW. Any exceptions to the stated capabilities or conditions must be specifically noted.

The Contractor shall coordinate with NASA Public Affairs Office all press releases concerning launches under this contract. During vehicle build-up, payload integration, and launch countdown, the Contractor shall allow NASA Public Affairs access to facilities to photograph and videotape activities, including hazardous operations. The Contractor shall assist NASA Public Affairs in developing the launch commentary for NASA Television by furnishing launch countdown and operations background material. The Contractor may also be asked to provide information to support the development of the press kit document and the NASA pre-launch and post-launch news conferences. The Contractor shall coordinate with NASA Public Affairs Protocol and Guest Services a minimum of sixty (60) days in advance of each launch to determine any special requirements.

The Contractor shall provide standard launch services as delineated in Exhibit 2, Standard Services List. All hardware, software, analyses, and support required to provide each item listed in Exhibit 2, shall be included in the standard launch service.

All Data Requirements List (DRL) and Supplemental Data List (SDL) items, identified in Attachment D2 and D3 respectively, shall be included in the standard launch service.

2.1 Launch Vehicle (LV)

The standard launch service shall include, as a minimum, the following:

- (A) Launch timing capabilities with
 - (i) Launch periods from payload arrival at the final processing site to launch in as small as 25 days in duration, assuming a standard payload processing flow
 - (ii) Multiple approximately 24 hour re-launch attempts in the event of a launch scrub (with exception of abort inside 45 seconds)
 - (iii) Launch window as short as 5 minutes
 - (iv) Simultaneous launch campaigns, with launches separated by approximately 7 days from same site.
- (B) A launch vehicle and Payload Adapter (PA) with appropriate electrical and mechanical interfaces (as described in Exhibit 1) required for payload integration and testing.

- (C) A payload separation system with the following characteristics:
- (i) The payload shall be protected from debris generated by the separation system.
 - (ii) The separation system shall function in a manner that prevents any re-contact with the payload, including Contractor-provided attach hardware on the payload, by the upper stage or any element of the separation system once separation has been initiated.
 - (iii) Redundant payload separation indications.
- (D) A Payload Fairing (PLF) with the following items, as a minimum:
- (i) Three payload access doors – two 33 cm x 21.6 cm (13 in x 8.5 in) and one circular 11.4 cm (4.5 in) - whose locations shall be mission unique within the stated structural limitations of the fairing (defined in Exhibit 1). Additional or different size doors shall be provided as a non-standard service. The Contractor shall provide payload personnel access through all standard and non-standard access doors from fairing mate through final vehicle closeout.
 - (ii) Thermal environments specified not to exceed 72°C, +/- 2°C (161.6°F, +/- 3.6°F) during ascent on any launch vehicle component inside the fairing with a view factor to the payload, with the exception of the upper stage motor and fairing wall which shall not exceed 177°C (351°F). Maximum thermal environments shall be specified in the mission specific ICD (DRD C2-1).
 - (iii) Thermal blankets sealed or filtered such that venting of blanket material debris does not contaminate the payload.
- (E) Flight instrumentation, as specified in Exhibit 1, paragraph 9.0, Payload Environment Instrumentation, to provide data adequate to support Section C, paragraph 24.2, Mission Success Determination.
- (F) Capability to spin and despin payloads, when applicable, prior to deployment over a minimum range of zero (0) to 355 degrees per second with an accuracy of ± 2 degrees per second of the target rate.
- (G) A Collision/Contamination Avoidance Maneuver (CCAM), when applicable, following payload separation to minimize payload contamination and any chance of re-contact with the separated payload.

- (H) Provisions for the prevention of static charging on umbilical connectors that may be subjected to static charging from plasma heating or atmospheric particulate matter, either by bleed resistors, dead facing or connector covers.
- (I) Decals of a NASA logo and mission patch in accordance with NASA provided artwork. The size of the logo and patch shall be a maximum of 24 in. x 24 in. The logo installation shall be appropriately documented in the mission Interface Control Document (ICD) (DRD C2-1).
- (J) Availability of a Test Payload Adapter (TPA), with appropriate mechanical interfaces and payload separation system, to support payload integration and testing at NASA/NASA Customer (NNC) facilities (within the Continental United States) or such other locations as defined by the ICD. At this facility, the Contractor shall support, with necessary personnel and equipment, the following: a fit check of the payload with the flight PA, two consecutive weeks of environmental testing with a TPA, one week of consecutive payload shock testing with a TPA, and sufficient pyrotechnics for two shock test firings.
- (K) Command, control, and power signal capability as directed from the launch control facility to the payload umbilical Ground Support Equipment (GSE) per the mission specific ICD.
- (L) All mechanical GSE required to interface with the payload mechanical adapters and accomplish the payload to launch vehicle mating operation per the mission ICD.
- (M) Both halves of the electrical connector at each spacecraft-to-launch vehicle interface. The Contractor shall provide 3 sets for each electrical connector interface: flight set, a flight spare set, and a set for spacecraft testing.
- (N) All other hardware equipment, software, infrastructure, and logistics necessary to perform the contracted launch services.

2.2 Program Management

The Contractor shall provide all program management functions required to provide the launch services and to satisfy the mission requirements for each NASA mission. The program management function of this contract shall provide insight to NASA for all technical and programmatic activities performed under this contract.

The Contractor shall coordinate all program management functions and issues directly with the KSC LSPO designated representative(s). The NASA Contracting Officer is the only NASA representative authorized to provide formal contract direction.

2.2.1 Formal Reviews

The Contractor shall conduct program reviews, design reviews, and readiness reviews, and shall provide for the participation of NNC. The Contractor shall provide minutes and action items resulting from each review to NASA within one week after the review. A copy of the presentation material shall be available at the review for all NNC attendees (DRD C1-1).

2.2.1.1 Program Reviews

During the contract performance period, the Contractor shall conduct Program Reviews with NASA at least once per year to: report development and production status, ensure schedules support program objectives, review action items, review program schedules, and discuss any issues. The intent of the program review is to provide a forum for open dialog between NASA and the Contractor with respect to launch services. NASA will provide status of Agency direction at the reviews. The review location shall alternate between NASA and Contractor facilities unless mutually agreed upon to do otherwise.

2.2.1.2 Design Reviews – Mission Unique

The Contractor shall conduct and chair/co-chair design reviews, as described below, that apply to the system, subsystem, component, and software level for all first flight mission unique items. Where there is not a direct match between a SOW specified mission unique design review(s) and the Contractor's standard review(s), the Contractor's review process will be acceptable provided it addresses equivalent content. For items previously flown, the following design reviews will not be required, provided the Contractor allows insight into design and prior performance of each item.

(A) Mission Unique Requirements Review (MURR)

The Contractor shall conduct a MURR prior to the Mission Unique Preliminary Design Review (MUPDR) with NNC to review the mission unique design requirements for the following items:

- (i) System requirements' identification and definition to a level adequate to verify launch vehicle performance capabilities.
- (ii) Design restrictions, limitations, and known violations.
- (iii) Physical and mechanical interfaces (e.g., payload to launch vehicle, payload envelope, and access provisions).

- (iv) Electrical interfaces (e.g., launch vehicle to payload, payload to umbilical, interfaces with electrical ground support equipment, aircraft electrical systems, ground batteries, telemetry, grounding, and power).
- (v) Functional interfaces (e.g., structures, structural loads, and vibration).
- (vi) Avionics systems and interfaces (e.g., payload avionics interfaces with launch vehicle, separation systems, telemetry interfaces, payload command and telemetry, and RF).
- (vii) Mass properties.
- (viii) Environmental requirements (e.g., thermal, contamination, vibration, pressure, Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC), shock, launch complex RF, and lightning).
- (ix) Orbital requirements, launch vehicle performance, launch window, injection accuracy, and deployment attitudes and rates.
- (x) Payload/Launch Vehicle (LV) separation requirements (e.g., separation conditions, launch vehicle post-separation maneuver requirements, and telemetry).

(B) Mission Unique Preliminary Design Review (MUPDR)

The Contractor shall conduct a preliminary detailed design review prior to major commitment to drawings and design. Mission unique trade studies shall be completed prior to the MUPDR. The Contractor shall discuss analyses performed and their results along with comparisons to any similar proven designs. The Contractor shall evaluate the safety of the design and its ability to meet safety requirements. The preliminary design shall be subject to NASA's approval. NASA reserves the right to withhold approval until all action items have been closed. As a minimum, the Contractor shall provide verification of the following items at the MUPDR:

- (i) All system requirements have been allocated to the subsystem and component level and the flow down is adequate to verify system performance.
- (ii) The design solutions being proposed are expected to meet the performance and functional requirements.
- (iii) The design does not pose major problems that may cause schedule delays.

- (iv) Overall system architecture has been established and all launch vehicle to payload interfaces have been identified and are verifiable.
- (v) The design solution can be produced based on existing processes and techniques; if not, risk areas, which require unique and unproved processes, are identified and risk mitigation plans are established.
- (vi) An acceptable operations concept has been developed.
- (vii) Preliminary LV interfaces have been defined.
- (viii) Preliminary plans are established for end-to-end testing methodologies.
- (ix) 30% drawings released.

(C) Mission Unique Critical Design Review (MUCDR)

The Contractor shall conduct a MUCDR prior to design freeze and before significant fabrication activity begins. The Contractor shall present a final detailed design using drawings, analyses, and evaluation testing that shows the design meets final performance and interface specifications, safety requirements, and mission objectives. The Contractor shall provide selection criteria for the evaluation tests performed to prove validity. The critical design shall be subject to NASA's approval. NASA reserves the right to withhold approval until all action items have been closed. As a minimum, the Contractor shall provide verification of the following items at the MUCDR:

- (i) All technical problems and design anomalies have been resolved without compromising system performance, reliability and safety.
- (ii) The detailed design will meet performance, functional requirements, and schedule.
- (iii) Software simulations and prototyping results do not present any potential mission risks.
- (iv) All key subsystem and/or component engineering analyses are complete.
- (v) Integrated safety analysis identifying any remaining hazards and proposed resolution.
- (vi) Launch vehicle/payload compatibility test plans have been defined.
- (vii) 90% drawings released.

2.2.1.3 Readiness Reviews

The Mission Readiness Review, Launch Management Coordination Meeting (LMCM), Launch Readiness Review (LRR), and Flight Readiness Review (FRR) described herein will be conducted for each NASA mission.

(A) Mission Readiness Review

The Contractor shall conduct a Mission Readiness Review to demonstrate the launch site and launch vehicle are ready for payload mechanical and electrical integration. The Contractor shall conduct a LV walk-down [reference SOW Section 2.4.1.1(D)] with NNC participation prior to or in conjunction with the Mission Readiness Review. The Contractor shall present as a minimum:

- (i) Action item status and closure plan, safety status, payload mating plan, payload integration/launch site documentation, interface verifications, checkout and launch software status, nonconformance reports, launch site status, and review of flight profile.
- (ii) A detailed schedule showing all activities remaining to achieve an on-time launch.

(B) Launch Management Coordination Meeting (LMCM)

The Contractor shall participate in an LMCM conducted by NASA before each launch dress rehearsal or launch. The LMCM is used to ensure the readiness of the launch team to execute the procedures necessary to conduct the launch dress rehearsal (reference SOW Section 2.4.1.3) or launch. At this meeting, participant roles and responsibilities during countdown shall be identified. The Contractor shall develop and present a decision matrix for its launch team which defines who has authority to issue a GO, NO GO, and HOLD during launch countdown. The Contractor shall describe its launch day management activities, identify key team members, and define responsibilities and communications between the launch vehicle, NASA, and payload teams.

(C) Launch Readiness Review (LRR)

NASA will conduct/chair, and the Contractor shall participate in an LRR for each mission to ensure the specific launch vehicle is acceptable for flight and all Range and other mission requirements have been met, or will be satisfied prior to launch. The LRR is held approximately three days before launch. As a minimum, the Contractor shall provide verification that:

- (i) All critical items required to proceed into final launch countdown are ready.

- (ii) Vehicle configuration is defined and all vehicle systems have been verified per launch site test plans.
- (iii) All previously recorded action items have been closed or are reflected on the schedule.
- (iv) All previously held Contractor's readiness review actions have been closed or resolved.
- (v) Launch site/Range support organizations have committed to launch.
- (vi) Tracking and data support resources are committed to launch.
- (vii) Any open work is identified and closeout plans and schedules are in place and supportable.
- (viii) Any constraints to launch are identified and resolution plans developed.
- (ix) Mission risks are known and documented.
- (x) Launch commit criteria for payload and launch vehicle is approved and released.

The Contractor shall also discuss:

- (i) Anomalies from previous missions, including non-NASA missions
 - (ii) Hardware/software failures in the field either on our vehicle or in the fleet
 - (iii) Open corrective actions/problems reports
 - (iv) First flight items
- (D) Flight Readiness Review (FRR)

NASA will conduct/chair, and the Contractor shall participate in an FRR one day prior to launch to verify all actions from the LRR are complete and final processing has been successfully completed. NASA will appoint the chairperson for this review. At the conclusion of this review, an "approval to proceed with launch countdown" is given. Representatives from the Contractor, Range, and NNC agencies sign the Certificate of Flight Readiness. The Contractor shall prepare the Certificate of Flight Readiness. A sample Certificate of Flight Readiness is provided in Exhibit 4.

2.2.2 Risk Management

The Contractor shall implement risk management techniques that address the identification, analysis, mitigation, and tracking of potential impacts to mission success. The Contractor shall develop the criteria, methods, and procedures used for identifying critical items.

2.2.3 Configuration Management

The Contractor shall perform configuration management of the launch vehicle design and production for all launch vehicle components/subsystems, hardware, and software.

2.2.4 Manifest Policy

The Contractor shall develop a manifest policy that addresses the Contractor's overall approach to ensuring timely launch of payloads. The Contractor shall provide a five-year planning manifest to the Government (DRD C1-4) to support Government mission scheduling.

2.2.5 New Launch Vehicle Orientation

At the initiation of a new launch service the Contractor shall support an orientation briefing at KSC. This briefing shall introduce Contractor personnel and establish project interfaces with NASA personnel and describe the Contractor's organization and infrastructure. The briefing shall contain information summarizing the design, performance, fabrication, integration, testing, qualification and operational features of the launch vehicle systems and supporting facilities required to provide the launch service in the form of diagrams, schematics, pictures, drawings, videos, etc.

2.3 Mission Integration Services

2.3.1 Mission Integration Management

The Contractor shall be responsible for managing the mission integration of the payload flight and ground systems with the launch vehicle and its associated GSE. In accordance with this responsibility, the Contractor shall perform, as a minimum, the following services:

- (A) Provide a single point of contact with overall mission responsibility for each mission. This single point of contact shall be responsible for coordinating support from all technical disciplines and management during the integration process.
- (B) Conduct mission integration meetings (kick-off, working group, technical interchange) approximately quarterly from L-27 months to launch.

- (C) Provide a co-chairperson along with NASA for all working groups and technical interchange meetings. The Contractor co-chairperson shall be responsible for preparing and distributing agendas, minutes and action item logs for each meeting. The Contractor shall maintain the action item database and ensure closure of all actions.
- (D) Provide appropriate technical/engineering representation at payload preliminary and critical design reviews.
- (E) Plan, schedule, and manage mission analyses required to define and verify compatibility of the payload with the interface requirements and environments (reference Table D1-A, SOW paragraph 2.3.2).
- (F) Track development status of and resolve issues associated with mission specific hardware and software.
- (G) Coordinate interface and support requirements for the mission.
- (H) Plan/coordinate mission specific flight operations.
- (I) Manage integration activities at the launch site.
- (J) Manage and coordinate the launch vehicle safety approval process.
- (K) Prepare, maintain and implement a payload to launch vehicle ICD for each mission. Implement the ICD verification matrix. The ICD shall include all mission requirements including LV and launch site interface definition and environments. The ICD shall include the payload to LV/launch site electrical and mechanical interface drawings (DRD C2-1).
- (L) Manage the design, development, qualification, testing and integration of mission unique requirements.
- (M) As a non-standard service, evaluate the capability of the launch vehicle and define any performance and payload volume the Contractor may make available to NASA for secondary payloads.
- (N) Provide mission status to NNC throughout the launch campaign from Authority to Proceed (ATP) through mission success determination.

2.3.2 Mission Analyses

All vehicles provided under this contract shall include the following analysis for each mission as part of the standard launch service. The Contractor shall prepare and submit the standard mission analyses as listed in Table D1-A.

DRD	ANALYSIS
C4-1	Performance and Guidance Accuracy Analysis (3 submittals)
C4-2	Final Mission Analysis (FMA)
C4-3	Payload/Expended Stage Separation Analysis (2 submittals)
C4-4	Payload Fairing Venting Analysis
C4-5	Payload Fairing Clearance Analysis (3 submittals)
C4-6	Pre-Flight Controls and Stability Analysis
C4-7	Coupled Dynamic Loads Analysis (3 submittals)
C4-8	Integrated Thermal Analysis
C4-9	RF Link Analysis
C4-10	Payload/Launch Vehicle EMI/EMC and RF Compatibility Analysis

Table D1-A: Mission Analyses to Support Payload Integration

The standard launch service shall include all analyses required to support NPD 8710.3, NASA Policy for Limiting Orbital Debris assessment.

2.3.3 Mission Success Determination

Mission success will be based on the criteria set forth in Section C, paragraph 24.1, Mission Success Criteria. Mission success determination requirements are detailed in Section C, paragraph 24.2, Mission Success Determination.

The Contractor shall prepare and submit a Quick Look Flight Report (DRD C4-12) and a Final Flight Report (DRD C4-13). Within fifteen (15) days of receipt of the Final Flight Report, the Contracting Officer will either determine the launch a Mission Success or inform the Contractor of the Government's intent to withhold determination for payload evaluation.

2.4 Launch Site Support

2.4.1 Pre-Launch Checkout and Launch Support

2.4.1.1 Launch Vehicle Preparation and Launch

For launch services provided under this contract, the Contractor shall, as a minimum;

- (A) Perform all LV preparations and launch site operations necessary to safely and successfully deliver the payload to the desired orbit.
- (B) Generate the required documents and obtain all required safety approvals for the LV System and integrated payload/launch vehicle system operations including payload/LV system integration and launch operations.
- (C) Provide NASA insight, as defined in Article 25, to schedule meetings, test briefings, and technical meetings related to vehicle processing and hardware and software anomalies. Upon request, the Contractor shall provide copies of schedules, test briefings, and other material presented at technical meetings.
- (D) Conduct LV walk-downs with NNC participation.

2.4.1.2 Telemetry Data and Launch Countdown Support

2.4.1.2.1 Baseline Vehicle Support

The Contractor shall provide, in electronic and hard copy form, all raw LV telemetry (RF and hardwire) formats used in sufficient detail to allow NASA to process and verify the data (DRD C6-1). This shall include a detailed listing and description of all measurements and calibration coefficients for all LV telemetry (TM) links including the guidance system.

Upon NASA request, the Contractor shall provide NASA with a test tape representative of the telemetry (RF and hardwire) signals of the launch vehicle and GSE sufficiently prior to the initial power-up test on each mission to allow NASA to verify its ability to process the Contractor's telemetry (SDL S6-1). Upon NASA request, the Contractor shall submit an end-to-end link test plan (SDL S6-2). The Contractor shall ensure proper operation of all LV telemetry links (RF and hardwire), voice communication channels, and video to the NASA ground telemetry station prior to baseline launch vehicle processing. Upon NASA request, the Contractor shall provide an electronic copy and/or a magnetic tape of all significant vehicle test data (SDL S6-3). Upon NASA request, the Contractor shall provide real-time LV telemetry (RF and hardwire) data to NASA's ground telemetry station(s). Examples include, but are not limited to telemetry test data during initial vehicle power application, flight simulation prior to payload mate, and flight simulation following payload mate.

2.4.1.2.2 Integrated Support

Upon NASA request, the Contractor shall provide an electronic copy and/or a magnetic tape of all integrated test data (SDL S6-3). Upon NASA request, the Contractor shall provide real time integrated test telemetry (RF and hardwire) data to NASA's ground telemetry station(s).

2.4.1.2.3 Launch Countdown and Flight Support

The Contractor shall provide launch countdown procedures, Mission Constraints Documents (DRD C1-2) and a Mission Console Notebook (DRD C1-3).

The Contractor shall provide up to eight NASA personnel access to consoles, with vehicle monitoring capabilities, co-located within the launch control center. The Contractor shall provide access to real-time telemetry (RF and hardwire), voice communication channels with talk/listen capabilities, video and telephones for the co-located NASA personnel.

The Contractor shall deliver real-time LV telemetry (RF and hardwire), voice communication channels and video to the NASA ground telemetry station from the start of launch countdown through Range Loss of Signal (LOS) when in range of an existing ground receiving station, or as supplemented as described in SOW paragraph 2.4.3, Range Support and Services. NASA will be responsible for any distribution off base. If the LV telemetry, voice communication channels or video is uniquely encoded, the Contractor shall provide the decoded LV telemetry, voice communication channels, and video.

The Contractor shall receive and record the raw LV telemetry data for all phases of powered flight, from two (2) minutes prior to stage ignition through 60 seconds after payload separation. NASA shall provide any downrange telemetry support required if the Range utilized is unable to support with its existing ground assets. For all mandatory receive and record vehicle TM coverage times, real time transmission back to the NASA TM station shall be provided whenever possible. Post launch and upon request, the Contractor shall provide the raw telemetry data recorded (SDL S6-3).

During the Launch Countdown, the Contractor shall poll NASA at key milestone events for GO/NO-GO status. The final poll shall include the NASA Launch Manager's GO/NO-GO status for launch. The Contractor shall provide NASA access to anomalies and concurrence with anomaly resolution prior to proceeding with Launch Countdown. The Contractor shall poll NASA for any recycle of the Launch Countdown.

2.4.1.3 Launch Dress Rehearsal

The Contractor shall conduct a minimum of one Dress Rehearsal prior to launch. The rehearsal shall exercise the launch countdown procedure, and will have the participation of the NNC and LV Contractor launch teams. The rehearsal may use an abbreviated countdown script with simulated payload/vehicle conditions, including anomalies.

2.4.2 Launch Site Payload Support

2.4.2.1 Payload Processing Facility

For launches conducted from CCAFS, VAFB, and WFF, NASA will provide the Payload Processing Facility (PPF) unless processing services are purchased as a non-standard service. In the event (1) the Contractor proposes and NASA approves an alternate launch site, and (2) the alternate launch site is not a ferry site, the Contractor shall be responsible for providing a PPF, subject to NASA approval, meeting the payload requirements.

2.4.2.2 Launch Site Payload Integration Support

The Contractor shall provide all services, equipment, and support required for the integration and launch of each payload as agreed to in the Mission Unique Interface Control Document. Services shall include, as a minimum, the following:

- (A) Mating the payload with the LV, installing the payload fairing and performance of integrated checkout activities.
- (B) Verification of the end-to-end functionality of the umbilical lines provided for payload use.
- (C) Support for the installation and checkout of the payload GSE (provided by the payload customer) in the Orbital Carrier Aircraft (OCA) as defined in the Mission ICD. The Contractor shall also provide for a payload safety console at the launch control center.
- (D) Provision of the mountings for, and the installation of, the payload GSE (provided by the payload customer) in the OCA.
- (E) Provision for contingency off-loading of payload propellants as a mission-unique service in accordance with the appropriate Range Safety requirements and appropriate payload procedures.
- (F) Provision for launch site services to meet payload requirements agreed to in the Mission ICD such as: power, air conditioning, GN₂/GHe purges, and contamination control.
- (G) Support of all activities required to de-mate and to return the payload to the processing facility if necessary as a mission-unique service.
- (H) Preparation of the procedures for integrated LV/payload operations for NASA approval and incorporation of the payload procedures as appropriate (DRD C5-5).

- (I) Coordination of payload and LV operations into an integrated operational flow, preparation of the schedules, and provision of the schedules with updates as needed to NNC.
- (J) Provision of contamination control for payloads while they are in the possession of the Contractor, or in a Contractor-provided PPF per the SOW, paragraph 2.4.2.3.
- (K) Reserved
- (L) Certification of payload contamination control requirements for: fairing surface cleanliness, cleanroom environments, and purge system cleanliness.
- (M) Support for the installation of customer-provided RF re-radiating equipment as a mission-unique service.
- (N) Provision for the planning and execution of activities associated with the integrated testing of the customer's payload with the LV on the hot pad.

2.4.2.3 Contamination and Environmental Control

The Contractor shall provide and implement a generic payload contamination control plan and, if required, provide and implement a contamination control implementation plan for each payload. Using MIL-STD-1246C, MIL-PRF-27401D, FED-STD-209E, and NASA RP-1124 (Rev-4) as guidelines, the launch service shall meet the following minimum requirements:

- (A) Payload/Vehicle Integration Environment. For all Contractor-provided facilities where the payload resides and is exposed (including payload processing facilities and integration facilities), a 12'(W) x 24'(L) x 14'(H) Class 100,000 clean room environment per FED-STD-209E shall be provided. The environment within the cleanroom shall be maintained within a temperature and humidity range of 18 to 29 °C (64.4 to 84.2 °F) and ≤ 55%, respectively. Overhead crane lifts must occur outside the Class 100,000 clean room; therefore, the payload must be bagged or otherwise protected during lifting operations. The Contractor shall provide contamination and environmental monitoring when the payload is exposed. Following encapsulation of the payload within the fairing but prior to the transportation of the Pegasus launch vehicle to the Hot Pad, the fairing shall be purged with conditioned filtered air. The air temperature and relative humidity as measured within the air supply duct at the fairing inlet shall remain within a range of 18 to 29°C (64.4 to 84.2°F) and < 55% respectively. Air filtration shall be capable of removing 99.97% of all particles greater than 0.3 microns and removing 95% of all hydrocarbons with a molecular weight greater than 70. If required, Grade A, Type 1, GN₂ (or better) per MIL-PRF-27401D, may be used to purge the fairing environment in place of filtered air.

GN₂ purge or conditioned air shall not impinge directly on the payload at any point.

- (B) Transportation Environment. Following payload encapsulation and during transportation of the Pegasus launch vehicle to the Hot Pad, the fairing shall be purged with filtered and dried ambient air. The air temperature and relative humidity as measured within the air supply duct at the fairing inlet shall remain within a range of 2 to 29°C (35.6 to 84.2°F) and < 60% respectively. Air filtration shall be capable of removing 99.97% of all particles greater than 0.3 microns and removing 95% of all hydrocarbons with a molecular weight greater than 70. If required, Grade A, Type 1, GN₂ (or better) per MIL-PRF-27401D, may be used to purge the fairing environment in place of filtered air. GN₂ purge or conditioned air shall not impinge directly on the payload at any point.
- (C) Fairing Environment During Ground and Flight Operations. Following transportation of the Pegasus LV to the Hot Pad, the payload fairing shall be purged with conditioned filtered air. During ground operations, the temperature of the conditioned air, as measured in the ground air conditioner supply duct at the fairing inlet, shall be maintained within +/- 3°C (5.4°F) of a temperature setpoint, selectable by the payload, from 13 to 29 °C (55.4 to 84.2°F). The humidity of the conditioned air supply shall be maintained to ≤ 55%. Following the transition to the L1011 Airborne Air Conditioning System (AACS) in preparation for launch operations, the temperature of the conditioned air shall be measured in the AACS duct downstream of the filters. During the period of time prior to L1011 takeoff, the AACS air temperature shall be maintained within the range of 18 to 29 °C (64.4 to 84.2°F). When the L1011 is in flight, the AACS air temperature shall be maintained within +/- 3°C (5.4°F) of a temperature setpoint, selectable by the payload, from 18 to 29 °C (64.4 to 84.2°F). The humidity of the AACS air supply shall be maintained to ≤ 55% at all times. Ground and airborne air filtration shall be capable of removing 99.97% of all particles greater than 0.3 microns and removing 95% of all hydrocarbons with a molecular weight greater than 70. If required, Grade A, Type 1, GN₂ (or better) per MIL-PRF-27401D, may be used to purge the fairing environment in place of filtered air. GN₂ purge or conditioned air shall not impinge directly on the payload at any point.
- (D) Fairing Internal Surface Cleaning. The internal surfaces of the payload fairing shall be cleaned, certified, and maintained to MIL-STD-1246C Level 750A, or better.
- (E) Clean Room Garments. Personnel garments used, at a contractor facility, in the integration of the payload shall be provided and cleaned by the Contractor. Personnel garments used in the integration of the payload shall

comply with accepted clean room and personnel safety operating standards as specified in the mission specific contamination control plan.

- (F) Materials. All materials used in areas in close proximity to the payload shall be selected based on NASA RP-1124 (Rev-4). Materials shall have a Total Mass Loss (TML) of less than 1.0% and Collected Volatile Condensable Materials (CVCMM) of less than 0.10%, or be expressly identified and submitted to NASA for approval.

2.4.2.4 Operational Support Services

The Contractor shall provide safety training, instruction, and certification for all Contractor-operated or provided integration facilities and launch sites to ensure users are aware of facility, launch site, launch vehicle and payload hazards and have adequate knowledge to carry out their tasks unescorted in a safe manner. The Contractor shall provide access for payload personnel to the payload/LV or storage facilities to accommodate payload customer requirements. The Contractor shall provide security to meet the requirements for payload or personnel protection.

2.4.3 Range Support and Services

Launch vehicles provided under this contract shall include all hardware, software, analysis and support necessary to meet the requirements of EWR 127-1, Eastern/Western Range Safety Requirements.

As part of the launch service, the Contractor shall make all launch Range support arrangements for: scheduling Range for launch and integrated testing, Range Safety functions, communications and timing, metric C-band beacon (radar) coverage, telemetry coverage, camera coverage of launch, and tracking and telemetry station acquisition predictions. If required, NASA will provide down range telemetry aircraft, Tracking and Data Relay Satellite System (TDRSS) and/or NASA owned ground station support for tracking and data recovery. The Contractor shall be responsible for coordinating and ensuring all tracking and data recovery support meets mission requirements (DRDs C2-3 and C2-4).

The Contractor shall make arrangements for Range provided services necessary to support the launch service. As a minimum, the following services are to be provided: fluids, gases, propellants, ordnance storage, facility usage, equipment support, shop and laboratory services, meteorology, base security, fire protection and environmental health. Payload-unique Range services will be provided as a mission-unique service.

The mission specific Program Requirements Document/Operational Requirements (PRD/OR)(DRD C2-2), or equivalent mission specific Range support documentation, shall be submitted to obtain Range support. The

Contractor, with support from NASA, shall complete all forms pertinent to the mission and submit them to the appropriate Range for formal acceptance.

2.5 Safety, Reliability, and Quality Assurance

During the period of performance the Contractor shall establish, implement, and maintain comprehensive safety and health, reliability and quality assurance programs covering program management, mission integration management, and the design, development, production, test, integration and launch of the LVS.

2.5.1 Safety and Health Program

The Contractor shall provide a Safety and Health Plan that will implement safety requirements consistent with federal, state, and local government regulations and applicable NASA and Range Safety and Health requirements. This Plan shall describe the Safety organization including structure of management interfaces. Methods employed to ensure compliance with applicable safety requirements shall be identified in accordance with EWR 127-1. When the contractor is performing work in any NASA owned or operated facility (e.g., buildings 836 and 1610 at VAFB, SAEF-2 and PHSF at KSC), all NASA requirements and documentation as contained in the SOW, paragraph 1.3, Compliance Documents, shall be adhered. Each Contractor employee on NASA property, or custodian of NASA assets elsewhere, is responsible for reporting mishaps (DRD C3-2). The Contractor shall make provisions for NASA safety representative insight into integrated Payload/LV processing. For launches at the Eastern Range and Western Range any agreements between the contractor and the Range for a tailored EWR 127-1 are acceptable to NASA. Likewise, any Range Safety Agreements between the Contractor and WFF are acceptable to NASA.

The Contractor shall implement a system safety program, which identifies and controls system/subsystem hazards that affect personnel, flight hardware and facilities.

2.5.2 Reliability Program

The Contractor shall implement and maintain a Reliability Program with an overall vehicle design reliability of no less than 95% at an 80% confidence factor. The Contractor's program shall facilitate evaluation of the Contractor and subcontractor's programs to determine if the product meets the overall design reliability requirements. Overall vehicle reliability predictions shall be incrementally revised to reflect design modifications.

2.5.3 Quality Assurance Program

The Contractor shall maintain a quality management system that is ISO 9001/2000 third party certified. The Registrar shall be accredited by either the

International Registrar of Certified Auditors (IRCA) or the Registrar Accreditation Board (RAB). In the event the Contractor certification is revoked, NASA shall be notified within 5 business days (DRD C3-3).

The Contractor shall maintain a Software Assurance Program using ISO 9001/2000-3 as a guideline.

The Contractor shall accommodate NASA participation in Contractor and subcontractor ISO audits. NASA insight will consist of monitoring audits with the Contractor's auditors and inspectors in order to provide understanding of the Contractor's quality system and insight of their processes.

The Contractor shall support NASA performance of ISO 2nd party audits, as required. The audits will be performed in accordance with ISO 10011 requirements. The Contractor shall provide a current Audit Plan and schedule for in-house and sub-Contractor audits upon request from NASA (DRD C3-4). The Contractor shall provide a copy of both the Contractor performed internal Quality Audit Report and the subcontractor/vendor Quality Audit Reports (DRD C3-5), when requested by NASA.

The Contractor shall provide for NASA attendance at any flight hardware reviews the Contractor performs at Contractor or subcontractor facilities. The Contractor shall make available to NASA any build paper, test results, nonconformance reports, discrepancy history, statistical process control, and failure analyses that are relevant to the reviews.

The Contractor shall provide NASA remote terminal access (via a secure HTTPS (FTP) website updated daily) to the following existing quality assurance databases: Discrepancy Reports (DRs); Root Cause/Corrective Actions (RCCAs); Limited Life Item lists; As Designed As Built (ADAB) database; active, approved software problem report (SPR) lists; and Orbital-generated alerts (technical and sibling).

The contractor shall provide NASA all anomaly resolutions that affect the integrated payload/launch vehicle assembly, including both hardware and software. NASA will approve all integrated payload/launch vehicle anomaly resolutions. The contractor shall provide insight to Material Review Board (MRB) and failure reporting for all criticality 1 anomalies.

The Contractor shall participate in the Government/Industry Data Exchange Program (GIDEP) and provide Alert System Documentation (DRD C3-1).

2.6 NASA Insight and Approval

The Contractor shall comply with the Government's implementation of NPD 8610.23 and NPD 8610.24 as defined under Section C, Clause 25.0 and the

SOW paragraph 2.2.1, Formal Reviews. As part of the standard launch service, the Contractor shall provide the data, documentation, drawings, analytical models, and support services as necessary to accommodate the requirements specified under contract Section C, Clause 25.0, Government Insight and Approval.

The Contractor shall notify NASA of qualification or test anomalies involving similar launch vehicles, systems, subassemblies and components. The Contractor shall make available to NASA all problem reports or discrepancy reports on LV systems' failures and anomalies. This shall include insight into fleet-wide problems, anomalies, MRB actions, deviations or waivers to systems, subsystems, materials, processes, and test equipment including those used on non-NASA missions.

In the event of an anomaly or launch failure, the Contractor shall support NASA's Failure Review Board, if activated, or shall allow NASA to fully participate in the Contractor's Failure Investigation Board including those for non-NASA missions.

NASA may elect to have representation as a resident office at the Contractor's major manufacturing and engineering facilities for the life of the contract. The Contractor shall provide accommodations and services, such as badging, furniture, telephones, and use of easily accessible fax, viewgraph, and copy machines from one to three residents and up to four visitors. A minimum of two voice and two data phone lines shall be provided. Electronic data transfer compatibility between the resident office and off-site NASA institutions is required. A 'Resident Office' will not be required at CCAFS or VAFB, but NASA will require operational support accommodations (i.e. office space, power, phone, communication boxes for monitoring vehicle testing, etc.) at the launch complex during NASA launch operations.

3.0 NON-STANDARD SERVICES

The Contractor shall provide the non-standard services identified in Exhibit 3 as directed by the Contracting Officer. Implementation of all non-standard services shall be fully compliant with this SOW.

4.0 MISSION UNIQUE REQUIREMENTS

The Contractor shall provide the mission unique services identified in Exhibit 5 as directed by the Contracting Officer. Implementation of all mission unique services shall be fully compliant with this SOW.

4.1 Mission Unique Hardware

The Contractor shall design, manufacture, test, and qualify for flight the mission unique hardware that is required to support the payload and mission. The Contractor shall prepare and submit drawings (DRD C5-4), test plans (DRD C5-2), and test reports (DRD C5-3) to support NASA insight and approval of mission unique hardware.

For vehicle changes initiated by the Contractor that are not fleet-wide changes, the Contractor shall prepare and submit a vehicle data package (DRD C5-1).

The Contractor shall use MIL-STD-1540 B or C as a guideline when developing environmental qualification and acceptance criteria and related test and analysis. Factors of safety for mission unique hardware shall meet the requirements of Table D1-B.

Application	Test		Analysis (No Test)	
	Yield	Ultimate	Yield	Ultimate
Non-Man Rated	1.10	1.25	1.65	1.90

Table D1-B: Mission Unique Hardware Factors of Safety

4.2 Mission Unique Software

The Contractor shall provide source code and mission constants' listings (DRD C4-11) with appropriate requirement specifications to support NASA approval of mission unique software. The Contractor shall prepare and submit a pre-flight control system and stability analysis report (DRD C4-6) for the vehicle and mission unique software used for each mission.

4.3 Unanticipated Mission Unique Services

At the time of contract award, the Government may not have identified all mission unique services required for each mission. As unanticipated mission unique services are identified, the Contracting Officer will authorize the Contractor, in accordance with FAR 52.243-1, Changes – Fixed Price Alt I, to perform these services. In performing unanticipated mission unique services, the Contractor shall design the necessary ground and flight hardware/software; conduct appropriate design reviews; and manufacture, test and qualify for flight LV mission unique hardware/software, i.e., other than that provided as a standard service (Exhibit 2) or described in the non-standard services list (Exhibit 3).

5.0 SPECIAL TASK ASSIGNMENTS

The Contractor shall be required to perform special studies and analyses, provide materials, or fabricate hardware in support of this contract. Each task will be initiated by written direction from the NASA Contracting Officer. These tasks generally include: advance planning and feasibility studies in support of future contemplated missions; analyses in support of change requirements to authorized missions; development, fabrication, and test of hardware/software to support planning studies or special tests; mission unique studies; material provision; and hardware fabrication in support of potential missions prior to mission authorization.

6.0 INFORMATION TECHNOLOGY SECURITY

The contractor shall comply with NPG 2810.1, NASA's Security on information Technology Guideline. Existing systems retained by the contractor, shall be brought into compliance within six months of the contract start date. New systems shall be compliant prior to authorization to process. The contractor shall develop, update and implement an IT Security Plan. NASA IT Security personnel will perform the penetration testing requirements of NASA STD NPG 2810.1 section 4.6 per KDP-KSC-P-1334.

7.0 GUIDELINE DOCUMENTS

The following documents are to be used as guidelines to the extent specified in this SOW.

Document No	Rev.	Document Title
AFSPCI 10-1213	7/1/98	Spacelift Launch Strategy and Scheduling Procedures FED-STD 209 Documents cancelled and replaced by two documents below
ISO 14644-1:1999 (E)		Clean rooms and associated controlled environments – Part 1: classification of air cleanliness
ISO 14644-2:2000(E)		Clean rooms and associated controlled environments – Part 2: specifications for testing and monitoring to prove continued compliance with ISO 14644-1
IRIG-106-99		Telemetry Standards
ISO 9001/2000-3		Application of ISO 9001/2000 to Software Development
ISO 10011		Guidelines for Auditing Quality System
JSC SN-C-0005	D	Space Shuttle Contamination Control Requirements
MIL-STD-1553 ¹	B	Digital Time Division Command/Response Multiplex Data Bus
MIL-STD-1540	B or C	Test Requirements for Launch, Upper-Stage, and Space Vehicles
MIL-STD-176	A, Notice 1	Weight and Balance Data Reporting Forms for Guided Missiles and Space Launch Vehicles
MIL-STD-1773	Notice 1	Fiber Optics Mechanization of an Aircraft Internal Time Division Command/Response Multiplex Data Bus
IEST-STD-CC1246	C, 3	Product Cleanliness Levels and Contamination Control Program
MIL-PRF-27401	D	Performance Specification, Propellant Pressurizing Agent, Nitrogen
NASA RP-1124	4	Outgassing Data for Selecting Spacecraft Materials

8.0 REFERENCE DOCUMENTS

The following documents are hereby incorporated by reference. The Contractor shall comply with the Government's implementation of these policies and instructions.

Document No.	Document Title
NPD 8610.23a	NASA Insight and Approval (Expired version, new NPD in review process)
NPD 8610.24a	Expendable Launch Vehicle (ELV) Launch Services Pre-launch Reviews (Expired version, new NPD in review process)
NPD 8610.7a	Launch Services Risk Mitigation Policy for NASA-Owned or NASA-Sponsored Payloads
PMI K-ELV-10.2	ELV Program Management Instruction for Launch Vehicle Qualification

ATTACHMENT D1B

**TAURUS
STATEMENT OF WORK**

ATTACHMENT D1B

STATEMENT OF WORK

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STATEMENT OF WORK

1.0 INTRODUCTION

1.1 Scope

This Statement of Work (SOW) and all Exhibits and documents attached or referenced herein define the Government's requirements for the Contractor to provide launch services in support of NASA's Launch Services Program Office (LSPO). The scope of this contract effort includes risk category 2 and 3 launch services capable of delivering, at a minimum, a 250 kg payload to orbit at an altitude of 200 km and a launch inclination of 28.5°.

This SOW defines the overall launch service requirements for 'NASA or NASA-sponsored payloads' (hereinafter referred to as 'payloads'). The Contractor shall perform all tasks necessary, consistent with the terms and conditions of this contract and the SOW provisions identified herein, to safely and reliably launch payloads in accordance with NASA-defined mission objectives. The Contractor shall support advanced planning and perform analysis tasks as directed by the Contracting Officer.

It is the general contemplation of the parties to this contract that the Contractor shall have a broad mission in performing launch service related functions for the Government and designees. Therefore, the general scope of the contract covers any launch service and launch service related activities arising from the SOW in support of earth and space science exploration, and space station re-supply.

1.2 Objectives

The goal of the NASA Launch Services (NLS) contract is to provide the Agency with domestic launch services that are safe, successful, reliable, and affordable. The launch services will be provided at a fixed price. The contract will, to the maximum extent practical, incorporate best commercial practices.

The objectives of this contract are to:

- Ensure the safety of the public and all personnel, hardware, and property associated with the launch services.
- Provide affordable, accurate, and on-time delivery of LSPO manifested payloads to space.
- Provide a mechanism to incorporate new launch services, technology upgrades, improved systems engineering processes, and advances in manufacturing techniques.

- Provide risk mitigation while utilizing commercial practices.
- Provide flexible manifesting policy that recognizes the national priorities of NASA missions.
- Provide a capability to optimize cost, schedule, and performance to satisfy mission objectives.
- Provide for clear Government visibility into program schedule, technical performance, and risk.
- Foster competition and create opportunities for new, emerging launch service providers.
- Promote partnering among customers, launch service provider, and the LSPO program to maximize flexibility and responsiveness to customers needs.

1.3 Compliance Documents -

The Contractor shall comply with the requirements contained in the following documents.

Document No.	Revision	Document Title
EWR 127-1	Dec 1999	Eastern/Western Range, Range Safety Requirements ¹ (Required for VAFB or CCAS launches only)
ISO 9001/2000-2000		International Organization of Standardization
NPR 8715.3	31 May 2004	NASA Safety Manual w/Change 2 ^{2,3}
NPD 8710.3	B, April 2004	NASA Policy For Limiting Orbital Debris ⁴
NASA-STD-8719.9	May 2002	NASA Safety Standard for Lifting Devices and Equipment ²

¹ Any agreements between the Contractor and the Range for a tailored EWR 127-1 are acceptable to NASA.

² The Contractor shall comply with of NPR 8715.3 and NASA-STD-8719.9 for processes performed in NASA facilities.

- ³ Any agreement between the Contractor and NASA for a tailored KHB 1710.2 are acceptable.
⁴ Contractor will provide required data necessary for NASA to perform assessment.

1.4 Definitions

Mission Specific: all standard, non-standard, and mission unique services provided to meet the requirements of the payload and mission.

Mission Unique: services provided that are newly performed or developed to meet mission requirements and that are not included in the standard and non-standard services. Typically these pertain to first flight items.

2.0 STANDARD LAUNCH SERVICE

The Contractor shall perform all launch service tasks necessary to deliver payloads to defined orbital parameters in compliance with mission requirements. The launch service shall support missions to all orbital parameters, consistent with vehicle configuration capabilities and launch Range restrictions. The Contractor shall provide launch services, which are in compliance with all Range requirements. The Contractor shall make all arrangements with the responsible authorities for the required launch Range authorization and support for vehicle processing; integrated payload/vehicle processing, launch; and launch site maintenance and modifications. NASA reserves the right to approve the choice of launch site [e.g. Cape Canaveral Air Force Station (CCAFS), Vandenberg Air Force Base (VAFB)].

The Contractor shall furnish all services, maintain all equipment and infrastructure including, but not limited to: program management, mission integration, launch site support, ground and flight system safety, and performance assurance, necessary to accomplish the safe and successful launch of payloads to the required orbit conditions within required launch periods. The Contractor shall provide facilities and services at Contractor facilities for NASA personnel performing insight and approval functions during the performance of the contract. The Contractor shall provide access to launch vehicle documentation in support of NASA insight and approval functions.

The Contractor shall provide all necessary services, test hardware and software, and mission specific elements required to integrate the payload(s) to the launch vehicle systems. The Contractor shall meet all launch service performance requirements described in Exhibit 1, Capabilities, Specifications and Environments. All capabilities and conditions stated in Exhibit 1 must be consistent and compatible with all other capabilities and conditions stated in Exhibit 1 and in response to the requirements of the SOW. Any exceptions to the stated capabilities or conditions must be specifically noted.

The Contractor shall coordinate with NASA Public Affairs Office all press releases concerning launches under this contract. During vehicle build-up, payload integration, and launch countdown, the Contractor shall allow NASA Public Affairs access to facilities to photograph and videotape activities, including hazardous operations. The Contractor shall assist NASA Public Affairs in developing the launch commentary for NASA Television by furnishing launch countdown and operations background material. The Contractor may also be asked to provide information to support the development of the press kit document and the NASA pre-launch and post-launch news conferences. The Contractor shall coordinate with NASA Public Affairs Protocol and Guest Services a minimum of sixty (60) days in advance of each launch to determine any special requirements.

The Contractor shall provide standard launch services as delineated in Exhibit 2, Standard Services List. All hardware, software, analyses, and support required to provide each item listed in Exhibit 2, shall be included in the standard launch service.

All Data Requirements List (DRL) and Supplemental Data List (SDL) items, identified in Attachment D2 and D3 respectively, shall be included in the standard launch service.

2.1 Launch Vehicle (LV)

The standard launch service shall include, as a minimum, the following:

- (A) Launch timing capabilities with
 - (i) Launch periods from the encapsulated payload arrival at the launch pad to launch in as small as 20 days in duration
 - (ii) Multiple approximately 24 hour re-launch attempts in the event of a launch scrub (with exception of abort inside 16 seconds)
 - (iii) Launch window as short as 2 seconds
 - (iv) Simultaneous planetary launch campaigns, with launches separated by approximately 30 days from same site
- (B) A launch vehicle and Payload Adapter (PA) with appropriate electrical and mechanical interfaces (as described in Exhibit 1) required for payload integration and testing.
- (C) A payload separation system with the following characteristics:
 - (i) The payload shall be protected from debris generated by the separation system.

- (ii) The separation system shall function in a manner that prevents any re-contact with the payload, including Contractor-provided attach hardware on the payload, by the upper stage or any element of the separation system once separation has been initiated.
 - (iii) Redundant payload separation indications.
- (D) A Payload Fairing (PLF) with the following items, as a minimum:
- (i) Three payload access doors of sizes 305 mm x 305 mm (12 in. x 12 in.) for the 63" fairing and 457 mm x 610 mm (18 in. x 24 in.) for the 92" fairing, whose locations shall be mission unique within the stated structural limitations of the fairing (defined in Exhibit 1). Additional or different size doors shall be provided as a non-standard service. The Contractor shall provide payload personnel access through all standard and non-standard access doors from fairing mate through final vehicle closeout.
 - (ii) Thermal environments of the upper stage motor (with a view factor to the payload) shall not exceed 177°C (351°F). Maximum thermal environments shall be specified in the mission specific ICD (DRD C2-1).
 - (iii) Acoustic blankets sealed or filtered such that venting of blanket material debris does not contaminate the payload.
- (E) Flight instrumentation, as specified in Exhibit 1, paragraph 9.0, Payload Environment Instrumentation, to provide data adequate to support Section C, paragraph 24.2, Mission Success Determination.
- (F) Capability to spin and despin payloads, when applicable, prior to deployment over a minimum range of zero (0) to 355 degrees per second with an accuracy of ± 2 degrees per second of the target rate.
- (G) A Collision/Contamination Avoidance Maneuver (CCAM), when applicable, following payload separation to minimize payload contamination and any chance of re-contact with the separated payload.
- (H) Provisions for the prevention of static charging on umbilical connectors that may be subjected to static charging from plasma heating or atmospheric particulate matter, either by bleed resistors, dead facing or connector covers.
- (I) Decals of a NASA logo and mission patch in accordance with NASA provided artwork. The size of the logo shall be a maximum of 24 in. x 24 in. The size of the mission patch shall be a maximum of 42 in. high and 36 in. wide (63" fairing) or 54 in. high and 60 in. wide (92" fairing). The logo

installation shall be appropriately documented in the mission Interface Control Document (ICD) (DRD C2-1).

- (J) Availability of a Test Payload Adapter (TPA), with appropriate mechanical interfaces and payload separation system, to support payload integration and testing at NASA/NASA Customer (NNC) facilities (within the continental United States) or such other locations as defined by the ICD. At this facility, the Contractor shall support, with necessary personnel and equipment, the following: a fit check of the payload with the flight PA, two consecutive weeks of environmental testing with a TPA using the flight separation system, one week of consecutive payload shock testing with a TPA using the flight separation system, and sufficient pyrotechnics for two shock test firings. Given that the flight separation system is used, Orbital must approve proposed environmental testing and the last pyrotechnic release test must occur no later than ten (10) weeks prior to flight integration.
- (K) Command, control, and power signal capability from the launch control facility to the payload umbilical Ground Support Equipment (GSE) per the mission specific ICD.
- (L) All mechanical GSE required to interface with the payload mechanical adapters and accomplish the payload to launch vehicle mating operation per the mission ICD.
- (M) Both halves of the electrical connector at each spacecraft-to-launch vehicle interface. The Contractor shall provide 3 sets for each electrical connector interface: a flight set, a flight spare set, and a set for spacecraft testing.
- (N) All other hardware equipment, software, infrastructure, and logistics necessary to perform the contracted launch services.

2.2 Program Management

The Contractor shall provide all program management functions required to provide the launch services and to satisfy the mission requirements for each NASA mission. The program management function of this contract shall provide insight to NASA for all technical and programmatic activities performed under this contract.

The Contractor shall coordinate all program management functions and issues directly with the KSC LSPO designated representative(s). The NASA Contracting Officer is the only NASA representative authorized to provide formal contract direction.

2.2.1 Formal Reviews

The Contractor shall conduct program reviews, design reviews, and readiness reviews, and shall provide for the participation of NNC. The Contractor shall provide minutes and action items resulting from each review to NASA within one week after the review. A copy of the presentation material shall be available at the review for all NNC attendees (DRD C1-1).

2.2.1.1 Program Reviews

During the contract performance period, the Contractor shall conduct Program Reviews with NASA at least once per year to: report development and production status, ensure schedules support program objectives, review action items, review program schedules, and discuss any issues. The intent of the program review is to provide a forum for open dialog between NASA and the Contractor with respect to launch services. NASA will provide status of Agency direction at the reviews. The review location shall alternate between NASA and Contractor facilities unless mutually agreed upon to do otherwise.

2.2.1.2 Design Reviews – Mission Unique

The Contractor shall conduct and chair/co-chair design reviews, as described below, that apply to the system, subsystem, component, and software level for all first flight mission unique items. Where there is not a direct match between a SOW specified mission unique design review(s) and the Contractor's standard review(s), the Contractor's review process will be acceptable provided it addresses equivalent content. For items previously flown, the following design reviews will not be required, provided the Contractor allows insight into design and prior performance of each item.

(A) Mission Unique Requirements Review (MURR)

The Contractor shall conduct a MURR prior to the Mission Unique Preliminary Design Review (MUPDR) with NNC to review the mission unique design requirements for the following items:

- (i) System requirements' identification and definition to a level adequate to verify launch vehicle performance capabilities.
- (ii) Design restrictions, limitations, and known violations.
- (iii) Physical and mechanical interfaces (e.g., payload to launch vehicle, payload envelope, and access provisions).

- (iv) Electrical interfaces (e.g., launch vehicle to payload, payload to umbilical, interfaces with electrical ground support equipment, pad electrical systems, ground batteries, telemetry, grounding, and power).
- (v) Functional interfaces (e.g., structures, structural loads, and vibration).
- (vi) Avionics systems and interfaces (e.g., payload avionics interfaces with launch vehicle, separation systems, telemetry interfaces, payload command and telemetry, and RF).
- (vii) Mass properties.
- (viii) Environmental requirements (e.g., thermal, contamination, vibration, pressure, Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC), shock, launch complex RF, and lightning).
- (ix) Orbital requirements, launch vehicle performance, launch window, injection accuracy, and deployment attitudes and rates.
- (x) Payload/Launch Vehicle (LV) separation requirements (e.g., separation conditions, launch vehicle post-separation maneuver requirements, and telemetry).

(B) Mission Unique Preliminary Design Review (MUPDR)

The Contractor shall conduct a preliminary detailed design review prior to major commitment to drawings and design. Mission unique trade studies shall be completed prior to the MUPDR. The Contractor shall discuss analyses performed and their results along with comparisons to any similar proven designs. The Contractor shall evaluate the safety of the design and its ability to meet safety requirements. The preliminary design shall be subject to NASA's approval. NASA reserves the right to withhold approval until all action items have been closed. As a minimum, the Contractor shall provide verification of the following items at the MUPDR:

- (i) All system requirements have been allocated to the subsystem and component level and the flow down is adequate to verify system performance.
- (ii) The design solutions being proposed are expected to meet the performance and functional requirements.
- (iii) The design does not pose major problems that may cause schedule delays.

- (iv) Overall system architecture has been established and all launch vehicle to payload interfaces have been identified and are verifiable.
- (v) The design solution can be produced based on existing processes and techniques; if not, risk areas, which require unique and unproved processes, are identified and risk mitigation plans are established.
- (vi) An acceptable operations concept has been developed.
- (vii) Preliminary LV interfaces have been defined.
- (viii) Preliminary plans are established for end-to-end testing methodologies.
- (ix) 30% drawings released.

(C) Mission Unique Critical Design Review (MUCDR)

The Contractor shall conduct a MUCDR prior to design freeze and before significant fabrication activity begins. The Contractor shall present a final detailed design using drawings, analyses, and evaluation testing that shows the design meets final performance and interface specifications, safety requirements, and mission objectives. The Contractor shall provide selection criteria for the evaluation tests performed to prove validity. The critical design shall be subject to NASA's approval. NASA reserves the right to withhold approval until all action items have been closed. As a minimum, the Contractor shall provide verification of the following items at the MUCDR:

- (i) All technical problems and design anomalies have been resolved without compromising system performance, reliability and safety.
- (ii) The detailed design will meet performance, functional requirements, and schedule.
- (iii) Software simulations and prototyping results do not present any potential mission risks.
- (iv) All key subsystem and/or component engineering analyses are complete.
- (v) Integrated safety analysis identifying any remaining hazards and proposed resolution.
- (vi) Launch vehicle/payload compatibility test plans have been defined.
- (vii) 90% drawings released.

2.2.1.3 Readiness Reviews

The Mission Readiness Review, Launch Management Coordination Meeting (LMCM), Launch Readiness Review (LRR), and Flight Readiness Review (FRR) described herein will be conducted for each NASA mission.

(A) Mission Readiness Review

The Contractor shall conduct a Mission Readiness Review to demonstrate the launch site and launch vehicle are ready for payload mechanical and electrical integration. The Contractor shall conduct an LV/site walk-down [reference SOW Section 2.4.1.1(D)] with NNC participation prior to or in conjunction with the Mission Readiness Review. The Contractor shall present as a minimum:

- (i) Action item status and closure plan, safety status, payload mating plan, payload integration/launch site documentation, interface verifications, checkout and launch software status, nonconformance reports, launch site status, and review of flight profile.
- (ii) A detailed schedule showing all activities remaining to achieve an on-time launch.

(B) Launch Management Coordination Meeting (LMCM)

The Contractor shall participate in an LMCM conducted by NASA before each launch dress rehearsal or launch. The LMCM is used to ensure the readiness of the launch team to execute the procedures necessary to conduct the launch dress rehearsal (reference SOW Section 2.4.1.3) or launch. At this meeting, participant roles and responsibilities during countdown shall be identified. The Contractor shall develop and present a decision matrix for its launch team which defines who has authority to issue a GO, NO GO, and HOLD during launch countdown. The Contractor shall describe its launch day management activities, identify key team members, and define responsibilities and communications between the launch vehicle, NASA, and payload teams.

(C) Launch Readiness Review (LRR)

NASA will conduct/chair, and the Contractor shall participate in an LRR for each mission to ensure the specific launch vehicle is acceptable for flight and all Range and other mission requirements have been met, or will be satisfied prior to launch. The LRR is held approximately three days before launch. As a minimum, the Contractor shall provide verification that:

- (i) All critical items required to proceed into final launch countdown are ready.

- (ii) Vehicle configuration is defined and all vehicle systems have been verified per launch site test plans.
- (iii) All previously recorded action items have been closed or are reflected on the schedule.
- (iv) All previously held Contractor's readiness review actions have been closed or resolved.
- (v) Launch site/Range support organizations have committed to launch.
- (vi) Tracking and data support resources are committed to launch.
- (vii) Any open work is identified and closeout plans and schedules are in place and supportable.
- (viii) Any constraints to launch are identified and resolution plans developed.
- (ix) Mission risks are known and documented.
- (x) Launch commit criteria for payload and launch vehicle is approved and released.

The Contractor shall also discuss:

- (i) Anomalies from previous missions, including non-NASA missions
- (ii) Hardware/software failures in the field either on our vehicle or in the fleet
- (iii) Open corrective actions/problems reports
- (iv) First flight items

(D) Flight Readiness Review (FRR)

NASA will conduct/chair, and the Contractor shall participate in an FRR one day prior to launch to verify all actions from the LRR are complete and final processing has been successfully completed. NASA will appoint the chairperson for this review. At the conclusion of this review, an "approval to proceed with launch countdown" is given. Representatives from the Contractor, Range, and NNC agencies sign the Certificate of Flight Readiness. The Contractor shall prepare the Certificate of Flight Readiness. A sample Certificate of Flight Readiness is provided in Exhibit 4.

2.2.2 Risk Management

The Contractor shall implement risk management techniques that address the identification, analysis, mitigation, and tracking of potential impacts to mission success. The Contractor shall develop the criteria, methods, and procedures used for identifying critical items.

2.2.3 Configuration Management

The Contractor shall perform configuration management of the launch vehicle design and production for all launch vehicle components/subsystems, hardware, and software.

2.2.4 Manifest Policy

The Contractor shall develop a manifest policy that addresses the Contractor's overall approach to ensuring timely launch of payloads. The Contractor shall provide a five-year planning manifest to the Government (DRD C1-4) to support Government mission scheduling.

2.2.5 New Launch Vehicle Orientation

At the initiation of a new launch service the Contractor shall support an orientation briefing at KSC. This briefing shall introduce Contractor personnel and establish project interfaces with NASA personnel and describe the Contractor's organization and infrastructure. The briefing shall contain information summarizing the design, performance, fabrication, integration, testing, qualification and operational features of the launch vehicle systems and supporting facilities required to provide the launch service in the form of diagrams, schematics, pictures, drawings, videos, etc.

2.3 Mission Integration Services

2.3.1 Mission Integration Management

The Contractor shall be responsible for managing the mission integration of the payload flight and ground systems with the launch vehicle and its associated GSE. In accordance with this responsibility, the Contractor shall perform, as a minimum, the following services:

- (A) Provide a single point of contact with overall mission responsibility for each mission. This single point of contact shall be responsible for coordinating support from all technical disciplines and management during the integration process.
- (B) Conduct mission integration meetings (kick-off, working group, technical interchange) approximately quarterly from L-27 months to launch

- (C) Provide a co-chairperson along with NASA for all working groups and technical interchange meetings. The Contractor co-chairperson shall be responsible for preparing and distributing agendas, minutes and action item logs for each meeting. The Contractor shall maintain the action item database and ensure closure of all actions.
- (D) Provide appropriate technical/engineering representation at payload preliminary and critical design reviews.
- (E) Plan, schedule, and manage mission analyses required to define and verify compatibility of the payload with the interface requirements and environments (reference Table D1-A, SOW paragraph 2.3.2).
- (F) Track development status of and resolve issues associated with mission specific hardware and software.
- (G) Coordinate interface and support requirements for the mission.
- (H) Plan/coordinate mission specific flight operations.
- (I) Manage integration activities at the launch site.
- (J) Manage and coordinate the launch vehicle safety approval process.
- (K) Prepare, maintain and implement a payload to launch vehicle ICD for each mission. Implement the ICD verification matrix. The ICD shall include all mission requirements including LV and launch site interface definition and environments. The ICD shall include the payload to LV/launch site electrical and mechanical interface drawings (DRD C2-1).
- (L) Manage the design, development, qualification, testing and integration of mission unique requirements.
- (M) As a non-standard service, evaluate the capability of the launch vehicle and define any performance and payload volume the Contractor may make available to NASA for secondary payloads.
- (N) Provide mission status to NNC throughout the launch campaign from Authority to Proceed (ATP) through mission success determination.

2.3.2 Mission Analyses

All vehicles provided under this contract shall include the following analysis for each mission as part of the standard launch service. The Contractor shall prepare and submit the standard mission analyses as listed in Table D1-A.

DRD	ANALYSIS
C4-1	Performance and Guidance Accuracy Analysis (3 submittals)
C4-2	Final Mission Analysis (FMA)
C4-3	Payload/Expended Stage Separation Analysis (2 submittals)
C4-4	Payload Fairing Venting Analysis
C4-5	Payload Fairing Clearance Analysis (3 submittals)
C4-6	Pre-Flight Controls and Stability Analysis
C4-7	Coupled Dynamic Loads Analysis (3 submittals)
C4-8	Integrated Thermal Analysis
C4-9	RF Link Analysis
C4-10	Payload/Launch Vehicle EMI/EMC and RF Compatibility Analysis

Table D1-A: Mission Analyses to Support Payload Integration

The standard launch service shall include all analyses required to support the NPD 8710.3, NASA Policy for Limiting Orbital Debris assessment.

2.3.3 Mission Success Determination

Mission success will be based on the criteria set forth in Section C, paragraph 24.1, Mission Success Criteria. Mission success determination requirements are detailed in Section C, paragraph 24.2, Mission Success Determination.

The Contractor shall prepare and submit a Quick Look Flight Report (DRD C4-12) and a Final Flight Report (DRD C4-13). Within fifteen (15) days of receipt of the Final Flight Report, the Contracting Officer will either determine the launch a Mission Success or inform the Contractor of the Government's intent to withhold determination for payload evaluation.

2.4 Launch Site Support

2.4.1 Pre-Launch Checkout and Launch Support

2.4.1.1 Launch Vehicle Preparation and Launch

For launch services provided under this contract, the Contractor shall, as a minimum;

- (A) Perform all LV preparations and launch site operations necessary to safely and successfully deliver the payload to the desired orbit.
- (B) Generate the required documents and obtain all required safety approvals for the LV System and integrated payload/launch vehicle system operations including payload/LV system integration and launch operations.

- (C) Provide NASA insight as defined in Article 25, to schedule meetings, test briefings, and technical meetings related to vehicle processing and hardware and software anomalies. Upon request, the Contractor shall provide copies of schedules, test briefings, and other material presented at technical meetings.
- (D) Conduct LV/launch site walk-downs with NNC participation.

2.4.1.2 Telemetry Data and Launch Countdown Support

2.4.1.2.1 Baseline Vehicle Support

The Contractor shall provide, in electronic and hard copy form, all raw LV telemetry (RF and hardwire) formats used in sufficient detail to allow NASA to process and verify the data (DRD C6-1). This shall include a detailed listing and description of all measurements and calibration coefficients for all LV telemetry (TM) links including the guidance system.

Upon NASA request, the Contractor shall provide NASA with a test tape representative of the telemetry (RF and hardwire) signals of the launch vehicle and GSE sufficiently prior to the initial power-up test on each mission to allow NASA to verify its ability to process the Contractor's telemetry (SDL S6-1). Upon NASA request, the Contractor shall submit an end-to-end link test plan (SDL S6-2). The Contractor shall ensure proper operation of all LV telemetry links (RF and hardwire), voice communication channels, and video to the NASA ground telemetry station prior to baseline launch vehicle processing. Upon NASA request, the Contractor shall provide an electronic copy and/or a magnetic tape of all significant vehicle test data (SDL S6-3). Upon NASA request, the Contractor shall provide real-time LV telemetry (RF and hardwire) data to NASA's ground telemetry station(s). Examples include, but are not limited to telemetry test data during initial vehicle power application, flight simulation prior to payload mate, and flight simulation following payload mate.

2.4.1.2.2 Integrated Support

Upon NASA request, the Contractor shall provide an electronic copy and/or a magnetic tape of all integrated test data (SDL S6-3). Upon NASA request, the Contractor shall provide real time integrated test telemetry (RF and hardwire) data to NASA's ground telemetry station(s).

2.4.1.2.3 Launch Countdown and Flight Support

The Contractor shall provide launch countdown procedures, Mission Constraints Documents (DRD C1-2) and a Mission Console Notebook (DRD C1-3).

The Contractor shall provide up to eight NASA personnel access to consoles, with vehicle monitoring capabilities, co-located within the launch control center. The Contractor shall provide access to real-time telemetry (RF and hardwire), voice communication channels with talk/listen capabilities, video and telephones for the co-located NASA personnel.

The Contractor shall deliver real-time LV telemetry (RF and hardwire), voice communication channels and video to the NASA ground telemetry station from the start of launch countdown through Range Loss of Signal (LOS) when in range of an existing ground receiving station, or as supplemented as described in SOW paragraph 2.4.3, Range Support and Services. NASA will be responsible for any distribution off base. If the LV telemetry, voice communication channels or video is uniquely encoded, the Contractor shall provide the decoded LV telemetry, voice communication channels, and video.

The Contractor shall receive and record the raw LV telemetry data for all phases of powered flight, from two (2) minutes prior to stage ignition through 60 seconds after payload separation. NASA shall provide any downrange telemetry support required if the Range utilized is unable to support with its existing ground assets. For all mandatory receive and record vehicle TM coverage times, real time transmission back to the NASA TM station shall be provided whenever possible. Post launch and upon request, the Contractor shall provide the raw telemetry data recorded (SDL S6-3).

During the Launch Countdown, the Contractor shall poll NASA at key milestone events for GO/NO-GO status. The final poll shall include the NASA Launch Manager's GO/NO-GO status for launch. The Contractor shall provide NASA access to anomalies and concurrence with anomaly resolution prior to proceeding with Launch Countdown. The Contractor shall poll NASA for any recycle of the Launch Countdown.

2.4.1.3 Launch Dress Rehearsal

The Contractor shall conduct a minimum of one Dress Rehearsal prior to launch. The rehearsal shall exercise the launch countdown procedure, and will have the participation of the NNC and LV Contractor launch teams. The rehearsal may use an abbreviated countdown script with simulated payload/vehicle conditions, including anomalies.

2.4.2 Launch Site Payload Support

2.4.2.1 Payload Processing Facility

For launches conducted from CCAFS, VAFB, and WFF, NASA will provide the Payload Processing Facility (PPF), which meets the requirements of the current Taurus encapsulation process, unless processing services are purchased as a non-standard service. In the event the Contractor proposes and NASA approves an alternate launch site, the Contractor shall be responsible for providing a PPF (except at Reagan Test Site – Kwajalein) subject to NASA approval, meeting the payload requirements.

2.4.2.2 Launch Site Payload Integration Support

The Contractor shall provide all services, equipment, and support required for the integration and launch of each payload as agreed to in the Mission Unique Interface Control Document. Services shall include, as a minimum, the following:

- (A) Encapsulation of the payload complement at the PPF, for either flight or transport to the launch complex, mate with the LV and performance of integrated checkout activities.
- (B) Verification of the end-to-end functionality of the umbilical lines provided for payload use.
- (C) Support for the installation and checkout of the payload GSE (provided by the payload customer) at the launch site as defined in the Mission ICD, and payload communication accommodations from the pad to the PPF as a non-standard service. The Contractor shall also provide for a payload safety console at the launch control center.
- (D) Provision of the mountings for, and the installation of, the payload GSE (provided by the payload customer) at the launch complex and/or remote sites.
- (E) Provision for contingency off-loading of payload propellants as a mission-unique service in accordance with the appropriate Range Safety requirements and appropriate payload procedures.
- (F) Provision for launch site services to meet payload requirements agreed to in the Mission ICD such as: power, air conditioning, GN₂/GHe purges, and contamination control.
- (G) Support of all activities required to de-mate and to return the payload to the processing facility if necessary as a mission-unique service.

- (H) Preparation of the procedures for integrated LV/payload operations for NASA approval and incorporation of the payload procedures as appropriate (DRD C5-5).
- (I) Coordination of payload and LV operations into an integrated operational flow, preparation of the schedules, and provision of the schedules with updates as needed to NNC.
- (J) Provision of contamination control for payloads while they are in the possession of the Contractor, or in a Contractor-provided PPF per the SOW, paragraph 2.4.2.3.
- (K) Reserved
- (L) Certification of payload contamination control requirements for: fairing surface cleanliness, cleanroom environments, and purge system cleanliness.
- (M) Support for the installation of customer-provided RF re-radiating equipment as a mission-unique service.
- (N) Provision for the planning and execution of activities associated with the integrated testing of the customer's payload with the LV on the launch pad.

2.4.2.3 Contamination and Environmental Control

The Contractor shall provide and implement a generic payload contamination control plan and, if required, provide and implement a contamination control implementation plan for each payload. Using MIL-STD-1246C, MIL-PRF-27401D, FED-STD-209E, and NASA RP-1124 (Rev-4) as guidelines, the launch service shall meet the following minimum requirements:

- (A) Payload/Vehicle Integration Environment. For all Contractor provided facilities where the payload resides and is exposed (including payload processing facilities, integration facilities, or facilities at the launch pad), a Class 100,000 clean room environment per FED-STD-209E shall be provided. In addition, the environment shall be maintained within a temperature and humidity range of 19°C to 25°C (66°F to 77°F) and 30% to 65%, respectively. This environment shall be maintained at all times unless the payload is encapsulated within a transportation container or payload fairing and purge air has been established per 2.4.2.3(B) or (C), herein. The Contractor shall provide contamination and environmental monitoring when the payload is exposed.
- (B) Transportation Environment. The following shall apply to all payload transportation containers (including the payload fairing, if used for transportation) provided by the Contractor. Following payload encapsulation,

the transportation container shall be purged with conditioned filtered air or GN₂. The payload environment, as measured at a sensor located inside the fairing volume immediately upstream of the payload cone air exit hole, shall be maintained within a temperature and humidity range of 13 to 23°C (55 to 73°F) and 30% to 50%, respectively. Relative humidity will be controlled to preclude condensation within the fairing. During the transition from the PPF to launch site, one momentary interruption in air conditioning does occur. Conditioned air filtration shall be capable of removing 99.97% of all particles greater than 0.3 microns and removing 95% of all hydrocarbons with a molecular weight greater than 70. GN₂ shall be Grade A, Type 1, (or better) per MIL-PRF-27401D. Transportation GN₂ purging or conditioned air shall not impinge directly on the payload at any point.

- (C) Fairing Environment. Following fairing installation and payload mate to the LV, the PLF environment (as measured at a sensor located inside the fairing volume immediately upstream of the payload cone air exit hole) shall be purged with conditioned filtered air and shall maintain a temperature set point range, selectable by the payload, of 13 to 23°C (55 to 73°F), controllable to +/- 3.3°C (5°F), through T-0. Relative humidity shall be maintained within 30% to 50%. Relative humidity will be controlled to preclude condensation within the fairing. During transition from the PPF to launch site, one momentary interruption in air conditioning does occur. Conditioned air filtration shall be capable of removing 99.97% of all particles greater than 0.3 microns and removing 95% of all hydrocarbons with a molecular weight greater than 70. After the fairing has been closed out for flight, Grade A, Type 1, GN₂ (or better) per MIL-PRF-27401D, may be used for purging the fairing environment. Fairing GN₂ purging or conditioning air shall not impinge directly on the payload at any point.
- (D) Fairing Internal Surface Cleaning. The internal surfaces of the payload fairing shall be cleaned, certified, and maintained to MIL-STD-1246C Level 750A, or better.
- (E) Clean Room Garments. Personnel garments used, at a contractor facility, in the integration of the payload shall be provided and cleaned by the Contractor. Personnel garments used in the integration of the payload shall comply with accepted clean room and personnel safety operating standards as specified in the mission specific contamination control plan.
- (F) Materials. All materials used in areas in close proximity to the payload shall be selected based on NASA RP-1124 (Rev-4). Materials shall have a Total Mass Loss (TML) of less than 1.0% and Collected Volatile Condensable Materials (CVCM) of less than 0.10%, or be expressly identified and submitted to NASA for approval.

2.4.2.4 Operational Support Services

The Contractor shall provide safety training, instruction, and certification for all Contractor-operated or provided integration facilities and launch sites to ensure users are aware of facility, launch site, launch vehicle and payload hazards and have adequate knowledge to carry out their tasks unescorted in a safe manner. The Contractor shall provide access for payload personnel to the payload/LV or storage facilities to accommodate payload customer requirements. The Contractor shall provide security to meet the requirements for payload or personnel protection.

2.4.3 Range Support and Services

Launch vehicles provided under this contract shall include all hardware, software, analysis and support necessary to meet the requirements of EWR 127-1, Eastern/Western Range Safety Requirements.

As part of the launch service, the Contractor shall make all launch Range support arrangements for: scheduling Range for launch and integrated testing, Range Safety functions, communications and timing, metric C-band beacon (radar) coverage, telemetry coverage, camera coverage of launch, and tracking and telemetry station acquisition predictions. If required, NASA will provide down range telemetry aircraft, Tracking and Data Relay Satellite System (TDRSS) and/or NASA owned ground station support for tracking and data recovery. The Contractor shall be responsible for coordinating and ensuring all tracking and data recovery support meets mission requirements (DRDs C2-3 and C2-4).

The Contractor shall make arrangements for Range provided services necessary to support the launch service. As a minimum, the following services are to be provided: fluids, gases, propellants, ordnance storage, facility usage, equipment support, shop and laboratory services, meteorology, base security, fire protection and environmental health. Payload-unique Range services will be provided as a mission-unique service.

The mission specific Program Requirements Document/Operational Requirements (PRD/OR)(DRD C2-2), or equivalent mission specific Range support documentation, shall be submitted to obtain Range support. The Contractor, with support from NASA, shall complete all forms pertinent to the mission and submit them to the appropriate Range for formal acceptance.

2.5 Safety, Reliability, and Quality Assurance

During the period of performance the Contractor shall establish, implement, and maintain comprehensive safety and health, reliability and quality assurance programs covering program management, mission integration management, and the design, development, production, test, integration and launch of the LVS.

2.5.1 Safety and Health Program

The Contractor shall provide a Safety and Health Plan that will implement safety requirements consistent with federal, state, and local government regulations and applicable NASA and Range Safety and Health requirements. This Plan shall describe the Safety organization including structure of management interfaces. Methods employed to ensure compliance with applicable safety requirements shall be identified in accordance with EWR 127-1. When the contractor is performing work in any NASA owned or operated facility (e.g., buildings 836 and 1610 at VAFB, SAEF-2 and PHSF at KSC), all NASA requirements and documentation as contained in the SOW, paragraph 1.3, Compliance Documents, shall be adhered. Each Contractor employee on NASA property, or custodian of NASA assets elsewhere, is responsible for reporting mishaps (DRD C3-2). The Contractor shall make provisions for NASA safety representative insight into integrated Payload/LV processing. For launches at the Eastern Range and Western Range, any agreements between the contractor and the Range for a tailored EWR 127-1 are acceptable to NASA. Likewise, any Range Safety Agreements between the Contractor and WFF are acceptable to NASA.

The Contractor shall implement a system safety program, which identifies and controls system/subsystem hazards that affect personnel, flight hardware and facilities.

2.5.2 Reliability Program

The Contractor shall implement and maintain a Reliability Program with an overall vehicle design reliability of no less than 95% at an 80% confidence factor. The Contractor's program shall facilitate evaluation of the Contractor and subcontractor's programs to determine if the product meets the overall design reliability requirements. Overall vehicle reliability predictions shall be incrementally revised to reflect design modifications.

2.5.3 Quality Assurance Program

The Contractor shall maintain a quality management system that is ISO 9001/2000 third party certified. The Registrar shall be accredited by either the International Registrar of Certified Auditors (IRCA) or the Registrar Accreditation Board (RAB). In the event the Contractor certification is revoked, NASA shall be notified within 5 business days (DRD C3-3).

The Contractor shall maintain a Software Assurance Program using ISO 9001/2000-3 as a guideline.

The Contractor shall accommodate NASA participation in Contractor and subcontractor ISO audits. NASA insight will consist of monitoring audits with the

Contractor's auditors and inspectors in order to provide understanding of the Contractor's quality system and insight of their processes.

The Contractor shall support NASA performance of ISO 2nd party audits, as required. The audits will be performed in accordance with ISO 10011 requirements. The Contractor shall provide a current Audit Plan and schedule for in-house and sub-Contractor audits upon request from NASA (DRD C3-4). The Contractor shall provide a copy of both the Contractor performed internal Quality Audit Report and the subcontractor/vendor Quality Audit Reports (DRD C3-5), when requested by NASA.

The Contractor shall provide for NASA attendance at any flight hardware reviews the Contractor performs at Contractor or subcontractor facilities. The Contractor shall make available to NASA any build paper, test results, nonconformance reports, discrepancy history, statistical process control, and failure analyses that are relevant to the reviews.

The Contractor shall provide NASA remote terminal access (via a secure HTTPS (FTP) website updated daily) to the following existing quality assurance databases: Discrepancy Reports (DRs); Root Cause/Corrective Actions (RCCAs); Limited Life Item lists; As Designed As Built (ADAB) database; active, approved software problem report (SPR) lists; and Orbital-generated alerts (technical and sibling).

The Contractor shall provide NASA all anomaly resolutions that affect the integrated payload/launch vehicle assembly, including both hardware and software. NASA will approve all integrated payload/launch vehicle anomaly resolutions. The contractor shall provide insight to Material Review Board (MRB) and failure reporting for all criticality 1 anomalies.

The Contractor shall participate in the Government/Industry Data Exchange Program (GIDEP) and provide Alert System Documentation (DRD C3-1).

2.6 NASA Insight and Approval

The Contractor shall comply with the Government's implementation of NPD 8610.23 and NPD 8610.24 as defined under Section C, Clause 25.0 and the SOW paragraph 2.2.1, Formal Reviews. As part of the standard launch service, the Contractor shall provide the data, documentation, drawings, analytical models, and support services as necessary to accommodate the requirements specified under contract Section C, Clause 25.0, Government Insight and Approval.

The Contractor shall notify NASA of qualification or test anomalies involving similar launch vehicles, systems, subassemblies and components. The Contractor shall make available to NASA all problem reports or discrepancy

reports on LV systems' failures and anomalies. This shall include insight into fleet-wide problems, anomalies, MRB actions, deviations or waivers to systems, subsystems, materials, processes, and test equipment including those used on non-NASA missions. In the event of an anomaly or launch failure, the Contractor shall support NASA's Failure Review Board, if activated, or shall allow NASA to fully participate in the Contractor's Failure Investigation Board including those for non-NASA missions.

NASA may elect to have representation at a resident office at the Contractor's major manufacturing and engineering facilities for the life of the contract. The Contractor shall provide accommodations and services, such as badging, furniture, telephones, and use of easily accessible fax, viewgraph, and copy machines from one to three residents and up to four visitors. A minimum of two voice and two data phone lines shall be provided. Electronic data transfer compatibility between the resident office and off-site NASA institutions is required. A 'Resident Office' will not be required at CCAFS or VAFB, but NASA will require operational support accommodations (i.e. office space, power, phone, communication boxes for monitoring vehicle testing, etc.) at the launch complex during NASA launch operations.

3.0 NON-STANDARD SERVICES

The Contractor shall provide the non-standard services identified in Exhibit 3 as directed by the Contracting Officer. Implementation of all non-standard services shall be fully compliant with this SOW.

4.0 MISSION UNIQUE REQUIREMENTS

The Contractor shall provide the mission unique services identified in Exhibit 5 as directed by the Contracting Officer. Implementation of all mission unique services shall be fully compliant with this SOW.

4.1 Mission Unique Hardware

The Contractor shall design, manufacture, test, and qualify for flight the mission unique hardware that is required to support the payload and mission. The Contractor shall prepare and submit drawings (DRD C5-4), test plans (DRD C5-2), and test reports (DRD C5-3) to support NASA insight and approval of mission unique hardware.

For vehicle changes initiated by the Contractor that are not fleet-wide changes, the Contractor shall prepare and submit a vehicle data package (DRD C5-1).

The Contractor shall use MIL-STD-1540 B or C as a guideline when developing environmental qualification and acceptance criteria and related test and analysis.

Factors of safety for mission unique hardware shall meet the requirements of Table D1-B.

Application	Test		Analysis (No Test)	
	Yield	Ultimate	Yield	Ultimate
Non-Man Rated	1.10	1.25	1.65	1.90

Table D1-B: Mission Unique Hardware Factors of Safety

4.2 Mission Unique Software

The Contractor shall provide source code and mission constants' listings (DRD C4-11) with appropriate requirement specifications to support NASA approval of mission unique software. The Contractor shall prepare and submit a pre-flight control system and stability analysis report (DRD C4-6) for the vehicle and mission unique software used for each mission.

4.3 Unanticipated Mission Unique Services

At the time of contract award, the Government may not have identified all mission unique services required for each mission. As unanticipated mission unique services are identified, the Contracting Officer will authorize the Contractor, in accordance with FAR 52.243-1, Changes – Fixed Price Alt I, to perform these services. In performing unanticipated mission unique services, the Contractor shall design the necessary ground and flight hardware/software; conduct appropriate design reviews; and manufacture, test and qualify for flight LV mission unique hardware/software, i.e., other than that provided as a standard service (Exhibit 2) or described in the non-standard services list (Exhibit 3).

5.0 SPECIAL TASK ASSIGNMENTS

The Contractor shall be required to perform special studies and analyses, provide materials, or fabricate hardware in support of this contract. Each task will be initiated by written direction from the NASA Contracting Officer. These tasks generally include: advance planning and feasibility studies in support of future contemplated missions; analyses in support of change requirements to authorized missions; development, fabrication, and test of hardware/software to support planning studies or special tests; mission unique studies; material provision; and hardware fabrication in support of potential missions prior to mission authorization.

6.0 INFORMATION TECHNOLOGY SECURITY

The contractor shall comply with NPG 2810.1, NASA's Security on Information Technology Guideline. Existing systems retained by the contractor, shall be brought into compliance within six months of the contract start date. New systems shall be compliant prior to authorization to process. The contractor shall develop, update and implement an IT Security Plan. NASA IT Security personnel will perform the penetration testing requirements of NASA STD NPG 2810.1 section 4.6 per KDP-KSC-P-1334.

7.0 GUIDELINE DOCUMENTS

The following documents are to be used as guidelines to the extent specified in this SOW.

Document No	Rev.	Document Title
AFSPCI 10-1213	7/1/98	Spacelift Launch Strategy and Scheduling Procedures FED-STD 209 Documents cancelled and replaced by two documents below
ISO 14644-1:1999 (E)		Clean rooms and associated controlled environments – Part 1: classification of air cleanliness
ISO 14644-2:2000(E)		Clean rooms and associated controlled environments – Part 2: specifications for testing and monitoring to prove continued compliance with ISO 14644-1
IRIG-106-99		Telemetry Standards
ISO 9001/2000-3		Application of ISO 9001/2000 to Software Development
ISO 10011		Guidelines for Auditing Quality System
JSC SN-C-0005	D	Space Shuttle Contamination Control Requirements
MIL-STD-1553 ¹	B	Digital Time Division Command/Response Multiplex Data Bus
MIL-STD-1540	B or C	Test Requirements for Launch, Upper-Stage, and Space Vehicles
MIL-STD-176	A, Notice 1	Weight and Balance Data Reporting Forms for Guided Missiles and Space Launch Vehicles
MIL-STD-1773	Notice 1	Fiber Optics Mechanization of an Aircraft Internal Time Division Command/Response Multiplex Data Bus
IEST-STD-CC1246	C, 3	Product Cleanliness Levels and Contamination Control Program
MIL-PRF-27401	D	Performance Specification, Propellant Pressurizing Agent, Nitrogen
NASA RP-1124	4	Outgassing Data for Selecting Spacecraft Materials

¹ MIL-STD-1773 may be substituted

8.0 REFERENCE DOCUMENTS

The following documents are hereby incorporated by reference. The Contractor shall comply with the Government's implementation of these policies and instructions.

Document No.	Document Title
NPD 8610.23a	NASA Insight and Approval (Expired version, new NPD in review process)
NPD 8610.24a	Expendable Launch Vehicle (ELV) Launch Services Pre-launch Reviews (Expired version, new NPD in review process)
NPD 8610.7a	Launch Services Risk Mitigation Policy for NASA-Owned or NASA-Sponsored Payloads
PMI K-ELV-10.2	ELV Program Management Instruction for Launch Vehicle Qualification



EXHIBIT 4

SAMPLE CERTIFICATE OF FLIGHT READINESS

The following entities certify that the necessary launch test operations to date have been completed for the launch vehicle and payload. Pending satisfactory closure of in-line work and any open items identified in the Launch Readiness Review, the launch vehicle, payload, and all supporting systems are ready for the launch operation.

Contractor Signature

NASA LSPO Signature

Payload Signature

Pending satisfactory closure of in-line launch vehicle, payload processing, and any open items identified in the Launch Readiness Review, the Range foresees no national resource protection or Range Safety issues, which would preclude launch.

Range Signature

Date: _____

EXHIBIT 5

RESERVED

EXHIBIT 8

RESERVED

ATTACHMENT D2

DATA REQUIREMENTS LIST (DRL)

The Data Requirements List (DRL) identifies critical elements of the contracted effort where NASA requires aspects of mission integration insight and approval. The following DRL defines the scope of documentation required; however, NASA will utilize the Contractor's existing documentation to the extent practicable. Where there is not a direct match between a DRD item and the Contractor's standard documentation, the Contractor's documentation will be acceptable provided it contains equivalent data requirements. DRD approval may be assumed unless the Contractor is notified by NASA of disapproval within thirty (30) days. Under certain circumstances, NASA may elect to eliminate certain submittal cycles.

The number of copies listed in Table D2-A represents the number of hard copies to be delivered to NASA only if the DRD data is not available electronically, except DRDs C1-1, C1-2, C1-3, C5-4, and C5-5 which must also be delivered in hard copy. All data requirements shall be delivered to the KSC ELV Library. The Contractor shall notify the Contracting Officer in writing of DRD delivery.

Item	Document	Approval/ Review	Initial Submittal Date	Subsequent Submittal Date	No. of Copies
C1: Documentation					
C1-1	Formal Review Documentation	Review	(A) At Review; (B,C,D,E) Review + 1W	A/R	A/R
C1-2*	Countdown Documentation	Approval (A,B); Review (C)	L-1W	As Changed	5
C1-3*	Mission Console Notebook	Review	At Launch Dress Rehearsal	As Changed	50
C1-4	Program Master Schedule and Launch Vehicle Planning Manifest	Review	As Released	A/R	10

C2: Mission Integration					
C2-1*	ICD/Verification Matrix	Approval	ATP+ 5M	Released L-15M /As Changed	10
C2-2*	Mission Specific Program Requirements Document/ Operational Requirements (PRD/OR)	Approval	PRD L-10M/ OR L-3M	As Changed	3
C2-3*	LV Detailed Mission Requirements (DMR)	Approval	L-14M (If Required)	L-10M (If Required)	3
C2-4*	Detailed Mission Requirements (DMR) Annex	Approval	L-12M (If Required)	L-6M (If Required)	3
C2-5*	Mission Success Determination Methodology	Approval	NLT L-4M	As Changed	5

*Required per mission

TABLE D2-A: DRL INDEX

Item	Document	Approval/ Review	Initial Submittal Date	Subsequent Submittal Date	No. of Copies
C3: Mission Assurance					
C3-1	Alert System Documentation	Review	Dispo + 1M		2
C3-2	Mishap Reporting and Investigation	Review	Initial Incident Notification = Mishap + 4hrs; Initial Incident Report = Mishap + 24hrs		2
C3-3	ISO 9001/2000 Certification Certificate	Review	RFP Response		1
C3-4	QA Audit Plan and/or Schedule	Review	Contract Award + 45 Days		2
C3-5	QA Audit Report	Review	As Generated	Per Internal or External Audit	2
C3-6	Risk Management Plan	Approval	Contract Award + 90 Days	Annual Review and Updates A/R	1-Elect. 1-Paper

C4: Analysis					
C4-1*	Performance and Guidance Accuracy Analysis (PGAA)	Initial Submittal = Review, Subsequent Submittals = Approval	ATP+ 7M or Receipt of Approved P/L Data + 2M	L-12M; L-6M or Receipt of Approved P/L Data+1M	3
C4-2*	Final Mission Analysis (FMA)	Approval	N/A	L-2M or Receipt of Final P/L Data+1M	3
C4-3*	Payload/Expended Stage Separation Analysis	Approval	L-13M or Released ICD +2M	L-2M	3
C4-4*	Payload Fairing Venting Analysis	Approval	L-12M or Receipt of Approved P/L Data+1M	L-2M or Receipt of Final P/L Data+1M	3
C4-5*	Payload Fairing Clearance Analysis	Approval	L-21M or Receipt of Approved P/L Model +4M	L-15M; L-5M or Receipt of Approved P/L Model +4M	3
C4-6*	Pre-Flight Controls and Stability Analysis	Approval (NASA will provide approval within 14 days of delivery)	L-1M	A/R	3

*Required per mission

TABLE D2-A: DRL INDEX

Item	Document	Approval/ Review	Initial Submittal Date	Subsequent Submittal Date	No. of Copies
C4: Analysis (Continued)					
C4-7*	Coupled Dynamic Loads Analysis	Approval	L-22M or Receipt of Approved P/L Model + 3M	L-16M, L-6M or Receipt of Approved P/L Model + 3M	3
C4-8*	Integrated Thermal Analysis	Approval	L-9M	A/R	3
C4-9*	RF Link Analysis	Approval	L-2M	A/R	3
C4-10*	Payload/Launch Vehicle EMI/EMC and RF Compatibility Analysis	Approval	A/R	A/R	3
C4-11*	Mission Unique Software	Approval	Prelimin. = L-20W;	Final = NLT L-3W	3
C4-12*	Quick Look Flight Report	Review	L+5 Work Days		3
C4-13*	Final Flight Report	Review	L+60 Days	A/R	3

C5: Engineering					
C5-1*	Vehicle Data Package	Review	NLT L-9M (If Required)	As Changed	4
C5-2*	Mission Unique Hardware Test Plan	Approval	NLT L-12M or MUCDR+1M	As Changed	4
C5-3*	Mission Unique Hardware Test Report	Review	Test Completion + 2M	As Changed	4
C5-4*	Mission Unique Drawings	Review	Initial L-18M	Final L-10M	4
C5-5*	Integrated Procedures	Approval	NLT L-2M or 1W Prior to Use	A/R	5

C6: Telemetry and Communications					
C6-1	Vehicle Telemetry Formats	Review	NLT L-4M	As Changed with Vehicle Configuration	2
C6-2*	Vehicle Telemetry (Test, Pre- Launch, and Launch)	Review	Made Available As Generated		1

* Required per mission

TABLE D2-A: DRL INDEX

DATA REQUIREMENT DESCRIPTION

Number: C1-1

FORMAL REVIEW DOCUMENTATION

DESCRIPTION/PURPOSE:

To provide presentation and handout material, minutes, and accompanying action item lists from each formal review.

DATA REQUIREMENTS:

Formal review documentation shall include:

- (A) Presentation packages and hand-out materials provided at the review for NASA attendees
- (B) Minutes from each formal review
- (C) List of attendees
- (D) Agreements from each formal review
- (E) An action item list maintained and updated by the Contractor. The list shall include:
 - (i) Due Date
 - (ii) Subject
 - (iii) Assigned tracking number for each action item
 - (iv) Person or organization responsible for completing the action
 - (v) Status of action (i.e., open, closed, or deleted)

DATA REQUIREMENT DESCRIPTION

Number: C1-2

COUNTDOWN DOCUMENTATION

DESCRIPTION/PURPOSE:

To provide the documents necessary to launch the vehicle and also assist NASA management in determination of a GO or NO-GO.

DATA REQUIREMENTS:

Appendices for the documents listed below shall be provided when necessary to present supplemental or incidental information, detailed tabulations or deviations, or graphic representations.

(A) Countdown

The Countdown document shall provide:

- (i) All necessary steps and built-in holds required to successfully launch the vehicle and its payload during the launch window
- (ii) Procedures required to safe the vehicle after a launch attempt
- (iii) Procedures required to recycle the countdown for another launch attempt

The necessary steps shall be listed as a sequence of events with each entry including a T-time. T-time is defined as the time before launch, not including planned holds, and with T-0 being the time of launch vehicle lift-off from the launch pad. T+ time is any event after T-0 as measured in seconds. Each member of the launch team shall be identified by call sign and communication channel. All mission constraints to launch shall also be identified.

(B) Mission Constraints Document

This document is a summary of all the launch vehicle, payload and range mission constraints to launch. The launch vehicle constraints shall include, but not be limited to:

- (i) Weather
- (ii) Communication

C1-2 (Continued)

- (iii) Range requirements
- (iv) Collision avoidance (COLA)
- (v) Tracking and telemetry

The document shall also identify critical measurements during the launch countdown. Not to exceed values shall be identified for all critical measurements.

(C) Redline Document

A document that identifies all the measurements on the vehicle and each measurement's minimum and maximum values during launch.

DATA REQUIREMENT DESCRIPTION

Number: C1-3

MISSION CONSOLE NOTEBOOK

DESCRIPTION/PURPOSE:

A mission console notebook to assist on-console users during pre-count, terminal count, and plus count operations.

DATA REQUIREMENTS:

As a minimum, the notebook shall include:

- (A) Terminal or abbreviated countdown procedure
- (B) Flight sequence of events
- (C) Range, payload, launch vehicle mandatory items
- (D) Communication channel matrix
- (E) Down-range telemetry coverage plan
- (F) Launch window for all possible attempts
- (G) Launch decision flowchart
- (H) Control center seating
- (I) Call sign matrix
- (J) Protocol for calling holds
- (K) Day of launch winds plan

DATA REQUIREMENT DESCRIPTION

Number: C1-4

PROGRAM MASTER SCHEDULE AND LAUNCH VEHICLE PLANNING MANIFEST

DESCRIPTION/PURPOSE:

The contractor shall develop and provide a Program Master Schedule including sub-tier schedules, production schedules, and launch operations schedules for each launch service. In addition, a Launch Vehicle Planning Manifest shall be provided which forecast launch services for a period of no less than five (5) years.

DATA REQUIREMENTS:

Contractor formats acceptable.

DATA REQUIREMENT DESCRIPTION

Number: C2-1

INTERFACE CONTROL DOCUMENT (ICD)/VERIFICATION MATRIX

DESCRIPTION/PURPOSE:

The ICD identifies and defines the functional and environmental interfaces, and performance requirements of the payload with the launch vehicle and associated payload/launch processing facilities. The ICD shall contain a verification matrix that documents all requirements and methods by which they will be verified and responsible organization.

DATA REQUIREMENTS:

A. Interface Control Document

ICD will include the following representative items at a minimum:

Applicable Documents:

Compliance
Reference

Interface Definition:

Mission and Design
Mechanical
Electrical
Payload Environments
Ground Operations

Interface Verification:

(see below)

B. Verification Matrix

Four methods will be used to verify the ICD – analysis, test demonstration, inspection and/or similarity.

1. Analysis (A). A process used in lieu of or to supplement test data to verify requirement compliance. Analytical techniques include math modeling and simulation, statistical evaluation, systems engineering analysis, and interpretation or interpolation/extrapolation of data under defined conditions. Analysis also includes software design and verification activities.

2. Test (T). Verification by test is performed through use of established principles and procedures for application of electrical, mechanical and/or environmental stimuli in order to measure specific responses using specialized instrumentation. Test may require the

system to be activated and it will be subjected to controlled conditions that represent real or simulated operational parameters.

3. Inspection (I). Inspection is a non-destructive verification method consisting of investigation, without the use of special laboratory appliance or procedure, to determine compliance with requirement. Inspection may be accomplished by:

- a. Reviewing applicable documents, specifications, drawings, or assembly instructions.
- b. Visual examination of hardware to determine qualitative and quantitative properties such as construction features, workmanship, finishes, identification, envelopes, tolerances, and dimensional requirements. Gauging and measurement may be accomplished with simple measuring devices, provided that the system is inactive and those electrical, mechanical and/or environmental stimuli are not applied.

4. Similarity (S). Similarity may be used in lieu of tests, analyses, and inspections when it can be shown that an item is similar or identical in design to another item that has been previously certified to equivalent or more stringent criteria or the requirement has been previously verified and does not need to be re-verified.

DATA REQUIREMENT DESCRIPTION

Number: C2-2

MISSION SPECIFIC PROGRAM REQUIREMENTS DOCUMENT OPERATIONAL REQUIREMENTS (PRD/OR)

DESCRIPTION/PURPOSE:

The Mission Specific Program Requirements Document (PRD) and Operational Requirements (OR) identifies specific support services provided by the Range. Range support services required by NASA and the Contractor are submitted to the Range through the PRD and OR.

DATA REQUIREMENTS:

The Mission Specific PRD/OR, or equivalent mission specific Range support request documentation for the proposed launch site(s), shall be submitted to obtain Range support. The Contractor, with support from NASA/KSC, completes all forms appropriate to the mission in the format required by the Range and submits them to the appropriate Range for formal acceptance.

DATA REQUIREMENT DESCRIPTION

Number: C2-3

LAUNCH VEHICLE DETAILED MISSION REQUIREMENTS (DMR)

DESCRIPTION/PURPOSE:

The Launch Vehicle DMR documents formal requests for tracking, communications, and data system services that are either managed by or negotiated through the Networks and Mission Services Project (Code 450) at Goddard Space Flight Center (GSFC).

DATA REQUIREMENTS:

The DMR, consisting of sets of Universal Documentation System (UDS) standard forms (with associated instructions), shall be completed to obtain network support from NASA for the baseline launch vehicle. The Contractor, with the support of NASA/KSC, completes all forms appropriate to the vehicle and submits them to NASA/KSC for review and GSFC Code 450 for formal acceptance. The DMR shall follow the format provided in the NASA/GSFC Instruction Manual for the NASA DMR document.

DATA REQUIREMENT DESCRIPTION

Number: C2-4

DETAILED MISSION REQUIREMENTS (DMR) ANNEX

DESCRIPTION/PURPOSE:

The DMR Annex documents formal requests for tracking, communications, and data system services that are either managed by or negotiated through the Networks and Mission Services Project (Code 450) at GSFC.

DATA REQUIREMENTS:

The DMR Annex consisting of sets of UDS standard forms (with associated instructions), shall be completed to obtain network support from NASA for the vehicle integration, test, and launch phase of each mission. The Contractor, with support from NASA/KSC completes all appropriate forms and submits them to NASA/KSC for review and GSFC Code 450 for formal acceptance.

DATA REQUIREMENT DESCRIPTION

Number: C2-5

MISSION SUCCESS DETERMINATION METHODOLOGY

DESCRIPTION/PURPOSE:

This data item proposes methodology to support the Contracting Officer's determination of mission success.

DATA REQUIREMENTS:

The Contractor's proposed method, including required vehicle telemetry measurements and ground observation, for verifying that each proposed mission success criterion is satisfied. Allowances for sensor measurement accuracy shall be explicitly identified and justified.

The following notes shall apply to success criteria subject to mission specific requirements:

NOTES:

1. Insertion and Non-insertion altitudes are referenced to WGS-84 Earth equatorial radius.
2. Environmental levels will be determined from the installed instrumentation and telemetry from the launch vehicle.
3. In defining the orbital parameters, "insertion" occurs at the time of spacecraft separation.
4. Loss of launch vehicle telemetry signal or failure of the launch vehicle instrumentation will not be factored into mission success.
5. In the event of inadvertent flight termination by the range, as determined by an anomaly investigation board, no mission success criteria shall apply and full mission success payment shall be made.
6. In the event of a mission peculiar environmental exceedance, no reduction to mission success shall be made if the spacecraft operates successfully to meet the mission objectives.

DATA REQUIREMENT DESCRIPTION

Number: C3-1

ALERT SYSTEM DOCUMENTATION

DESCRIPTION/PURPOSE:

A Government Industries Data Exchange Program (GIDEP) Alert Report will be generated for matches of all hardware covered by this contract.

DATA REQUIREMENTS:

- (A) This report will identify all matches of hardware provided under this contract.
- (B) The report shall identify the GIDEP Alert number, flight hardware impacted, analysis of the problem, and any corrective action required.
- (C) The report shall include results from any subcontractor GIDEP Alert reviews.

DATA REQUIREMENT DESCRIPTION

Number: C3-2

MISHAP REPORTING AND INVESTIGATION

DESCRIPTION/PURPOSE:

All Type A, B, and C mishaps as defined in KHB 1710.2D mishap notification shall be written and immediately provided to the Government Safety Representative Office as outlined in KHB 1710.2 when the contractor is in a NASA-owned or controlled facility or is using NASA assets located elsewhere.

DATA REQUIREMENT:

- (A) Initial Incident Notification: An informal notification of the incident shall be reported to the designated NASA Safety Representative.
- (B) Initial Incident Report: An initial incident report shall be provided to the designated Government Safety Representative. The following information, as a minimum, shall be included: organization, facility, specific location, date and time of incident, date and time the Safety Office was notified, and description of incident.
- (C) Assessment Report: A written assessment shall be prepared; providing supporting justification, if it is determined that the incident is not a mishap. The assessment shall be provided to the designated Government Safety Representative. A mishap report shall be submitted if no assessment is performed.
- (D) Mishap Report: If the incident is a reportable mishap, the Contractor shall submit a written mishap report to the designated Government Safety Representative.
- (E) Corrective Action Plan: A Corrective Action Plan submitted to the designated Government Safety Representative. The submitting organization shall update changes to the completion dates for the submitted corrective actions.

DATA REQUIREMENT DESCRIPTION

Number: C3-3

ISO 9001/2000 CERTIFICATION CERTIFICATE

DESCRIPTION/PURPOSE:

The certificate that is provided by the Registrar upon successful completion of ISO 9001/2000 certification.

DATA REQUIREMENTS:

After completion of ISO 9001/2000 3rd party certification, a copy of the certificate shall be provided to NASA. Upon loss of certification, NASA shall be notified within 5 business days.

DATA REQUIREMENT DESCRIPTION

Number: C3-4

Quality Management System (QMS) and Supplier/Vendor Audit/Assessment Schedules

DESCRIPTION/PURPOSE:

A QMS and Supplier/Vendor schedule that lists all planned audits/assessments and visits to subcontractors, suppliers, vendors, and internal sites.

DATA REQUIREMENTS:

The list shall include the subject of the audit/assessment, a tracking number or identifier, assigned assessor, and a schedule by month indicating the planned event.

DATA REQUIREMENT DESCRIPTION

Number: C3-5

QMS and Supplier/Vendor Audit/Assessment Report

DESCRIPTION/PURPOSE:

Audit/Assessment Report documenting the findings and corrective actions of Audit/Assessments conducted. Reports will be used to monitor Quality Management System and the Supplier Management/Procurement System.

DATA REQUIREMENTS:

The report shall include the date and location of the audit/assessment, participating individuals, purpose of the audit/assessment, assessment duration, method of assessment (i.e., ISO 9001/2000, AS9100, internal policies/procedures), objective, findings corrective action, discussions/comments, and conclusion.

DATA REQUIREMENT DESCRIPTION

Number: C3-6

RISK MANAGEMENT PLAN

DESCRIPTION/PURPOSE:

In accordance with NPD 8610.23A, the contractor shall submit a Contractor's Risk Management Plan to be provided to the COTR for subsequent distribution.

DATA REQUIREMENTS:

- A. This Risk Management Plan shall describe how the contractor proposes to manage and accept risk throughout the program and on all activities required to perform this contract. It shall meet the requirements of the risk analysis section (risk matrix) of the Launch Services Program Risk Management Plan, LSP-PLN-353.01, and shall describe how the contractor will identify, assess, and mitigate/control risks as an integral part of the Contractor's management and decision process.
- Information that illustrates the functional relationships and lines of communication, including the involvement of subcontractors and major vendors.
 - Descriptions of the risk management function within the organization including the process through which management decisions will be made. This will include a description of interfaces with NASA organizations and the NASA decision process for areas such as critical and catastrophic hazards, corrective actions, mishaps, anomaly resolution, safety and technical variances/waivers/exceptions, cost, schedule and mission success.
 - Description of the management controls that will be used to ensure compliance with the risk mitigation process.
- B. Risk reports shall be delivered quarterly (at a minimum) to the COTR. The reports shall include all identified risks, their likelihood, consequence and status of all activities associated with the mitigation, avoidance or acceptance of each risk. The report shall indicate the relative prioritization of all risks.
- C. Access to the contractor's risk database shall be provided to NASA personnel to be identified by the COTR or Contracting Officer.

DATA REQUIREMENT DESCRIPTION

Number: C4-1

PERFORMANCE AND GUIDANCE ACCURACY ANALYSIS (PGAA)

DESCRIPTION/PURPOSE:

This analysis is prepared using the best available mission requirements (payload mass properties, insertion state vector requirements, tracking requirements, etc.) to identify any potential problems inherent in accomplishing the mission objectives. This analysis shall include parametric trade studies as identified below.

DATA REQUIREMENTS:

The preliminary mission analysis shall include, as a minimum:

- (A) The nominal and 3-sigma limits for orbit elements and associated covariance matrix
- (B) Performance impacts as a function of launch date and time.
- (C) Performance capability, margins and reserves
- (D) Sequence of events and tracking coverage
- (E) Time history of trajectory from launch to targeted condition
- (F) Launch vehicle summary weight statement
- (G) Sources and magnitude for all dispersions used. If statistical dispersions are used, then the distribution method (e.g., normal, gaussian) shall be specified for each parameter
- (H) Definition of all coordinate systems used
- (I) Reference to the source(s) for all payload inputs to this analysis (e.g., requirements, mass properties)

DATA REQUIREMENT DESCRIPTION

Number: C4-2

FINAL MISSION ANALYSIS (FMA)

DESCRIPTION/PURPOSE:

This analysis is prepared based on payload requirements resulting from NASA review of the PGAA and contains information similar to that in the PGAA. This analysis supports pre-flight verification of compliance with mission requirements.

DATA REQUIREMENTS:

The FMA shall include, as a minimum:

- (A) The nominal 5 or 6 Degree of Freedom (DOF) trajectory simulation for each targeted insertion condition utilizing actual weights and propulsion models (electronic format is preferred).
- (B) All Data Requirements identified in PGAA Data Requirement Description.

DATA REQUIREMENT DESCRIPTION

Number: C4-3

PAYLOAD/EXPENDED STAGE SEPARATION ANALYSIS

DESCRIPTION/PURPOSE:

The Payload/Expended Stage Separation Analysis is required to demonstrate that adequate separation distance exists between the payload and the upper stage during the relative motion predicted following payload deployment. The analysis is also required to demonstrate that payload tip-off rates satisfy requirements. This analysis supports pre-flight verification of compliance with mission requirements.

DATA REQUIREMENTS:

- (A) Provide nominal, 3-sigma, or worst-case payload tip-off rates and cone angles (cone angles if deployed while spinning) at deployment.
- (B) The analysis shall include the effects of residual thrust, vehicle and payload mass properties uncertainties, and separation mechanism uncertainties. Additionally, include any methods utilized to ensure contamination upon separation is prevented.
- (C) The report documenting this analysis shall list and describe all dispersion sources used for the analysis, mass properties data sources, and all coordinate systems used.
- (D) Expended stage/payload relative motion analysis following payload deployment (may also be included in FMA DRD C4-2).

DATA REQUIREMENT DESCRIPTION

Number: C4-4

PAYLOAD FAIRING VENTING ANALYSIS

DESCRIPTION/PURPOSE:

This analysis shall evaluate and verify that the payload depressurization rate requirements are satisfied.

DATA REQUIREMENTS:

The Payload Fairing Venting Analysis shall be based on the mission trajectory and payload geometry and volume.

DATA REQUIREMENT DESCRIPTION

Number: C4-5

PAYLOAD FAIRING CLEARANCE ANALYSIS

DESCRIPTION/PURPOSE:

This analysis documents/demonstrates that sufficient clearance exists under dynamic conditions is available to prevent payload damage from launch (T-0) through payload fairing jettison.

DATA REQUIREMENTS:

The Payload Fairing Clearance Analysis shall include, as a minimum, the effects of:

- (A) Thermal pre-load
- (B) Disconnect forces
- (C) Actuator forces
- (D) Dynamic response

DATA REQUIREMENT DESCRIPTION

Number: C4-6

PRE-FLIGHT CONTROLS AND STABILITY ANALYSIS

DESCRIPTION/PURPOSE:

This report describes analyses conducted to ensure an acceptable vehicle mission unique autopilot design.

DATA REQUIREMENTS:

- (A) List all flight conditions analyzed. Reference source for flight condition data (e.g., nominal mission trajectory).
- (B) Provide tabular-format gain and filter histories for all times during the course of the mission and provide detailed descriptions of all filters used (by reference, if previously supplied). Mission unique software electronic-format files are acceptable.
- (C) List all vehicle models used including, but not limited to: aerodynamics, mass properties, structural frequencies, thrust profiles, and liquid slosh representations. Reference the source for each vehicle model.
- (D) List all dispersions used and describe (or reference) how they were defined.
- (E) List all software tools used to develop the analyses documented in this report.
- (F) Provide detailed descriptions of all linear analysis results, to include rigid body and flexible mode gain and phase margins at all flight conditions analyzed.
- (G) Provide vehicle structural mode frequency histories in graphical or tabular format (may also be included in CDLA DRD C4-7).
- (H) Describe the results of any and all time-domain controllability analyses either generally applicable to the design or unique to design of the autopilot in the mission unique software.

DATA REQUIREMENT DESCRIPTION

Number: C4-7

COUPLED DYNAMIC LOADS ANALYSIS

DESCRIPTION/PURPOSE:

This analysis defines flight loads to major vehicle and payload structure. This analysis also supports pre-flight verification of compliance with mission requirements.

DATA REQUIREMENTS:

- (A) A description of the model and forcing functions used in the analysis shall be provided. The payload model provided must be in an MSC-NASTRAN compatible format. The model may be provided in Craig-Bampton format or as a Finite Element Model having no more than 30,000 grid points (180,000 degrees of freedom (DOF)).
- (B) The flight events and conditions that cause the greatest loads on the payload shall be identified and included in the analysis. The flight events and conditions that cause the greatest deflections in the fairing and payload (including instances of minimum clearance) shall be identified and included in the analysis.
- (C) Output from each flight event shall include maximum/minimum tables of payload selected Acceleration Transformation Matrices (ATM), interface forces, and internal Load Transformation Matrices (LTM). No more than 1000 rows of output may be requested.
- (D) Worst-case payload fairing dynamic relative deflections shall be identified and included.
- (E) Typically three load cycles will be required per mission: A preliminary loads cycle, intermediate loads cycle, and a verification loads cycle.

DATA REQUIREMENT DESCRIPTION

Number: C4-8

INTEGRATED THERMAL ANALYSIS

DESCRIPTION/PURPOSE:

The purpose of this DRD is to quantify payload thermal environments in various operational configurations (pre-launch and in-flight) using a payload-provided thermal model as one input.

DATA REQUIREMENTS:

The integrated thermal analysis shall include, as a minimum:

- (A) Temperature time histories at selected locations (identified by the payload) in the payload thermal model. The payload model provided must be in SINDA/G format.
- (B) Description of all inputs, assumptions, boundary conditions, and analytical methods used to perform the analysis
- (C) Summary of results identifying maxima and minima (for the selected locations of interest, identified by the payload) and the times and flight events at which they occur

DATA REQUIREMENT DESCRIPTION

Number: C4-9

RF LINK ANALYSIS

DESCRIPTION/PURPOSE:

This analysis is performed for each nominal mission trajectory and is required to ensure sufficient RF Link margins exist for both the telemetry and flight termination systems during all phases of launch through payload separation. This analysis also supports pre-flight verification of compliance with mission requirements.

DATA REQUIREMENTS:

- (A) RF Link analysis using antenna pattern test data for antenna gain, and maximum insertion loss data for cables and dividers/combiners.
- (B) Identify, by reference, the mission trajectory used as an input to this analysis.
- (C) Identify and describe all coordinate systems used.
- (D) Recommend and list ground (and airborne, if applicable) station location assumed and applicable data source references.
- (E) Provide the link data specified below (contractor formats acceptable) for each configuration of Mission, Vehicle System, Launch Date, Ground Station, and Antenna.

LINK DATA

Vehicle Transmitter Power (W):
Ground Antenna Location (HT, LAT, LON):
Vehicle Losses (dB): [TM]
Noise Bandwidth (kHz): [TM]
Ground Station G/T (dB): [TM]
Vehicle Transmitter Frequency (MHz): [TM]
Bit Rate (kBits/Second): [TM]
Ground Station Loss (dB): [CRD]
Ground Antenna Gain (dB): [CRD]
Vehicle Losses, CRD (dB): [CRD]
CRD Threshold (μ V): [CRD]
Frequency (MHz): [CRD]
Uplink Frequency (MHz): [C-band]
Reply Frequency (MHz): [C-band]
Radar EIRP (dBm): [C-band]
Transponder Sensitivity (dBm): [C-band]

DATA REQUIREMENT DESCRIPTION

Number: C4-10

PAYLOAD/LAUNCH VEHICLE EMI/EMC AND RF COMPATIBILITY ANALYSIS

DESCRIPTION/PURPOSE:

This EMI/EMC and RF analysis documents the results of EMI/EMC and RF acceptance tests and demonstrates that design requirements in the ICD are satisfied. This is to ensure payload, LV, and Range are compatible and that payload RF and EMI/EMC energy exposure requirements will not be exceeded.

DATA REQUIREMENTS:

Contractor formats acceptable.

DATA REQUIREMENT DESCRIPTION

Number: C4-11

MISSION UNIQUE SOFTWARE

DESCRIPTION/PURPOSE:

Ensure the mission unique software is consistent with the analyses and data products delivered under DRDs C4-2, C4-3, C4-6, C4-7, and C4-9.

DATA REQUIREMENTS:

- (A) Provide a report describing the methods used to check validity of the mission unique software (by reference if previously supplied).
- (B) Provide a memorandum or report documenting the results of mission unique software validation tests. At a minimum, this report shall include comparison of hardware-in-the-loop flight simulation test results with all required event sequences and the target insertion state.
- (C) Copy, in electronic format (ASCII text), of all mission constants, data loads, for the mission. This data shall match the flight values used in the vehicle flight program.

DATA REQUIREMENT DESCRIPTION

Number: C4-12

QUICK LOOK FLIGHT REPORT

DESCRIPTION/PURPOSE:

After each launch, a quick look post-flight analysis shall be performed using preliminary evaluations of all available vehicle telemetry and insertion performance. A briefing may satisfy the intent of this report.

DATA REQUIREMENTS:

The data report shall include:

- (A) Preliminary trajectory and performance data
- (B) Orbital accuracy estimates
- (C) Preliminary vehicle subsystem system performance
- (D) Preliminary evaluations

DATA REQUIREMENT DESCRIPTION

Number: C4-13

FINAL FLIGHT REPORT

DESCRIPTION/PURPOSE:

After each launch, a final post-flight report shall be provided. This report will support the NASA Contracting Officer's mission success determination.

DATA REQUIREMENTS:

- (A) This report shall include, in its entirety, the Contractor's internal post-flight report produced for each mission.

This report shall also include:

- (i) Orbit elements determined from vehicle guidance data
 - (ii) Vehicle data indicating payload separation
 - (iii) Pre-flight prediction of expected flight environments (i.e., acoustic/vibration, quasi-static acceleration, thermal, and pressure). Generic vehicle environmental data may be submitted unless mission unique environmental requirements are identified in the ICD
 - (iv) Post flight determination of actual flight environments
 - (v) Explanation of significant differences between the predicted and actual flight environments
 - (vi) Vehicle sequence and attitudes data
 - (vii) Payload tracking and telemetry data indicating functional operation of the serial telemetry interface (if any).
- (B) This report shall also specifically address each ICD orbital parameter and environmental condition using flight data, ground observations, or other data sources in accordance with the determination methods proposed by the Contractor under DRD C2-5.

DATA REQUIREMENT DESCRIPTION

Number: C5-1

VEHICLE DATA PACKAGE

DESCRIPTION/PURPOSE:

This item is a data package of vehicle hardware and software changes that are neither dictated by payload requirements nor represent fleet-wide changes.

DATA REQUIREMENTS:

Package shall include, as a minimum:

- (A) A description of the item, the modification, and the purpose of the modification
- (B) For all hardware changes, an indented part list of the item, which shall define the difference between the assigned configuration and the as-built configuration and supporting rationale for differences. For purposes of this requirement, the as-built configuration excludes standard usage hardware (e.g., nuts, bolts, washers, shims, and pins). The as-built configuration list shall contain:
 - (i) Deliverable equipment part name, number, and serial number
 - (ii) Quantity
 - (iii) Drawing number or traceability code
 - (iv) Drawing dash number, change letter and unincorporated Engineering Orders (EOs)
 - (v) For EEE parts: circuit reference designators, part numbers, part manufacturers, and part lot data codes/serial numbers
- (C) For software changes, a copy of all change documentation shall be provided, along with a laboratory and field testing plan
- (D) Test Report/Data/Conclusions - A copy of the test procedures, a description of all changes since item qualification, a description of major fabrication anomalies and their disposition, a copy of the test data, a copy of any test failure reports and their disposition, and final approval signatures. For ordnance, inspection data records and a copy of the lot test data shall also be submitted.

C5-1 (Continued)

- (E) Operating Time/Cycle - Status at the time of delivery of accumulated operating time and/or critical cycles history of parts designated as time/cycle critical
- (F) Allowable (specification requirement) and remaining operating time and/or cycles from point of delivery

DATA REQUIREMENT DESCRIPTION

Number: C5-2

MISSION UNIQUE HARDWARE TEST PLAN

DESCRIPTION/PURPOSE:

This plan describes the qualification, test and analysis effort for mission unique hardware incorporated to meet payload requirements.

DATA REQUIREMENTS:

The mission unique hardware test plan shall include, as a minimum:

- (A) Description, sequence, configuration, factors of safety, and success criteria for all tests and analyses that support qualification of mission unique hardware
- (B) A verification matrix of requirements versus tests/analyses
- (C) Reference to or description of any applicable industry standards used to support testing

DATA REQUIREMENT DESCRIPTION

Number: C5-3

MISSION UNIQUE HARDWARE TEST REPORT

DESCRIPTION/PURPOSE:

This plan describes the qualification and acceptance test results for mission unique hardware.

DATA REQUIREMENTS:

The mission unique hardware test report shall include, as a minimum:

- (A) Sequence, configuration, setup, and results for all tests described in the mission unique hardware test plan (DRD C5-2)
- (B) A compliance matrix of test requirements versus tests successfully completed
- (C) Reference to or description of any applicable industry standards used to support testing
- (D) Detailed description of any test failures, anomalies, open items, and closure plan

DATA REQUIREMENT DESCRIPTION

Number: C5-4

MISSION UNIQUE DRAWINGS

DESCRIPTION/PURPOSE:

This data item identifies the mission unique configuration.

DATA REQUIREMENTS:

- (A) Upper stage and PA mission unique drawings showing all sub-tier mission unique installations, including all payload mechanical interfaces.
- (B) Fairing mission unique drawings showing all sub-tier mission unique installations.
- (C) Top-level vehicle system specification drawings showing all sub-tier mission unique installations.
- (D) All schematics harness drawings, and assembly drawings for mission unique electrical hardware.

DATA REQUIREMENT DESCRIPTION

Number: C5-5

INTEGRATED PROCEDURES

DESCRIPTION/PURPOSE:

Site procedures for various operations that involve the payload and/or the LV/payload interfaces.

DATA REQUIREMENTS:

Provide as a minimum, the following integrated procedures (If applicable):

- (A) Payload/LV electrical interface verification test
- (B) Payload encapsulation and transport
- (C) Payload/LV mate
- (D) LV electrical readiness/flight simulation
- (E) Fairing installation
- (F) Combined system test/final readiness test

DATA REQUIREMENT DESCRIPTION

Number: C6-1

VEHICLE TELEMETRY FORMATS

DESCRIPTION/PURPOSE:

To provide all telemetry (RF and hardware) formats for vehicle system and sub-systems testing, including detailed description of formats that will allow NASA to process, display and verify all launch vehicle telemetry (RF and hardware).

DATA REQUIREMENTS:

The raw vehicle telemetry (RF and hardware) formats shall include as a minimum:

- (A) PCM Data Stream Description: this file will describe the format of the Pulse Code Modulation (PCM) telemetry data stream. A new file must be delivered if the formatting of the PCM data stream is modified. It must include:
 - (i) Bit rate in bits per second
 - (ii) Location and description of sync word
 - (iii) Number of minor frames in major frame
 - (iv) Size of minor frame
 - (v) Number of bits per word or syllable

- (B) Measurement Description File: this file must be standard ASCII text or another format easily read with a personal computer using commercially available software. A new file must be delivered if any measurement or calibration changes are made to the telemetry stream. It must include:
 - (i) Measurement ID
 - (ii) Measurement description
 - (iii) Engineering units of measurement
 - (iv) Location of measurement in minor frame
 - (v) Word step rate of measurement if supercommutated

C6-1 (Continued)

- (vi) Size of measurement in bits or bytes
 - (vii) Type of measurement
 - (viii) Initial minor frame number where measurement is found
 - (ix) Frame step rate of measurement if found in more than 1 minor frame
 - (x) Special conversion algorithm from raw to engineering units if not standard polynomial
 - (xi) Calibration coefficients for conversion from raw to engineering units
 - (xii) Bit number in word if measurement is a discrete
 - (xiii) List of guidance modes that measurement is valid
 - (xiv) Method of determining guidance modes
 - (xv) Measurement mask if required
- (C) Description of rules used to format measurement description file including:
- (i) Description of each field in file
 - (ii) Description of all codes or abbreviations
 - (iii) Method of determining revision level or revision date
- (D) Non-PCM Data Stream Description: This file will describe the format of the data stream location and description of all measurements, and the calibration data required to convert from raw to engineering units
- (E) A list of flight events which will occur for each mission and the nominal time for event occurrence. If event can occur at variable times, this must include a description for determining event time during flight. This list must be delivered for every mission
- (F) A list of predicted position and velocity state vectors for significant events during flight. This list must include, at a minimum, the end of all powered flight phases and payload separation. A description of the coordinate system used to provide the state vectors must also be included. This list must be delivered for every mission

(G) A list of vehicle attitude measurements and description of format used

Note: All files must be delivered using an electronic medium.

DATA REQUIREMENT DESCRIPTION

Number: C6-2

VEHICLE TELEMETRY (TEST, PRELAUNCH, LAUNCH)

DESCRIPTION/PURPOSE:

To provide real time telemetry (RF and Hardwire) to the NASA ground telemetry station which will allow NASA to perform independent data processing and analysis.

DATA REQUIREMENTS:

Provide as a minimum:

- (A) All real time telemetry (RF and hardwire) test data to the NASA ground telemetry station for all system and sub-system testing upon request. This data must be able to be time correlated in a manner that enables time synchronization and must conform to the standards defined in IRIG Standard 106-99.
- (B) All real time telemetry (RF and Hardwire) to the NASA ground telemetry station from the start of Launch Countdown through all phases of powered flight up to Range LOS. This data must be able to be time correlated in a manner that enables time synchronization and must conform to the standards defined in IRIG Standard 106-99.

ATTACHMENT D3
SUPPLEMENTAL DATA LIST (SDL)

The SDL identifies the non-DRD documents generated in the course of production, integration, test, pre-launch, and launch activities that shall be provided to NASA. These items shall be delivered to NASA upon request within ten (10) working days of being made available. Where there is not a direct match between an SDL item and the Contractor's standard documentation, the Contractor's documentation will be acceptable provided it contains equivalent data requirements.

ITEM	DESCRIPTION
S1: Documentation	
S1-1	Launch Service User's Guide
S3: Mission Assurance	
S3-1	Reserved
S3-2	Reserved
S3-3	As-Built Configuration List
S4: Analysis	
S4-1	Mission Battery Budget Analysis
S4-2	EED's Compatibility Analysis
S5: Engineering	
S5-1	Vehicle Test Procedures
S6: Telemetry and Communications	
S6-1	Telemetry Test Tape
S6-2	End to End Link Test Tape
S6-3	Recorded Vehicle Telemetry (Test, Pre-Launch, Launch)

Table D3-A: SDL Index

DATA REQUIREMENT DESCRIPTION

Number: S1-1

LAUNCH SERVICE USER'S GUIDE

DESCRIPTION/PURPOSE:

The Launch Service User's Guide provides customers with information and capabilities regarding launch services.

DATA REQUIREMENTS:

Provide the commercially available Launch Service User's Guide.

DATA REQUIREMENT DESCRIPTION

Number: S3-1

RESERVED

DATA REQUIREMENT DESCRIPTION

Number: S3-2

RESERVED

DATA REQUIREMENT DESCRIPTION

Number: S3-3

AS BUILT CONFIGURATION LIST

DESCRIPTION/PURPOSE:

A document describing the as-built configuration of each LV.

DATA REQUIREMENTS:

The document shall include a listing of all critical serialized components. The listing shall identify the "As-Designed" part number, revision, and description, as well as the "As-Built" part number, revision, serial number, installation work package and any applicable incorporated changes for each item listed.

DATA REQUIREMENT DESCRIPTION

Number: S4-1

MISSION BATTERY BUDGET ANALYSIS

DESCRIPTION/PURPOSE:

This analysis verifies sufficient energy and peak load margin exists to satisfy both vehicle and payload requirements.

DATA REQUIREMENTS:

Contractor formats acceptable.

DATA REQUIREMENT DESCRIPTION

Number: S4-2

EED's COMPATIBILITY ANALYSIS

DESCRIPTION/PURPOSE:

This analysis verifies the payload and LV ordnance will not be unintentionally triggered by the electromagnetic environment around and generated by the integrated payload/LV.

DATA REQUIREMENTS:

Contractor formats acceptable.

DATA REQUIREMENT DESCRIPTION

Number: S5-1

VEHICLE TEST PROCEDURES

DESCRIPTION/PURPOSE:

Procedures for various operations involving LV processing, testing, and checkout.

DATA REQUIREMENTS:

Vehicle processing procedures will be made available for review in support of NASA insight requirements (in accordance with Contract Clause C25-8) at the site where specific vehicle processing occurs.

DATA REQUIREMENT DESCRIPTION

Number: S6-1

TELEMETRY TEST TAPE

DESCRIPTION/PURPOSE:

To provide raw telemetry signals, on magnetic tape or electronic medium, that are representative of the LV's telemetry allowing NASA to process, display and verify LV telemetry prior to LV testing.

DATA REQUIREMENTS:

Provide as a minimum:

- (A) Magnetic test tape and/or electronic copy representative of the telemetry signals of the launch vehicle.
- (B) Data on the magnetic tape and/or electronic copy shall be time correlated in a manner that enables time synchronization of all telemetry data and must conform to IRIG Standard 106-99.

DATA REQUIREMENT DESCRIPTION

Number: S6-2

END TO END LINK TEST PLAN

DESCRIPTION/PURPOSE:

To provide a test plan that verifies the telemetry (RF and hardwire), voice communication channels and video links from the Contractor's site to NASA's ground telemetry station. The plan will test NASA's ability to receive, process, display and verify telemetry, voice communication channels and video from the Contractor's site.

DATA REQUIREMENTS:

The end-to-end link test plan shall address how the Contractor will test all links from the Contractor's site to NASA's ground telemetry station. The plan shall address scope; organizations involved and points of contact for each; facilities used and/or involved; detailed information on telemetry signals, voice communication channels and video sources and transmission rates.

DATA REQUIREMENT DESCRIPTION

Number: S6-3

RECORDED VEHICLE TELEMETRY (TEST, PRE-LAUNCH, LAUNCH)

DESCRIPTION/PURPOSE:

To provide a copy of all telemetry (RF and Hardwire) allowing NASA to perform independent data processing and analysis.

DATA REQUIREMENTS:

To provide magnetic tape or electronic copy of all real time telemetry data provided per DRD C6-2.

ATTACHMENT D4

**SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESS
SUBCONTRACTING PLAN**



DEFENSE CONTRACT MANAGEMENT AGENCY
DEFENSE CONTRACT MANAGEMENT AGENCY WEST
DEFENSE CONTRACT MANAGEMENT AGENCY OPERATIONS
Two Renaissance Square, 40 North Central Ave., Suite 400
Phoenix Arizona 85004

In Reply
Refer To:

DCMAW-GPOC

February 26, 2004

Ms. Linda Pufpaff
Orbital Sciences Corporation/Launch systems Group
3380 South Price Road
Chandler, AZ 85284

Dear Ms. Pufpaff,

On 11 February 2004, the DCMA Phoenix Assistant Director of Small Business conducted a review of your Small Business Utilization Program. Based on this review, a rating of "Acceptable" has been assigned and it has been determined to be in compliance with Public Laws and Federal Acquisition Regulation.

Provided as an enclosure is a copy of Orbital Sciences Corporation Small Business Utilization Program Subcontracting Master Plan.

Sincerely,


GLORIA J. JACOBSON
Administrative Contracting Officer

Enclosure

Cc:
Mr. James Utter, Sr. Vice President
Ms. Catharine H. Szlembariski, Assistant Director of Small Business

ORBITAL SCIENCES CORPORATION
LAUNCH SYSTEMS GROUP (LSG)
3380 SOUTH PRICE ROAD
CHANDLER, AZ 85248

SMALL BUSINESS

VETERAN-OWNED SMALL BUSINESS
(Includes Service Disabled Veteran Owned Small Business)

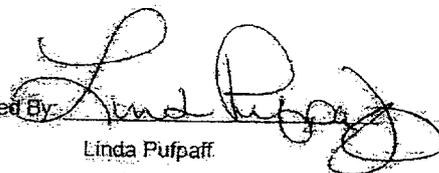
HUBZone SMALL BUSINESS

SMALL DISADVANTAGED BUSINESS

WOMEN-OWNED SMALL BUSINESS

SUBCONTRACTING MASTER PLAN

Submitted By



Linda Pufpaff

Sr. Purchasing Manager

SMALL BUSINESS (SB), VETERAN-OWNED SMALL BUSINESS (VOSB), HUBZone SMALL BUSINESS (HUBZone SB), SMALL DISADVANTAGED BUSINESS (SDB) AND WOMEN-OWNED SMALL BUSINESS (WOSB) SUBCONTRACTING MASTER PLAN

Goals, expressed in terms of percentages of total planned subcontracting dollars, for the use of Small Business, Veteran-Owned Small Business (includes Service Disabled Veteran-Owned) Small Business, HUBZone Small Business, Small Disadvantaged Business, and Women-Owned Small Business concerns as subcontractors shall be attached in the following format to the Master Plan. Dollars include all subcontracts that contribute to contract performance. Indirect costs are not included in establishing goals.

The Subcontract value of direct material have been proposed at an unburdened total of

\$ _____.

Large Business Subcontract Dollars	\$ _____
Large Business Dollars Percentage Goal	_____
Small Business Subcontract Dollars	\$ _____
Small Business Dollars Percentage Goal	_____
Veteran-Owned Small Business Subcontract Dollars	\$ _____
(includes 3% to Service Disabled Veterans)	
Veteran-Owned Small Business Dollars Percentage Goal	_____
(includes 3% to Service Disabled Veterans)	
HUBZone Small Business Dollars	\$ _____
HUBZone Small Business Percentage Goal	_____
Small Disadvantaged Business Subcontracting Dollars	\$ _____
Small Disadvantaged Dollars Percentage Goal	_____
Women-Owned Small Business Subcontract Dollars	\$ _____
Women-Owned Small Business Dollars Percentage Goal	_____

The Small Disadvantaged Business, Veteran-Owned Small Business, HUBZone Small Business, Women-Owned Small Business, HBCU's and M's: dollars are rolled into the Small Business dollars and goals.

Table II attached to the Master Plan shows examples of principal types of supplies and services to be subcontracted to Small Business, Veteran-Owned Small Business, HUBZone Small Business, Small Disadvantaged Business and Women Owned Small Business.

The figures contained in Table I and Table II are based on past history and/or actual quotations obtained in support of an individual proposal.

LSG will continue to try to develop sources and locate additional companies to support government contracts consistent with our guidelines of maintaining a fair market price.

The name of an individual employed by LSG who administers the subcontracting program, and a description of the duties of the individual;

Name: Linda Pufpaff
Address: Orbital Sciences Corporation
Launch Systems Group
3380 South Price Road
Chandler, AZ 85248
Telephone: (480) 814-6017
Title: Sr. Purchasing Manager

This individual's specific duties, as they relate to LSG's subcontracting program include general overall responsibility for this company's Small Business Development (SBD) program, the development, preparation and execution of individual subcontracting plan goals, and monitoring performance relative to contractual subcontracting requirements contained in this plan, including, but not limited to:

- (a) Obtaining SBs, VOSBs, HUBZone SBs, SDBs, and WOSBs including historically Black Colleges and Universities (HBCU's) and Minority Institutions (MI's) sources from all applicable agencies such as Small Business Administration (SBA);
- (b) Assuring inclusion of SBs, VOSBs, HUBZone SBs, SDBs and WOSBs concerns including, HBCU's and MI's in all solicitations where appropriate;
- (c) Attending or arranging for attendance at relevant business opportunity workshops, seminars, trade fairs, etc.;

- (d) Conducting or arranging for conduct motivational training for purchasing personnel pursuant to the intent of Public Law 95-507, and current FAR requirements.
- (e) Monitoring attainment of proposed goals;
- (f) Submission of SF294, Subcontracting Report for Individual contracts, and/or SF295, Summary Subcontract Report.

The following efforts will be taken to ensure that SBs, VOSBs, HUBZone SBs, SDBs, WOSBs, including HBCU's and MI's, have an equitable opportunity to compete for subcontracts:

- (a) Outreach efforts will be made as follows:
 - Contacts with Procurement Marketing and Access Network (PRO-Net)
 - Contacts with minority and small business trade association;
 - Contacts with business development organizations;
 - Attendance at small and minority business procurement conferences and trade fairs;
 - Attendance at DoD South Central Regional Council for Small Business Education and Advocacy meetings.
- (b) Source lists, guides and other data identifying SB, VOSBs, HUBZone SB, SDB and WOSB suppliers will be maintained and utilized by buyers soliciting subcontracts.
- (c) Internal efforts to guide and encourage buyers will include workshops, seminars and training programs and monitoring of activities to evaluate compliance with this subcontracting plan.

LSG shall insert FAR clause 52.219-8, "Utilization of Small Business Concerns" in all subcontracts that offer further subcontracting opportunities, are expected to exceed \$500,000., and are required to include this clause. All large business subcontractors are required to adopt and comply with a subcontracting plan in accordance with FAR clause 52.219-9, "Small Business Subcontracting Plan". Such will be reviewed assuring that all minimum requirements of an acceptable subcontracting plan have been satisfied. The acceptability of percentage goals shall be determined on a case-by-case basis depending on the supplies/services involved, the

availability of potential SB, VOSBs, HUBZone SB, SDB, and WOSB subcontractors, and prior experience. Once approved and implemented, plans will be monitored through the submission of periodic reports, and/or as time and availability of funds permit, periodic visits to subcontractor's facilities to review applicable records and subcontracting program progress.

LSG shall cooperate in any studies or surveys, submit periodic reports as may be required by the contracting agency or the SBA, and submit SF294, Subcontracting Report for Individual Contracts, and SF295, Summary Subcontract Report, following the instructions on the forms or as provided in agency regulation. All SF295 reports submitted at the close of each fiscal year shall include a breakout of subcontract awards, in whole dollars, to small disadvantaged business concerns by Standard Industrial Classification (SIC) Major Group. LSG will monitor its subcontractors to ensure the same.

LSG shall, at a minimum, maintain at least the following types of records to document compliance with this subcontracting plan:

- (a) SB, VOSB, HUBZone SB, SDB, and WOSB source lists, guides, and other data identifying SB, HUBZone SB, SDB, and WOSB suppliers;
- (b) Organizations contacted for SB, HUBZone SB, SDB and WOSB sources;
- (c) Records to support internal activities to guide and encourage buyers, workshops, seminars, training programs, etc., monitoring activities to evaluate compliance;
- (d) On a contract-by-contract basis, records on all subcontract solicitations, over \$100,000 indicating on each solicitation (1) whether SB concerns were solicited, and if not, why not; (2) whether VOSB, HUBZone SB, SDB and WOSB concerns were solicited, and if not, why not; and (3) reasons for the failure of solicited SBs, HUBZone SB, VOSBs, SDBs and WOSBs to receive the subcontract award; and
- (e) Contract by Contract Award Data - Data for contract by contract reporting will be provided by a computer-generated report. The report identifies the purchase agreement number, size status of subcontractor, dollar value of procurement, and supplier identification code.
- (f) A database containing the classification of suppliers.

ORBITAL SCIENCES CORPORATION
LAUNCH SYSTEMS GROUP
3380 SOUTH PRICE ROAD
CHANDLER, AZ 85248

SMALL BUSINESS
VETERAN-OWNED SMALL BUSINESS
(Includes Service Disabled Veteran-Owned Small Business)
HUBZone SMALL BUSINESS
SMALL DISADVANTAGED BUSINESS
WOMEN-OWNED SMALL BUSINESS
SUBCONTRACTING PLAN

Table I

Individual Subcontracting Goals for: NASA LAUNCH SERVICES (NLS)

Contract/Proposal number : RFP 10-99-0021

The Subcontract value of direct material have been purposed at an unburdened total of :
\$ TBP

Category	Goal	Pegasus	Taurus
Large Business Subcontracting Dollars		\$ TBP	\$ TBP
Large Business Dollars Percentage Goal	5 %		
Small Business Subcontracting Dollars		\$ TBP	\$ TBP
Small Business Dollars Percentage Goal	1 %		
Veteran-Owned Small Business Subcontracting Dollars (includes 3% to Service Disabled Veterans)		\$ TBP	\$ TBP
Veteran-Owned Small Business Percentage Goal (includes 3% to Service Disabled Veterans)	.25 %		
HUBZone Small Business Subcontracting Dollars		\$ TBP	\$ TBP
HUBZone Small Business Percentage Goal	.25 %		
Small Disadvantaged Business Subcontracting Dollars		\$ TBP	\$ TBP
Small Disadvantaged Dollars Percentage Goal	.25 %		
Women-Owned Small Business Subcontracting Dollars		\$ TBP	\$ TBP
Women-Owned Small Business Dollars Percentage Goal	.25 %		

The Veteran-Owned Small Business, HUBZone Small Business, Small Disadvantaged Business, HBCU's and MI's dollars are rolled into the Small Business dollars and goals.

See Master Subcontracting Plan for additional plan elements.

ORBITAL SCIENCES CORPORATION
LAUNCH SYSTEMS GROUP
3380 SOUTH PRICE ROAD
CHANDLER, AZ 85248

SMALL BUSINESS
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HUBZone SMALL BUSINESS
SMALL DISADVANTAGED BUSINESS
WOMEN-OWNED SMALL BUSINESS
SUBCONTRACTING PLAN

Table II

Individual Subcontracting Goals for: NASA LAUNCH SERVICES (NLS)

Contract/Proposal number : RFP 10-99-0021

Principal types of supplies and/or services planned to be subcontracted:

Product/Service to be subcontracted	Supplier type/size
Machined Hardware to OSC drawing	Small, HUBZone small business, small disadvantaged, veteran-owned & women-owned small business
Printed Circuit Boards	Small & small disadvantaged
Misc. Hardware	Small, HUBZone small business, small disadvantaged, veteran-owned & women-owned small business
Motors	Large (if not GFE)
Antenna's	Minority Institution
Cable Assemblies	Small, HUBZone small business, small disadvantaged & women-owned small business (if not manufactured in house)
Photo plots	Small disadvantaged
Computers and peripherals	Large, small, small disadvantaged & women-owned

See Master Subcontracting plan for additional plan elements.

Attachment D9
Most Favored Customer Plan

Subject to the provisions of NLS Contract Article B.4.0, the Contractor hereby certifies that the CLIN prices for NLS standard launch services (including standard mission integration) awarded under this contract are no higher than the lowest price charged to any other commercial or U.S. Government customer for an equivalent launch service during the twelve (12) months both preceding and following placement of the Launch Service Task Order (LSTO). The Government shall be entitled to a one-time reduction in contract price for each standard launch service failing to meet this certification. For NLS missions that are under firm contract LSTO the price credit will be equal to the difference between the total firm fixed price standard launch service under this contract including non-standard services and mission unique requirements and the lower price awarded for an equivalent launch service.

This plan only applies to LSTOs that are authorized by orders issued in with contract Section C, Clause 11.0, FAR 52.216-18 and shall not IDIQ prices in Section B, Schedules for future launch services.

or the prices for standard launch vehicle services under this contract (including mission integration, mission unique, and non-standard services) are no higher than the lowest price charged by the Contractor within the preceding or following twelve (12) months, the Government and Contractor shall agree to recognize the differences in NLS vs. new Contract requirements in order to establish equivalency. As such, equivalent pricing will be determined only after considering price discriminating components including but not limited to:

1. Technical and Mission-Unique Requirements
2. Schedule/Period of Performance
3. Performance and Vehicle Type/Configuration
4. Dedicated Mission
5. Hardware Availability or Residual Inventory from previous missions
6. Mission Success Requirements
7. Quantity of Launches and/or Repetitive missions
8. Frequency of Procurements
9. Amount of Government Furnished Equipment, Facilities, and/or Services Provided
10. Commercial Launch Service versus U.S. Government Launch Service
11. Data, Insight, and Approval Requirements
12. Overall Contract Terms and Conditions and Deliverables

ATTACHMENT D10

ACRONYMS AND ABBREVIATIONS

AVR	As Required
AACS	Airborne Air Conditioning System
ABCL	As Built Configuration List
ACS	Attitude Control System
AFSLV	Air Force Small Launch Vehicle
AFSPC	Air Force Space Command
AFSPCI	Air Force Space Command Instruction
AIB	Anomaly Investigation Board
AIT	Assembly and Integration Trailer
Alt.	Alternate
Amps	Amperes
ANSI	American National Standards Institute
AO	Announcement of Opportunity
ASCII	American Standard Code for Information Interchange
ASE	Airborne Support Equipment
ASQC	American Society for Quality Control
ATM	Acceleration Transformation Matrix
ATP	Authority to Proceed
Attn.	Attention
AU	Astronomical Unit
BOM	Bill of Materials
BSI	British Standards Institution
BVS	Best Value Solicitation
C	Centigrade
C ₃	Earth escapes energy expressed in km ² /sec ²
CAGE	Commercial and Government Entity
CBA	Collective Bargaining Agreement
CCAM	Collision/Contamination Avoidance Maneuver
CCAFS	Cape Canaveral Air Force Station
CCB	Configuration Control Board
CCW	Counter-Clockwise
CFR	Code of Federal Regulations

CG	Center of Gravity
CI	Configuration Items
CLA	Coupled Loads Analysis
CLIN	Contract Line Item Number
CLSRB	Current Launch Schedule Review Board
cm	Centimeter
CM	Configuration Management
COLA	Collision Avoidance
COTR	Contracting Officer's Technical Representative
CPAB	Corrective and Prevention Action Board
CSA	Configuration Status Accounting
CSOSA	Commercial Space Operations Support Agreement
CST	Combined System Test
CVCM	Collected Volatile Condensable Material
CW	Clockwise
CY	Calendar Year
D	Day
dB	Decibel
dBm	Decibel Millivolts
DADS	Dynamic Analysis and Design System
DARPA	Defense Advanced Research Projects Agency
DARPASAT	Defense Advanced Research Projects Agency Satellite
DC	Direct Current
DCMAO	Defense Contract Management Area Operations
Deg	Degree
DIG	Designated Industry Group
DLA	Declination of Launch Asymptote
DMR	Detailed Mission Requirements
DoD	Department of Defense
DoDISS	DOD Index of Specifications and Standards
DoDSSP	DOD Single Stock Point
DOF	Degrees of Freedom
DoS	Department of State
DoT	Department of Transportation
DPA	Destructive Physical Analysis
DPAF	Dual Payload Attach Fitting
DPAS	Defense Priority Allocation System

DR	Discrepancy Report
DRD	Data Requirement Description
DRL	Data Requirement List
DRM	Design Reference Mission
DUNS	Data Universal Numbering System
E.O.	Equal Opportunity
EAR	Export Administration Regulations
ECE	Encapsulated Cargo Element
ECR	Engineering Change Request
ECS	Environmental Control System
ECU	Electronic Control Unit
EED	Electro Explosive Device
EEE	Electrical, Electronic and Electromechanical
EFT	Electronic Funds Transfer
EGSE	Electrical Ground Support Equipment
EICD	Electrical Interface Control Document
EIRP	Effective Isotropic Radiated Power
ELV	Expendable Launch Vehicle
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EMISM	Electromagnetic Safety Margin
EO	Engineering Order
ER	Eastern Range
ESD	Electrostatic Discharge
EWP	Engineering Work Package
EWR	Eastern/Western Range
F	Fahrenheit
FAA	Federal Aviation Administration
FAR	Federal Acquisition Regulation
FAS	Fin Actuator System
FC	Flight Computer
FED-STD	Federal Standard
FFP	Firm-Fixed-Price
FMA	Final Mission Analysis
FPMR	Federal Procurement Material Record
FRB	Flight Readiness Board

FRR	Flight Readiness Review
FTS	Flight Termination System
g	Acceleration of Gravity
G&A	General and Administrative
G&C	Guidance and Control
GACS	Ground Airborne Air Conditioning System
GALEX	Galaxy Evolutionary Explorer
GAO	General Accounting Office
GFO	GeoSat Follow-On
GFP	Government-Furnished Property
GHe	Gaseous Helium
GIDEP	Government/ Industries Data Exchange Program
GN&C	Guidance Navigation and Control
GN ₂	Gaseous Nitrogen
Govt.	Government
GOWG	Ground Operations Work Group
GPS	Global Positioning System
GSA	General Services Administration
GSE	Ground Support Equipment
GSFC	Goddard Space Flight Center
GSO	GeoSynchronous Orbit
GTO	Geosynchronous Transfer Orbit
HAPS	Hydrazine Auxiliary Propulsion System
HBK	Handbook
HEPA	High-Efficiency Particulate Air
HESSI	High Energy Spectroscopic Imager
HETE	High Energy Transient Experiment
Horiz	Horizontal
hrs	Hours
HT	Height
Hz	Hertz
ICD	Interface Control Document
ICVM	Individual Cell Voltage Monitor
ID	Identification
IDIQ	Indefinite Delivery/Indefinite Quantity

IFB	Invitation for Bid
IIRR	Independent Internal Readiness Review
IMU	Inertial Measurement Unit
INS	Inertial Navigation System
IPT	Integrated Product Team
IR	Infrared
IRCA	International Registrar of Certified Auditors
IRIG	Inter-Range Instrumentation Group
IRS	Internal Revenue Service
ISA	Initial Support Agreement
ISO	International Organizations for Standardization
ITAR	International Traffic in Arms Regulations
IT	Information Technology
IV&V	Independent Validation and Verification
IVT	Interface Verification Request
JSC	Johnson Space Center
KARI	Korean Aerospace Research Institute
kBit	Kilobit
kg	Kilogram
KHB	Kennedy Handbook
kHz	Kilohertz
km	Kilometer
KOMPSAT	Korean Multi-Purpose Satellite
KSC	Kennedy Space Center
L	Launch
LAT	Latitude
LAT	Lot Acceptance Testing
lbm	Pounds Mass
LC	Launch Conductor
LEO	Low Earth Orbit
LEV	Launch Equipment Van
LHC	Left Hand Circular
LMCM	Launch Management Coordination Meeting
LOCC	Launch Operations Control Center
LON	Longitude

LOS	Loss of Signal
LOWG	Launch Operations Working Group
LPO	Launch Panel Operator
LRR	Launch Readiness Review
LSE	Launch Support Equipment
LSG	Launch Systems Group
LSP	Launch Service Proposal
LSP	Launch Service Provider
LSPO	Launch Service Program Office
LSTO	Launch Service Task Order
LSV	Launch Support Van
LTM	Load Transformation Matrix
LV	Launch Vehicle
LVCC	Launch Vehicle Control Center
LVDC	Launch Vehicle Data Center
m	Meter
M	Month
mA	Milliamps
MAB	Missile Assembly Building
MACH	Modular Avionics Control Hardware
Max	Maximum
MDA	Missile Defense Agency
MDC	Mission Director Center
MDL	Mission Data Load
MFCO	Mission Flight Control Officer
MGS	McMurdo Ground Station
MHz	Megahertz
MIB	Mishap Investigation Board
MIF	Motor Integration Fixture
MIL-PRF	Military Performance Specification
MIL-STD	Military Standard
min	Minute
MIWG	Mission Integration Working Group
MLI	Multi-Layered Insulation
MMAS	Material Management Accounting System
MRB	Material Review Board
ms	Millisecond

MTCR	Missile Technology Control Regime
MTI	Multi-Spectral Thematic Imager
MUCDR	Mission Unique Critical Design Review
MUPDR	Mission Unique Preliminary Design Review
MURR	Mission Unique Requirements Review
MUX	Multiplexer
N/A	Not Applicable
NAFTA	North American Free Trade Agreement
NASA	National Aeronautics and Space Administration
NASA/KSC	National Aeronautics and Space Administration, Kennedy Space Center
NFS	NASA FAR Supplement
NLM	NASA Launch Manager
NLS	NASA Launch Services
NLT	No Later Than
nm	Nanometers
NM	Nautical Mile
NNC	NASA and NASA Customer(s)
No.	Number
NOAA	National Oceanic and Atmospheric Administration
NPD	NASA Policy Directive
NRT	Non-Real Time
NSP	Not Separately Priced
NSPO	National Space Program Office (Taiwan)
NSS	NASA Safety Standard
NSS/GO	NASA Safety Standard/Ground Operations
NTE	Not to Exceed
NVAFB	North Vandenberg Air Force Base
NVR	Non-Volatile Residue
OASPL	Over-All Sound Pressure Level
OCA	Orbital Carrier Aircraft
OCV	Open Circuit Voltage
OD	Operations Directive
OFCCP	Office of Federal Contract Compliance Programs
OMB	Office of Management and Budget
OR	Operational Requirements
Orbital	Orbital Sciences Corporation

OSM	Operations Safety Manager
OTIS	Orbital's Technical Information System
P/FR	Problem/Failure Reporting
PA	Payload Adapter
PAF	Payload Attach Fitting
PC	Personal Computer
PCM	Pulse Code Modulation
PCM/FM	Pulse Code Modulation/Frequency Modulation
PD	Payload Director
PDU	Pyro Drive Unit
PGAA	Performance and Guidance Accuracy Analysis
PHSF	Payload Handling and Storage Facility
PI	Program Introduction
PK	Peacekeeper
PLF	Payload Fairing
PMA	Preliminary Mission Analysis
PMI	Program Management Instruction
POCC	Payload Operation Control Center
POST	Program to Optimize Simulated Trajectories
PPC	Procurement Placement Code
PPF	Payload Processing Facility
ppm	Parts per Million
PRB	Preliminary Review Board
PRD	Program Requirements Document
psf	Pounds per Square Foot
psi	Pounds per Square Inch
PSIL	Pegasus Systems Integration Lab
PSP	Program Support Plan
PSS	Premature Stage Separation
PST	Pacific Standard Time
Pub. L.	Public Law
PWP	Pegasus Work Package
QA	Quality Assurance
Qty.	Quantity
RAAN	Right Ascension of the Ascending Node

RAB	Registrar Accreditation Board
rad.	Radian
RCC	Range Commanders Council
RCS	Reaction Control System
REA	Rocket Engine Assemblies
Ref.	Reference
REM	Reaction Engine Module
RF	Radio Frequency
RFO	Request For Order
RFP	Request For Proposal
RFQ	Request For Quote
RHC	Right Hand Circular
RLA	Right Ascension of Launch Asymptote
ROC	Range Operations Controller
ROCC	Range Operations Control Center
ROWG	Range Operations Working Group
RP	Reference Procedure
rpm	Revolutions Per Minute
RTF	Return to Flight
RTS	Reagan Test Site
RTV	Room Temperature Vulcanizing
S&A	Safe and Arm
S/R	Shipping/Receiving
SAC/HETE	Satelite de Aplicaciones Cientificas/High Energy Transient Experiment
SB	Small Business
SC	Statement of Capability
SCD-1	Brazilian Satellite
SDB	Small Disadvantaged Business
SDL	Supplemental Data List
sec	Second
SELVS	Small Expendable Launch Vehicle Services
SF	Standard Form
SFA	Spaceport Florida Authority
SIGI	Space Integrated INS GPS
SIC	Standard Industrial Classification
SIM	Simulator
SLP	System Level Procedures

SNOE	Student Nitric Oxide Explorer
SORCE	Solar Radiation and Climate Experiment
SOW	Statement of Work
SRM	Solid Rocket Motor
SSA	Source Selection Authority
SSLV	Standard Small Launch Vehicle
ST	Space Technology
STD	Standard
STEP	Space Test Experiment Platform
STEX	Space Technology Experiment
SVAFB	South Vandenberg Air Force Base
SW	Southwest
SWC	Soft Wall Cleanroom
SWG	Safety Working Group
SWP	Special Work Package
Sync	Synchronous
T	Time (as referenced from launch)
TBD	To Be Determined
TBP	To Be Proposed
TD	Technical Document
TDRSS	Tracking and Data Relay Satellite System
TIC	Target Industry Categories
TIN	Taxpayer Identification Number
TM	Telemetry
TM	Technical Manual
TML	Total Mass Loss
TO	Take Off
TOMS-EP	Total Ozone Mapping Spectrometer – Earth Probe
Tot.	Total
TPA	Test Payload Adapter
TPAF	Test Payload Attach Fitting
TPS	Thermal Protection System
TRACE	Transition Region and Coronal Explorer
TSP	Twisted-Shielded Pairs
TSR	Technical Support Room
TT&C	Telemetry, Tracking and Control
TVC	Thrust Vector Controllers

TWP	Taurus Work Package
UDS	Universal Documentation System
UELV	Ultra-Light Expendable Launch Vehicle
UPN	Unique Project Number
U.S.	United States
U.S.C.	United States Code
USAF	United States Air Force
USLS	Upper Stack Lifting Sling
UV	Ultraviolet
V	Volt
VAB	Vehicle Assembly Building
VAFB	Vandenberg Air Force Base
VC-HS	Visibly Clean-Highly Sensitive
VDC	Voltage Direct Current
VDL	Voice-Direct-Links
VETS	Veterans
VIF	Vehicle Integration Facility
VOC	Volatile Organic Compounds
W	Watt
W	Week
WBIS	Wide Band Instrumentation System
WFF	Wallops Flight Facility
WIRE	Wide Field Infrared Explorer
WOB	Woman-Owned Business
WR	Western Range

ATTACHMENT E1

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ATTACHMENT E1

REPRESENTATIONS AND CERTIFICATIONS

1.0 FAR 52.212-3 OFFEROR REPRESENTATIONS AND CERTIFICATIONS-- COMMERCIAL ITEMS (MAR 2005) ALT I (APR 2002)

An offeror shall complete only paragraph (j) of this provision if the offeror has completed the annual representations and certificates electronically at <http://orca.bpn.gov>. If an offeror has not completed the annual representations and certifications electronically at the ORCA website, the offeror shall complete only paragraphs (b) through (i) of this provision.

(a) *Definitions.* As used in this provision:

"Emerging small business" means a small business concern whose size is no greater than 50 percent of the numerical size standard for the NAICS code designated.

"Forced or indentured child labor" means all work or service—

(1) Exacted from any person under the age of 18 under the menace of any penalty for its nonperformance and for which the worker does not offer himself voluntarily; or

(2) Performed by any person under the age of 18 pursuant to a contract the enforcement of which can be accomplished by process or penalties.

"Service-disabled veteran-owned small business concern"—

(1) Means a small business concern—

(i) Not less than 51 percent of which is owned by one or more service-disabled veterans or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more service-disabled veterans; and

(ii) The management and daily business operations of which are controlled by one or more service-disabled veterans or, in the case of a service-disabled veteran with permanent and severe disability, the spouse or permanent caregiver of such veteran.

(2) Service-disabled veteran means a veteran, as defined in 38 U.S.C. 101(2), with a disability that is service-connected, as defined in 38 U.S.C. 101(16).

"Small business concern" means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria in 13 CFR Part 121 and size standards in this solicitation.

"Veteran-owned small business concern" means a small business concern—

(1) Not less than 51 percent of which is owned by one or more veterans (as defined at 38 U.S.C. 101(2)) or, in the case of any publicly owned business, not less than 51 percent of the stock of which is owned by one or more veterans; and

(2) The management and daily business operations of which are controlled by one or more veterans.

"Women-owned business concern" means a concern which is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

"Women-owned small business concern" means a small business concern --

(1) That is at least 51 percent owned by one or more women or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned by one or more women; and

(2) Whose management and daily business operations are controlled by one or more women.

(b) *Taxpayer identification number (TIN)* (26 U.S.C. 6109, 31 U.S.C. 7701). (Not applicable if the offeror is required to provide this information to a central contractor registration database to be eligible for award.)

(1) All offerors must submit the information required in paragraphs (b)(3) through (b)(5) of this provision to comply with debt collection requirements of 31 U.S.C. 7701(c) and 3325(d), reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M, and implementing regulations issued by the Internal Revenue Service (IRS).

(2) The TIN may be used by the government to collect and report on any delinquent amounts arising out of the offeror's relationship with the Government (31 U.S.C. 7701(c)(3)). If the resulting contract is subject to the payment reporting requirements described in FAR 4.904, the TIN provided hereunder may be matched with IRS records to verify the accuracy of the offeror's TIN.]

(3) *Taxpayer Identification Number (TIN)*.

TIN: _____

TIN has been applied for.

TIN is not required because:

Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the United States and does not have an office or place of business or a fiscal paying agent in the United States;

Offeror is an agency or instrumentality of a foreign government;

Offeror is an agency or instrumentality of the Federal Government;

(4) *Type of organization.*

Sole proprietorship;

Partnership;

Corporate entity (not tax-exempt);

Corporate entity (tax-exempt);

Government entity (Federal, State, or local);

Foreign government;

International organization per 26 CFR 1.6049-4;

Other _____

(5) *Common parent.*

Offeror is not owned or controlled by a common parent:

Name and TIN of common parent:

Name _____

TIN _____

(c) Offerors must complete the following representations when the resulting contract is to be performed in the United States or its outlying areas. Check all that apply.

(1) *Small business concern.* The offeror represents as part of its offer that it is, is not a small business concern.

(2) *Veteran-owned small business concern.* [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.] The offeror represents as part of its offer that it is, is not a veteran-owned small business concern.

(3) *Service-disabled veteran-owned small business concern.* [Complete only if the offeror represented itself as a veteran-owned small business concern in paragraph (c)(2) of this provision.] The offeror represents as part of its offer that it is, is not a service-disabled veteran-owned small business concern.

(4) *Small disadvantaged business concern.* [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.] The offeror represents, for general statistical purposes, that it is, is not, a small disadvantaged business concern as defined in 13 CFR 124.1002.

(5) *Women-owned small business concern.* [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.] The offeror represents that it is, is not a women-owned small business concern.

Note: Complete paragraphs (c)(6) and (c)(7) only if this solicitation is expected to exceed the simplified acquisition threshold.

(6) *Women-owned business concern (other than small business concern).* [Complete only if the offeror is a women-owned business concern and did not represent itself as a small business concern in paragraph (c)(1) of this provision.]. The offeror represents that it is, a women-owned business concern.

(7) *Tie bid priority for labor surplus area concerns.* If this is an invitation for bid, small business offerors may identify the labor surplus areas in which costs to be incurred on account of manufacturing or production (by offeror or first-tier subcontractors) amount to more than 50 percent of the contract price:

(8) *Small Business Size for the Small Business Competitiveness Demonstration Program and for the Targeted Industry Categories under the Small Business Competitiveness Demonstration Program.* [Complete only if the offeror has represented itself to be a small business concern under the size standards for this solicitation.]

(i) [Complete only for solicitations indicated in an addendum as being set-aside for emerging small businesses in one of the designated industry groups (DIGs).] The offeror represents as part of its offer that it is, is not an emerging small business.

(ii) [Complete only for solicitations indicated in an addendum as being for one of the targeted industry categories (TICs) or designated industry groups (DIGs).] Offeror represents as follows:

(A) Offeror's number of employees for the past 12 months (check the Employees column if size standard stated in the

solicitation is expressed in terms of number of employees);
or

(B) Offeror's average annual gross revenue for the last 3 fiscal years (check the Average Annual Gross Number of Revenues column if size standard stated in the solicitation is expressed in terms of annual receipts).

(Check one of the following):

<u>Number of Employees</u>	<u>Average Annual Gross Revenues</u>
<input type="checkbox"/> 50 or fewer	<input type="checkbox"/> \$1 million or less
<input type="checkbox"/> 51-100	<input type="checkbox"/> \$1,000,001-\$2 million
<input type="checkbox"/> 101-250	<input type="checkbox"/> \$2,000,001-\$3.5 million
<input type="checkbox"/> 251-500	<input type="checkbox"/> \$3,500,001-\$5 million
<input type="checkbox"/> 501-750	<input type="checkbox"/> \$5,000,001-\$10 million
<input type="checkbox"/> 751-1,000	<input type="checkbox"/> \$10,000,001-\$17 million
<input type="checkbox"/> Over 1,000	<input type="checkbox"/> Over \$17 million

(9) [Complete only if the solicitation contains the clause at FAR 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns, or FAR 52.219-25, Small Disadvantaged Business Participation Program—Disadvantaged Status and Reporting, and the offeror desires a benefit based on its disadvantaged status.]

(i) General. The offeror represents that either—

(A) It is, is not certified by the Small Business Administration as a small disadvantaged business concern and identified, on the date of this representation, as a certified small disadvantaged business concern in the database maintained by the Small Business Administration (PRO-Net), and that no material change in disadvantaged ownership and control has occurred since its certification, and, where the concern is owned by one or more individuals claiming disadvantaged status, the net worth of each individual upon whom the certification is based does not exceed \$750,000 after taking into account the applicable exclusions set forth at 13 CFR 124.104(c)(2); or

(B) It has, has not submitted a completed application to the Small Business Administration or a Private Certifier to be certified as a small disadvantaged business concern in

accordance with 13 CFR 124, Subpart B, and a decision on that application is pending, and that no material change in disadvantaged ownership and control has occurred since its application was submitted.

(ii) *Joint Ventures under the Price Evaluation Adjustment for Small Disadvantaged Business Concerns.* The offeror represents, as part of its offer, that it is a joint venture that complies with the requirements in 13 CFR 124.1002(f) and that the representation in paragraph (c)(9)(i) of this provision is accurate for the small disadvantaged business concern that is participating in the joint venture. [The offeror shall enter the name of the small disadvantaged business concern that is participating in the joint venture: _____.]

(10) *HUBZone small business concern.* [Complete only if the offeror represented itself as a small business concern in paragraph (c)(1) of this provision.] The offeror represents, as part of its offer, that--

(i) It is, is not a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal office, or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR part 126; and

(ii) It is, not a joint venture that complies with the requirements of 13 CFR part 126, and the representation in paragraph (c)(10)(i) of this provision is accurate for the HUBZone small business concern or concerns that are participating in the joint venture. [The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture: _____.] Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

(11) (Complete if the offeror has represented itself as disadvantaged in paragraph (c)(4) or (c)(9) of this provision.) [The offeror shall check the category in which its ownership falls]:

Black American.

Hispanic American.

Native American (American Indians, Eskimos, Aleuts, or Native Hawaiians).

Asian-Pacific American (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China,

Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory or the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru).

Subcontinent Asian (Asian-Indian) American (persons with origins from India, Pakistan, Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal).

Individual/concern, other than one of the preceding.

(d) *Representations required to implement provisions of Executive Order 11246 --*

(1) *Previous contracts and compliance.* The offeror represents that --

(i) It has, has not, participated in a previous contract or subcontract subject to the Equal Opportunity clause of this solicitation; and

(ii) It has, has not, filed all required compliance reports.

(2) *Affirmative Action Compliance.* The offeror represents that --

(i) It has developed and has on file, has not developed and does not have on file, at each establishment, affirmative action programs required by rules and regulations of the Secretary of Labor (41 CFR parts 60-1 and 60-2), or

(ii) It has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

(e) *Certification Regarding Payments to Influence Federal Transactions (31 U.S.C. 1352).* (Applies only if the contract is expected to exceed \$100,000.) By submission of its offer, the offeror certifies to the best of its knowledge and belief that no Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress or an employee of a Member of Congress on his or her behalf in connection with the award of any resultant contract.

(f) *Buy American Act Certificate.* (Applies only if the clause at Federal Acquisition Regulation (FAR) 52.225-1, Buy American Act – Supplies, is included in this solicitation.)

(1) The offeror certifies that each end product, except those listed in paragraph (f)(2) of this provision, is a domestic end product and that the offeror has considered components of unknown origin to have been mined, produced, or manufactured outside the United States. The offeror shall list as foreign end products those end products manufactured in the

United States that do not qualify as domestic end products. The terms "component," "domestic end product," "end product," "foreign end product," and "United States" are defined in the clause of this solicitation entitled "Buy American Act—Supplies."

(2) Foreign End Products:

LINE ITEM NO.	COUNTRY OF ORIGIN
NONE	

Table E1-A: Foreign End Products (Buy American Act)

[List as necessary]

(3) The Government will evaluate offers in accordance with the policies and procedures of FAR Part 25.

(g)

(1) *Buy American Act -- Free Trade Agreements -- Israeli Trade Act Certificate.* (Applies only if the clause at FAR 52.225-3, Buy American Act -- Free Trade Agreements -- Israeli Trade Act, is included in this solicitation.)

(i) The offeror certifies that each end product, except those listed in paragraph (g)(1)(ii) or (g)(1)(iii) of this provision, is a domestic end product and that the offeror has considered components of unknown origin to have been mined, produced, or manufactured outside the United States. The terms "component," "domestic end product," "end product," "foreign end product," and "United States" are defined in the clause of this solicitation entitled "Buy American Act—Free Trade Agreements—Israeli Trade Act."

(ii) The offeror certifies that the following supplies are end products of Australia, Canada, Chile, Mexico, or Singapore or Israeli end products as defined in the clause of this solicitation entitled "Buy American Act—Free Trade Agreements—Israeli Trade Act":

End Products of Australia, Canada, Chile, Mexico, or Singapore, or Israeli End Products:

LINE ITEM NO.	COUNTRY OF ORIGIN
NONE	

Table E1-B: End Products of Australia, Canada, Chile, Mexico, or Singapore, or Israeli End Products (Buy American Act-Free Trade Agreements-Israeli Trade Act) [List as necessary]

(iii) The offeror shall list those supplies that are foreign end products (other than those listed in paragraph (g)(1)(ii) or this provision) as defined in the clause of this solicitation entitled "Buy American Act—Free Trade Agreements—Israeli Trade Act." The offeror shall list as other foreign end products those end products manufactured in the United States that do not qualify as domestic end products.

Other Foreign End Products:

LINE ITEM NO.	COUNTRY OF ORIGIN
NONE	

Table E1-C: Other Foreign End Products (Buy American Act- Free Trade Agreement-Israeli Trade Act) [List as necessary]

(iv) The Government will evaluate offers in accordance with the policies and procedures of FAR Part 25.

(2) *Buy American Act—Free Trade Agreements—Israeli Trade Act Certificate, Alternate I (Jan 2004)*. If Alternate I to the clause at FAR 52.225-3 is included in this solicitation, substitute the following paragraph (g)(1)(ii) for paragraph (g)(1)(ii) of the basic provision:

(g)(1)(ii) The offeror certifies that the following supplies are Canadian end products as defined in the clause of this solicitation entitled "Buy American Act—Free Trade Agreements—Israeli Trade Act":

Canadian End Products:

Line Item No.:

[List as necessary]

(3) *Buy American Act—Free Trade Agreements—Israeli Trade Act Certificate, Alternate II (Jan 2004)*. If Alternate II to the clause at FAR 52.225-3 is included in this solicitation, substitute the following paragraph (g)(1)(ii) for paragraph (g)(1)(ii) of the basic provision:

(g)(1)(ii) The offeror certifies that the following supplies are Canadian end products or Israeli end products as defined in the clause of this solicitation entitled "Buy American Act--Free Trade Agreements--Israeli Trade Act":

Canadian or Israeli End Products:

Line Item No.:	Country of Origin:
NONE	

Table E1-D: Canadian or Israeli End Products (Buy American Act--Free Trade Agreements--Israeli Trade Act)
[List as necessary]

(4) *Trade Agreements Certificate*. (Applies only if the clause at FAR 52.225-5, Trade Agreements, is included in this solicitation.)

(i) The offeror certifies that each end product, except those listed in paragraph (g)(4)(ii) of this provision, is a U.S.-made or designated country end product as defined in the clause of this solicitation entitled "Trade Agreements."

(ii) The offeror shall list as other end products those end products that are not U.S.-made or designated country end products.

Other End Products

Line Item No.:	Country of Origin:
NONE	

Table E1-E: Other End Products (Trade Agreements)
[List as necessary]

(iii) The Government will evaluate offers in accordance with the policies and procedures of FAR Part 25. For line items covered by the WTO GPA, the Government will evaluate offers of U.S.-made or designated country end products without regard to the restrictions of the Buy American Act. The Government will consider for award only offers of U.S.-made or designated country end products unless the Contracting Officer determines that there are no offers for such

products or that the offers for such products are insufficient to fulfill the requirements of the solicitation.

(h) *Certification Regarding Debarment, Suspension or Ineligibility for Award (Executive Order 12549).* (Applies only if the contract value is expected to exceed the simplified acquisition threshold.) The offeror certifies, to the best of its knowledge and belief, that the offeror and/or any of its principals--

(1) Are, are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency; and

(2) Have, have not, within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a Federal, state or local government contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and

(3) Are, are not presently indicted for, or otherwise criminally or civilly charged by a Government entity with, commission of any of these offenses.

(i) *Certification Regarding Knowledge of Child Labor for Listed End Products (Executive Order 13126).* [The Contracting Officer must list in paragraph (i)(1) any end products being acquired under this solicitation that are included in the List of Products Requiring Contractor Certification as to Forced or Indentured Child Labor, unless excluded at 22.1503(b).]

(1) Listed End Product

Listed End Product	Listed Countries of Origin:
NONE	

(2) *Certification.* [If the Contracting Officer has identified end products and countries of origin in paragraph (i)(1) of this provision, then the offeror must certify to either (i)(2)(i) or (i)(2)(ii) by checking the appropriate block.]

(i) The offeror will not supply any end product listed in paragraph (i)(1) of this provision that was mined, produced, or manufactured in the corresponding country as listed for that product.

(ii) The offeror may supply an end product listed in paragraph (i)(1) of this provision that was mined, produced, or manufactured in the corresponding country as listed for that product. The offeror

certifies that it has made a good faith effort to determine whether forced or indentured child labor was used to mine, produce, or manufacture any such end product furnished under this contract. On the basis of those efforts, the offeror certifies that it is not aware of any such use of child labor.

(i)

(1) *Annual Representations and Certifications.* Any changes provided by the offeror in paragraph (j) of this provision do not automatically change the representations and certifications posted on the Online Representations and Certifications Application (ORCA) website.

(2) The offeror has completed the annual representations and certification electronically via the ORCA website at <http://orca.bpn.gov>. After reviewing the ORCA database information, the offeror verifies by submission of this offer that the representation and certifications currently posted electronically at FAR 52.212-3, Offeror Representations and certifications—Commercial Items, have been entered or updated in the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201), except for paragraphs NONE. [Offeror to identify the applicable paragraphs at (b) through (i) of this provision that the offeror has completed for the purposes of this solicitation only, if any. These amended representation(s) and/or certification(s) are also incorporated into his offer and are current, accurate, and complete as of the date of this offer. Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on ORCA.]

2.0 MINIMUM CONTRACT REQUIREMENT CERTIFICATIONS

2.1 Provide certification demonstrating successful launch and delivery of a payload to orbit using a launch service capable of placing a 250 kg payload into a 200 km circular orbit at an inclination of 28.5°.

Mission Name: See Past Performance Volume 3

Vehicle Configuration: Pegasus, Taurus, Taurus XL

Launch Date: See Past Performance Volume 3

Payload Customer: NASA-KSC, U.S. Air Force, NSPO
Republic of China

2.2 Certification Regarding United States Commercial Provider of Space Transportation Services (Public Law 105-303, Title II, Section 201)

- (A) Participation in this procurement is restricted to prime contractors from the United States launch vehicle/services industry meeting the definition of United States commercial provider.
- (B) The Offeror certifies, to the best of its knowledge and belief, that it is is not a United States commercial provider as defined below--
- (i) 'United States commercial provider' means a commercial provider, organized under the laws of the United States or of a State, which is--
- (a) more than 50 percent owned by United States nationals; or
- (b) a subsidiary of a foreign company and the Secretary of Transportation finds that--
- (1) such subsidiary has in the past evidenced a substantial commitment to the United States market through--
- (I) investments in the United States in long-term research, development, and manufacturing (including the manufacture of major components and subassemblies); and
- (II) significant contributions to employment in the United States; and
- (2) the country or countries in which such foreign company is incorporated or organized, and, if appropriate, in which it principally conducts its business, affords reciprocal treatment to companies described in subparagraph (B)(i)(a) comparable to that afforded to such foreign company's subsidiary in the United States, as evidenced by--
- (I) providing comparable opportunities for companies described in subparagraph (B)(i)(a) to participate in Government sponsored research and development similar to that authorized under this Act;
- (II) providing no barriers, to companies described in subparagraph (B)(i)(a) with respect to local investment opportunities, that are not provided to foreign companies in the United States; and
- (III) providing adequate and effective protection for the intellectual property rights of companies described in subparagraph (B)(i)(a).
- (C) "Launch services" means all services required in the performance of this contract, excluding those necessary to produce or manufacture launch vehicle(s), its components and other equipment and facilities required in the performance of the contract. "Controlling interest" means ownership of an

amount of equity in such entity sufficient to direct management or to void transactions entered into by management. Ownership of at least fifty-one (51) percent of the equity creates a rebuttable presumption that such interest is controlling.

- (D) The Contractor shall provide in the performance of this contract launch vehicles that are domestic end products. The launch vehicle shall be a domestic end product only if the cost of its components, mined, produced or manufactured in the United States exceeds 50 percent of the cost of all its components. The cost of each component includes transportation costs to the place of incorporation into the launch vehicle and any applicable duty (whether or not a duty-free entry certificate is issued.) "Components," as used in this clause, means those articles, materials and supplies directly incorporated into the end product.
- (E) The Contractor shall provide, in the performance of this contract, domestic launch services. Launch services shall be considered to be domestic if the cost for launch services performed by United States industry sources exceeds 50 percent of the cost of the total required launch services.
- (F) The Offeror certifies that the proposal is, is not in compliance with paragraphs (A), (B), (C), (D), and (E) above. Any proposal failing to demonstrate its compliance with these criteria will not be considered for award.

2.3 The business entity(ies) actually performing the work specified in this contract shall be ISO 9001/2000 certified by a registrar accredited by either the International Registrar of Certified Auditors (IRCA) or the Registrar Accreditation Board (RAB). The Offeror shall comply with this requirement by demonstrating that the corporation(s), corporate division(s), subsidiary(ies), joint venturer(s), partner(s), and/or any other business entity actually performing launch vehicle manufacture, payload/LV integration, testing, and launch activities is/are ISO 9001/2000 certified. A copy of the ISO Certification Certificate shall be provided to NASA.

Corporation Name: Orbital Sciences Corporation

ISO 9001/2000 Certificate Number: FM 40001

Copy of ISO Certificate Attached: Yes

3.0 FAR 52.204-5 WOMEN-OWNED BUSINESS (OTHER THAN SMALL BUSINESS) (MAY 1999)

(a) *Definition.* "Women-owned business concern," as used in this provision, means a concern that is at least 51 percent owned by one or more women; or in the case of any publicly owned business, at least 51 percent of its stock is owned by one or more women; and whose management and daily business operations are controlled by one or more women.

(b) *Representation.* [Complete only if the offeror is a women-owned business concern and has not represented itself as a small business concern in paragraph (b)(1) of FAR 52.219-1, Small Business Program representations, of this solicitation.] The offeror represents that it is is not a women-owned business concern.

4.0 FAR 52.222-24 PREAWARD ON-SITE EQUAL OPPORTUNITY COMPLIANCE EVALUATION (FEB 1999)

If a contract in the amount of \$10 million or more will result from this solicitation, the prospective Contractor and its known first-tier subcontractors with anticipated subcontracts of \$10 million or more shall be subject to a pre-award compliance evaluation by the Office of Federal Contract Compliance Programs (OFCCP), unless, within the preceding 24 months, OFCCP has conducted an evaluation and found the prospective Contractor and subcontractors to be in compliance with Executive Order 11246.

5.0 COMPLIANCE WITH VETERANS' EMPLOYMENT REPORTING REQUIREMENTS (FEB 1999)

By submission of its offer, the Offeror represents that, if it is subject to the reporting requirements of 37 U.S.C. 4212(d) (i.e., the VETS-100 report required by Federal Acquisition Regulation clause 52.222-37, Employment Reports on Disabled Veterans and Veterans of the Vietnam Era), it has submitted the most recent report required by 37 U.S.C. 4212(d).

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT 1. CONTRACT ID CODE PAGE 1 of 2

2. AMENDMENT/MODIFICATION NO. 1 3. EFFECTIVE DATE See Block 16C 4. REQUISITION/PURCHASE NO. PR 4200145571 5. PROJECT NO. (If applicable) NLS-O

6. ISSUED BY John F. Kennedy Space Center, NASA Procurement Office/Operations Support Office Attn: OP-LS/Jacqueline Brooks Kennedy Space Center, Florida 32899 CODE OP-LS 7. ADMINISTERED BY (If other than Item 6) Same as Block 6 CODE

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and Zip Code) Orbital Sciences Corporation, Inc. 21839 Atlantic Boulevard Dulles, Virginia 20166 9A. AMENDMENT OF SOLICITATION NO. 9B. DATED (SEE ITEM 11) 10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B 10B. DATED (SEE ITEM 13) September 15, 2005

CODE FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

(a) By completing Items 8 and 15, and returning ___ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. **FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.** If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required) PR 4200145571 \$250,000

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

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

E. IMPORTANT: Contractor is not, is required to sign this document and return 4 copies to the issuing office.

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

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) Raymond E. Palladino Sr. Director, Contracts - LSG 16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Jacqueline Brooks Contracting Officer

15B. CONTRACTOR/OFFEROR 15C. DATE SIGNED 4/5/06 16B. UNITED STATES OF AMERICA 16C. DATE SIGNED APR 06 2006 BY (Signature of person authorized to sign) BY (Signature of Contracting Officer)

Contractor's Copy

(Item 14 Continued)

- A. The purpose of this modification is to add funding in accordance with Section C, Clause 6.0, NFS 1852.232-77 Limitation of Funds (Fixed-Price Contract) in the amount of \$250,000. The allotment date is May 31, 2006.
- B. Also, this modification hereby definitizes, adjusts and incorporates into the contract Non-Launch Services Task Order NLSO-001 and its revisions. Accordingly, the contract value is increased by \$250,000.
- C. As a result of the above, CLIN 10 is increased by \$250,000 from \$0 to \$250,000. Section B, Clause 2.1, Total Contract Amount, is therefore increased by \$250,000 from \$100,000 to \$350,000.
- D. For ease of contract administration, Section B, Clause 2.1 – Total Contract Amount and Section B, Clause 7.0 – Special Task Assignments (Studies and Analyses) (CLIN 10) – Definitized are hereby added.
- E. All other terms and conditions of the Task Order remain unchanged.

The following replacement pages are provided: B-i, B-2, B-12, B-16 and C-12.

The parties hereto agree that this supplemental agreement represents a complete and equitable adjustment for the definitization of Task Order NLSO-001 listed in this contract modification, including all revisions, authorized under CLIN 10 of this contract. The Contractor hereby releases the Government from any and all liability under this contract for further equitable adjustments attributable to such facts or circumstances giving rise to Task Order NLSO-001 listed in this contract modification, that were agreed to as written.

(End of Modification 1)

SECTION B

STANDARD FORM 1449 CONTINUATION

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1.5 Special Task Assignments (Studies and Analyses)

CLIN	Description of Supplies and Service	Qty*	Unit	Unit Price (\$)	Total Amount (\$)
10	Special Task Assignments - Firm Fixed-Price Composite Labor Hours	A/R	Labor Hour	See Tables B-6/7	See Tables B-6/7
	See Section B, Clause 7.0 for definitized task assignments				

* Not to exceed 500,000 Cumulative Hours for Calendar Years 2004 through 2010

Table B-5: Special Task Assignments (Studies and Analyses)

HOURLY LABOR RATE (COMPOSITE SKILL MIX AND BURDENED)	FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED			
	2004	2005	2006	2007

Table B-6: Hourly Labor Rate - FFP List

The Contractor shall submit a price proposal update to convert NTE CY 2008 – 2010 labor rates into FFP labor rates at least 180 days prior to the end of CY 2007. The proposed labor rates shall be negotiated using the applicable procedures of FAR Part 15 and incorporated herein.

HOURLY LABOR RATE (COMPOSITE SKILL MIX AND BURDENED)	NOT TO EXCEED (NTE) PRICE (\$) IN CALENDAR YEAR ORDERED		
	2008	2009	2010

Table B-7: Hourly Labor Rate - NTE Price List

1.6 IDIQ Launch Service Task Order (LSTO)

The Government reserves the unilateral right to order launch services at any time from contract award through the second quarter of CY 2010 in accordance with contract Section C, Clause 14.0, Launch Service Task Ordering Procedures. These launch services are identified in Tables B-9 and B-10 and described in Exhibits 2 and 3 to the Statement of Work. NTE prices for launch services for IDIQ missions will be part of the price evaluation and best value selection for award of an IDIQ task order contract.

2.0 TOTAL AWARD AMOUNT

The total contract price at contract award is \$100,000.

2.1 Total Contract Amount

The total firm fixed-price of the contract for all definitized work under the contract is \$350,000. This amount includes CLIN 10 Total Amounts in Section B Clause 7.

3.0 LAUNCH SERVICE FLEXIBILITY

3.1 General

The Government reserves the unilateral right, at any time, to substitute payloads, as well as to substitute standard launch services and/or add/delete non-standard services thereto, for any mission awarded to the contractor under this contract. Substitution of those standard launch services identified in Table B-11, or addition/deletion of those non-standard services identified in Table B-12 shall be accomplished in accordance with contract clauses 3.1 and 3.2, respectively. Cost impacts resulting from payload substitution, substitution of standard launch services not listed in Table B-11 and/or additions/deletions of non-standard services not listed in Table B-12 shall be subject to the changes clause. Once payment begins on a qualified standard launch service and NASA insight commences, the Government also reserves the right to approve any Contractor initiated substitution of the launch vehicle or reallocation of launch vehicle hardware designated for a NASA mission under this contract.

3.2 Standard Launch Service Substitutions

Prior to ATP, the Government has the unilateral right to substitute the standard launch services identified in Table B-11, at the prices stated therein, for the standard launch services identified for the IDIQ missions awarded to the Contractor (Table B-8). Any such substitution accomplished prior to ATP shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for substitutions made after ATP shall be subject to the changes clause.

LAUNCH VEHICLE CONFIGURATION	FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED			
	2004	2005	2006	2007
	N/A	N/A	N/A	N/A

Table B-11: FFP List for Standard Launch Services

7.0 Special Task Assignments (Studies and Analyses) (CLIN 10) - Definitized

Task Assignment No.	Description	Hours	Firm Fixed-Price

Table C-1: Launch Service Payment Schedule

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

**6.0 NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)**

- (a) The sum of \$250,000 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(l) "Termination for the Government's convenience" notwithstanding.
- (c)
 - (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until May 31, 2006.
 - (2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT 1. CONTRACT ID CODE PAGE 1 of 2

2. AMENDMENT/MODIFICATION NO. 2 3. EFFECTIVE DATE See Block 16C 4. REQUISITION/PURCHASE NO. PR 4200163795 5. PROJECT NO. (If applicable) NLS-O

6. ISSUED BY CODE OP-LS 7. ADMINISTERED BY (If other than Item 6) CODE Same as Block 6
 John F. Kennedy Space Center, NASA
 Procurement Office/Operations Support Office
 Attn: OP-LS/Steve Craig
 Kennedy Space Center, Florida 32899

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and Zip Code)
 Orbital Sciences Corporation, Inc.
 21839 Atlantic Boulevard
 Dulles, Virginia 20166

9A. AMENDMENT OF SOLICITATION NO.
 9B. DATED (SEE ITEM 11)
 10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B
 10B. DATED (SEE ITEM 13) September 15, 2005

CODE FACILITY CODE
 11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

12. ACCOUNTING AND APPROPRIATION DATA (If required)
 PR 4200163795

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

- A THIS CHANGE ORDER IS ISSUED PURSUANT TO (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
- B THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (Such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
- C THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
- D OTHER (Specify type of modification and authority) Section B, Clause 1.4, Non-Standard Services Ordered Independently of a Defined Mission CLIN 9

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

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

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

15a. NAME AND TITLE OF SIGNER (Type or print)		16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Jacqueline Brooks Contracting Officer	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED JUN 29 2008
BY _____ (Signature of person authorized to sign)		BY <u>Jacqueline Brooks</u> (Signature of Contracting Officer)	

Table C-1: Launch Service Payment Schedule

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

**6.0 NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)**

- (a) The sum of \$462,451 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(l) "Termination for the Government's convenience" notwithstanding.
- (c) (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until September 6, 2006.
- (2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at

(Item 14 Continued)

The purpose of this modification is to order Non-Standard Service
i, pursuant to Section B, Clause 1.4, Non-
Standard Services Ordered Independently of a Defined Mission, CLIN 9 and (pursuant to
Section C, Clause 11.0, FAR 52.216-18 Ordering (OCT 1995).

- A. Section B, Clause 2.1 Total Contract Amount is increased by
- B. For ease of contract administration, Section B, Clause 8.0- Non-Standard Services
Ordered Independently of a Defined Mission is hereby added.
- D. Section C, Clause 6.0, NFS 1852.232-77 Limitation of Funds (Fixed Price Contract) is to
correct the Limitation funds amount from \$250,000 to \$350,000.
The allotment date of May 31, 2006 is extended to September 6, 2006.
- E. Except as provided herein, all other terms and conditions of Contract NNK05LB04B,
remains unchanged and in full force and effect.

The following replacement pages are provided: B-12, B-17 and C-12.

(End of Modification 2)

2.0 TOTAL AWARD AMOUNT

The total contract price at contract award is \$100,000.

2.1 Total Contract Amount

The total firm fixed-price of the contract for all definitized work under the contract is \$462,451. This amount includes CLINs 9 and 10, Total Amounts in Section B Clause 7.0 and 8.0.

3.0 LAUNCH SERVICE FLEXIBILITY

3.1 General

The Government reserves the unilateral right, at any time, to substitute payloads, as well as to substitute standard launch services and/or add/delete non-standard services thereto, for any mission awarded to the contractor under this contract. Substitution of those standard launch services identified in Table B-11, or addition/deletion of those non-standard services identified in Table B-12 shall be accomplished in accordance with contract clauses 3.1 and 3.2, respectively. Cost impacts resulting from payload substitution, substitution of standard launch services not listed in Table B-11 and/or additions/deletions of non-standard services not listed in Table B-12 shall be subject to the changes clause. Once payment begins on a qualified standard launch service and NASA insight commences, the Government also reserves the right to approve any Contractor initiated substitution of the launch vehicle or reallocation of launch vehicle hardware designated for a NASA mission under this contract.

3.2 Standard Launch Service Substitutions

Prior to ATP, the Government has the unilateral right to substitute the standard launch services identified in Table B-11, at the prices stated therein, for the standard launch services identified for the IDIQ missions awarded to the Contractor (Table B-8). Any such substitution accomplished prior to ATP shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for substitutions made after ATP shall be subject to the changes clause.

LAUNCH VEHICLE CONFIGURATION	FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED			
	2004	2005	2006	2007
	N/A	N/A	N/A	N/A

Table B-11: FFP List for Standard Launch Services

8.0 Non-Standard Services Ordered Independently of a Defined Mission (CLIN 9)-
Definitized

CLIN	Description	Qty	Unit	Unit Price (\$)	Total Amount (\$)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT 1. CONTRACT ID CODE PAGE
1 of 2

2. AMENDMENT/MODIFICATION NO. 3. EFFECTIVE DATE 4. REQUISITION/PURCHASE NO. 5. PROJECT NO. (If applicable)
3 See Block 16C PR 4200175650 NLS-O

6. ISSUED BY CODE OP-LS 7. ADMINISTERED BY (If other than Item 6) CODE
John F. Kennedy Space Center, NASA
Procurement Office/Operations Support Office
Attn: OP-LS/Steve Craig
Kennedy Space Center, Florida 32899
Same as Block 6

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and Zip Code) 9A. AMENDMENT OF SOLICITATION NO.
Orbital Sciences Corporation, Inc.
21839 Atlantic Boulevard
Dulles, Virginia 20166
9B. DATED (SEE ITEM 11)
9C. DATED (SEE ITEM 11)
10A. MODIFICATION OF CONTRACT/ORDER NO.
NNK05LB04B
10B. DATED (SEE ITEM 13)
September 15, 2005

CODE FACILITY CODE
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

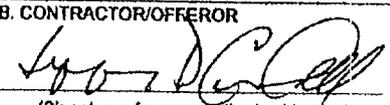
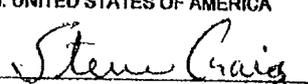
12. ACCOUNTING AND APPROPRIATION DATA (If required)
PR 4200175650 Increase

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.
 A THIS CHANGE ORDER IS ISSUED PURSUANT TO (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
 B THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (Such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
 C THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
 D OTHER (Specify type of modification and authority)
Section B, Clause 1.4, Non-Standard Services Ordered Independently of a Defined Mission CLIN 9

E. IMPORTANT: Contractor is not, is required to sign this document and return 4 copies to the issuing office.

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

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) JEFFREY D. CAMPBELL DIRECTOR, CONTRACTS	16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Steve Craig Contracting Officer
15B. CONTRACTOR/OFFEROR BY  (Signature of person authorized to sign)	15C. DATE SIGNED 9/19/06
16B. UNITED STATES OF AMERICA BY  (Signature of Contracting Officer)	16C. DATE SIGNED 9/19/06

(Item 14 Continued)

The purpose of this modification is to order
pursuant to Section B, Clause 1.4, Non-Standard Services Ordered
Independently of a Defined Mission, CLIN 9 and (pursuant to Section C, Clause 11.0, FAR
52.216-18 Ordering (OCT 1995).

- A. Section B, Clause 2.1 Total Contract Amount is increased by
- B. As a result of the above Section B, Clause 8.0 adds 9.2.1 and
CLIN 9.2.2 are recognized as payment event No. 1 and 2 and includes the payment event,
payment amount, criteria as well as estimated completion period, respectively. Therefore,
the total of Clause 8.0 CLIN 9 is increased by
- C. Section C, Clause 6.0, NFS 1852.232-77 Limitation of Funds (Fixed Price Contract), the
total value is revised to increase the sum available for payment by
§ The allotment date of September 6, 2006 is extended to March 16,
2007.
- D. Except as provided herein, all other terms and conditions of Contract NNK05LB04B,
remains unchanged and in full force and effect.

The following replacement pages are provided: B-12, B-17 and C-12.

(End of Modification 3)

2.0 TOTAL AWARD AMOUNT

The total contract price at contract award is \$100,000.

2.1 Total Contract Amount

The total firm fixed-price of the contract for all definitized work under the contract is \$749,768. This amount includes CLINs 9 and 10, Total Amounts in Section B Clause 7.0 and 8.0.

3.0 LAUNCH SERVICE FLEXIBILITY

3.1 General

The Government reserves the unilateral right, at any time, to substitute payloads, as well as to substitute standard launch services and/or add/delete non-standard services thereto, for any mission awarded to the contractor under this contract. Substitution of those standard launch services identified in Table B-11, or addition/deletion of those non-standard services identified in Table B-12 shall be accomplished in accordance with contract clauses 3.1 and 3.2, respectively. Cost impacts resulting from payload substitution, substitution of standard launch services not listed in Table B-11 and/or additions/deletions of non-standard services not listed in Table B-12 shall be subject to the changes clause. Once payment begins on a qualified standard launch service and NASA insight commences, the Government also reserves the right to approve any Contractor initiated substitution of the launch vehicle or reallocation of launch vehicle hardware designated for a NASA mission under this contract.

3.2 Standard Launch Service Substitutions

Prior to ATP, the Government has the unilateral right to substitute the standard launch services identified in Table B-11, at the prices stated therein, for the standard launch services identified for the IDIQ missions awarded to the Contractor (Table B-8). Any such substitution accomplished prior to ATP shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for substitutions made after ATP shall be subject to the changes clause.

LAUNCH VEHICLE CONFIGURATION	FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED			
	2004	2005	2006	2007
	N/A	N/A	N/A	N/A

Table B-11: FFP List for Standard Launch Services

Table C-1: Launch Service Payment Schedule

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

**6.0 NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)**

- (a) The sum of \$749,768 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(l) "Termination for the Government's convenience" notwithstanding.
- (c) (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until March 16, 2007.
- (2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT 1. CONTRACT ID CODE PAGE 1 of 2

2. AMENDMENT/MODIFICATION NO. 4 3. EFFECTIVE DATE See Block 16C 4. REQUISITION/PURCHASE NO. PR 4200189388 5. PROJECT NO. (If applicable) NLS-O

6. ISSUED BY John F. Kennedy Space Center, NASA Procurement Office/Operations Support Office Attn: OP-LS/Steve Craig Kennedy Space Center, Florida 32899 CODE OP-LS 7. ADMINISTERED BY (If other than Item 6) Same as Block 6 CODE

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and Zip Code) Orbital Sciences Corporation, Inc. 21839 Atlantic Boulevard Dulles, Virginia 20166 9A. AMENDMENT OF SOLICITATION NO. 9B. DATED (SEE ITEM 11) 10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B 10B. DATED (SEE ITEM 13) September 15, 2005

CODE FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

(a) By completing Items 8 and 15, and returning ___ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. **FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.** If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required) PR 4200189388

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

- A THIS CHANGE ORDER IS ISSUED PURSUANT TO (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
- B THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (Such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
- C THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
- D OTHER (Specify type of modification and authority) Section B, Clause 1.4, Non-Standard Services Ordered Independently of a Defined Mission CLIN 9

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

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

See Continuation Page(s)
Non-Standard Service (NSS) Pre-ATP Coupled Loads Analysis

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

15a. NAME AND TITLE OF SIGNER (Type or print)		16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Steve Craig Contracting Officer	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED FEB 14 2007
BY _____ (Signature of person authorized to sign)		BY <u>Steve Craig</u> (Signature of Contracting Officer)	

(Item 14 Continued)

The purpose of this modification is to order
Standard Services Ordered Independently of a Defined Mission, pursuant to Section B, Clause 1.4, Non-
Standard Services Ordered Independently of a Defined Mission, CLIN 9 and (pursuant to
Section C, Clause 11.0, FAR 52.216-18 Ordering (OCT 1995).

A. Section B, Clause 2.1 Total Contract Amount is increased by

B. As a result of the above Section B, Clause 8.0 adds CLIN

Therefore, the total of Clause 8.0 CLIN 9 is increased by :

C. Section C, Clause 6.0, NFS 1852.232-77 Limitation of Funds (Fixed Price Contract) total
value is revised to increase the sum available for payment by

The previous allotment date (March 16, 2007 shown in mod 3) is corrected to
reflect what should have been the accurate date of May 16, 2007. The corrected
allotment date of May 16, 2007 is extended to July 25, 2007.

D. Except as provided herein, all other terms and conditions of Contract NNK05LB04B,
remains unchanged and in full force and effect.

The following replacement pages are provided: B-12, B-17 and C-12.

(End of Modification 4)

2.0 TOTAL AWARD AMOUNT

The total contract price at contract award is \$100,000.

2.1 Total Contract Amount

The total firm fixed-price of the contract for all definitized work under the contract is \$868,966. This amount includes CLINs 9 and 10, Total Amounts in Section B Clause 7.0 and 8.0.

3.0 LAUNCH SERVICE FLEXIBILITY

3.1 General

The Government reserves the unilateral right, at any time, to substitute payloads, as well as to substitute standard launch services and/or add/delete non-standard services thereto, for any mission awarded to the contractor under this contract. Substitution of those standard launch services identified in Table B-11, or addition/deletion of those non-standard services identified in Table B-12 shall be accomplished in accordance with contract clauses 3.1 and 3.2, respectively. Cost impacts resulting from payload substitution, substitution of standard launch services not listed in Table B-11 and/or additions/deletions of non-standard services not listed in Table B-12 shall be subject to the changes clause. Once payment begins on a qualified standard launch service and NASA insight commences, the Government also reserves the right to approve any Contractor initiated substitution of the launch vehicle or reallocation of launch vehicle hardware designated for a NASA mission under this contract.

3.2 Standard Launch Service Substitutions

Prior to ATP, the Government has the unilateral right to substitute the standard launch services identified in Table B-11, at the prices stated therein, for the standard launch services identified for the IDIQ missions awarded to the Contractor (Table B-8). Any such substitution accomplished prior to ATP shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for substitutions made after ATP shall be subject to the changes clause.

LAUNCH VEHICLE CONFIGURATION	FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED			
	2004	2005	2006	2007
	N/A	N/A	N/A	N/A

Table B-11: FFP List for Standard Launch Services

Table C-1: Launch Service Payment Schedule

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

**6.0 NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)**

- (a) The sum of \$868,966 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(l) "Termination for the Government's convenience" notwithstanding.
- (c) (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until July 25, 2007.
- (2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT 1. CONTRACT ID CODE PAGE 1 of 1

2. AMENDMENT/MODIFICATION NO. 5 3. EFFECTIVE DATE See Block 16C 4. REQUISITION/PURCHASE NO. PR 4200145571 5. PROJECT NO. (If applicable) NLS-O

6. ISSUED BY CODE OP-LS 7. ADMINISTERED BY (If other than Item 6) CODE Same as Block 6
 John F. Kennedy Space Center, NASA
 Procurement Office/Operations Support Office
 Attn: OP-LS/Marielyn Achille-Argaez
 Kennedy Space Center, Florida 32899

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and Zip Code)
 Orbital Sciences Corporation, Inc.
 21839 Atlantic Boulevard
 Dulles, Virginia 20166

9A. AMENDMENT OF SOLICITATION NO.
 9B. DATED (SEE ITEM 11)
 10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B
 10B. DATED (SEE ITEM 13) September 15, 2005

CODE FACILITY CODE 11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

(a) By completing Items 8 and 15, and returning ___ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
 PR 4200145571 (\$15,069)

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

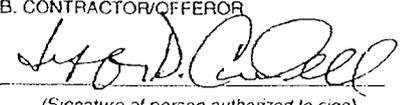
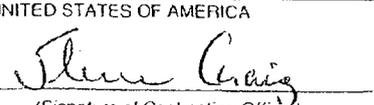
- A THIS CHANGE ORDER IS ISSUED PURSUANT TO (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
- B THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (Such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
- C THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Limitation of Funds, NFS 1852.232-77
- D OTHER (Specify type of modification and authority)

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

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

The purpose of this modification is to deobligate excess, expiring funds from Task Assignment NI SQ-001 Funding was provided in the amount of \$250,000 on Modification 1.
 Therefore, the excess funding and the contract value are both reduced from the difference bringing the new contract value and total current obligations to

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) Jeffrey D. Campbell Director, Contracts		16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Steve Craig Contracting Officer	
15b. CONTRACTOR/OFFEROR BY  (Signature of person authorized to sign)	15c. DATE SIGNED 9/28/07	16b. UNITED STATES OF AMERICA BY  (Signature of Contracting Officer)	16c. DATE SIGNED 9/28/07

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE	PAGE OF PAGES 1 1
2. AMENDMENT/MODIFICATION NO. 06	3. EFFECTIVE DATE See Block 16C	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable) NLS-O
6. ISSUED BY NASA/John F. Kennedy Space Center Office of Procurement MAIL CODE OP-LS ATTN: Marialyn Achille-Argaez KENNEDY SPACE CENTER FL 32899	CODE KSC	7. ADMINISTERED BY (If other than Item 6) NASA/Kennedy Space Center Office of Procurement MAIL CODE OP-LS ATTN: Marialyn Achille-Argaez KENNEDY SPACE CENTER FL 32899	CODE KSC
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code) ORBITAL SCIENCES CORP Attn: Jeffrey D. Campbell 21839 ATLANTIC BLVD DULLES VA 20166-6850		(x) 9A. AMENDMENT OF SOLICITATION NO.	
CODE		FACILITY CODE	9B. DATED (SEE ITEM 11)
		X 10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B	
		10B. DATED (SEE ITEM 11) 09/15/2005	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

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

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

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

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

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)
 The purpose of this modification is to provide contract change pages for modification 5. These pages include B-12, B-17, and C-12.

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

15A. NAME AND TITLE OF SIGNER (Type or print)	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Steve Craig
15B. CONTRACTOR/OFFEROR	16B. UNITED STATES OF AMERICA <i>Steve Craig</i> (Signature of Contracting Officer)
15C. DATE SIGNED	16C. DATE SIGNED 11/21/2007

2.0 TOTAL AWARD AMOUNT

The total contract price at contract award is \$100,000.

2.1 Total Contract Amount

The total firm fixed-price of the contract for all definitized work under the contract is \$853,897. This amount includes CLINs 9 and 10, Total Amounts in Section B Clause 7.0 and 8.0.

3.0 LAUNCH SERVICE FLEXIBILITY

3.1 General

The Government reserves the unilateral right, at any time, to substitute payloads, as well as to substitute standard launch services and/or add/delete non-standard services thereto, for any mission awarded to the contractor under this contract. Substitution of those standard launch services identified in Table B-11, or addition/deletion of those non-standard services identified in Table B-12 shall be accomplished in accordance with contract clauses 3.1 and 3.2, respectively. Cost impacts resulting from payload substitution, substitution of standard launch services not listed in Table B-11 and/or additions/deletions of non-standard services not listed in Table B-12 shall be subject to the changes clause. Once payment begins on a qualified standard launch service and NASA insight commences, the Government also reserves the right to approve any Contractor initiated substitution of the launch vehicle or reallocation of launch vehicle hardware designated for a NASA mission under this contract.

3.2 Standard Launch Service Substitutions

Prior to ATP, the Government has the unilateral right to substitute the standard launch services identified in Table B-11, at the prices stated therein, for the standard launch services identified for the IDIQ missions awarded to the Contractor (Table B-8). Any such substitution accomplished prior to ATP shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for substitutions made after ATP shall be subject to the changes clause.

LAUNCH VEHICLE CONFIGURATION	FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED				
	2004	2005	2006	2007	
	N/A	N/A	N/A	N/A	

Table B-11: FFP List for Standard Launch Services

7.0 Special Task Assignments (Studies and Analyses) (CLIN 10) - Definitized

Task Assignment No.	Description	Hours	Firm Fixed-Price

Table C-1: Launch Service Payment Schedule

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

**6.0 NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)**

- (a) The sum of \$353,897 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(l) "Termination for the Government's convenience" notwithstanding.
- (c) (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until July 25, 2007.
- (2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at

14. DESCRIPTION OF AMENDMENT/MODIFICATION (con't)

1. The purpose of this modification is to provide notice of a change in the Billing/Paying Office for Contract Number NNK05LB04B.

Effective April 1, 2008, the NASA payment function, currently performed by the John F. Kennedy Financial Management Office, will transition to the NASA Shared Services Center (NSSC). Payments for the contract listed above, will now be processed at our new NSSC location provided below. **Please continue to submit your vouchers to the Contracting Officer. This modification is just to inform you of our payment office change.**

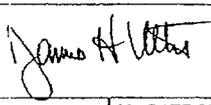
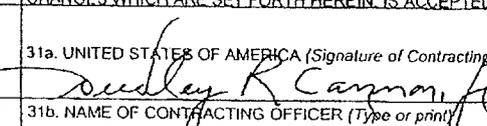
Designated Paying Office

NASA Shared Services Center (NSSC)
Financial Management Division (FMD) – Accounts Payable
Bldg 1111, C. Road
Stennis Space Center, MS 39529
Email: NSSC-AccountsPayable@nasa.gov
Fax: 866-209-5415

2. Block 18a of Standard Form 1449 is amended to include the designated paying office information as presented above.
3. All other terms and conditions of this contract remain unchanged.

Replacement page Standard Form 1449 is provided.

(End of Modification - Mod No. 7)

SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS OFFEROR TO COMPLETE BLOCKS 12, 17, 23, 24 & 30				1. REQUISITION NUMBER 4200130653		PAGE 1 OF 1	
2. CONTRACT NO. NNK05LB04B		3. AWARD/EFFECTIVE DATE 9/15/05		4. ORDER NUMBER		5. SOLICITATION NUMBER RFP10-99-0021 Rev A	
6. SOLICITATION ISSUE DATE October 18, 1999		7. OFFER DUE DATE/LOCAL TIME 17 August 2005		8. OFFER DUE DATE/LOCAL TIME			
FOR SOLICITATION INFORMATION CALL:		a. NAME Edwin Martinez		b. TELEPHONE NUMBER (No collect calls) (321) 867-1699			
ISSUED BY NASA John F. Kennedy Space Center Procurement Office, Mail Code: OP-LS Attn: Edwin Martinez Kennedy Space Center, Florida 32899		CODE OP-LS		10. THIS ACQUISITION IS <input checked="" type="checkbox"/> UNRESTRICTED SET ASIDE: % FOR SMALL BUSINESS SMALL DISADVANTAGED BUSINESS 8(A) SIC: 3761 SIZE STANDARD: 1000		11. DELIVERY FOR FOB DESTINATION UNLESS BLOCK IS MARKED <input type="checkbox"/> SEE SCHEDULE	
14. METHOD OF SOLICITATION <input type="checkbox"/> RFD <input type="checkbox"/> RFQ <input type="checkbox"/> IFB <input checked="" type="checkbox"/> RFP						12. OFFER ACCEPTANCE PERIOD 30 Days from Date in Block 8	
						13A. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 700)	
						13B. RATING DO-C9	
15. DELIVER TO Same as Block 9.		CODE OP-LS		16. ADMINISTERED BY Same as Block 9.		CODE	
17a. CONTRACTOR/OFFEROR Orbital Sciences Corporation 21839 Atlantic Boulevard (Bldg 1) Dulles, Virginia 20166 TELEPHONE NO. 703-406-5423		PPC/STATE CODE () ()		FACILITY CODE 10-191-6062		18a. PAYMENT WILL BE MADE BY CODE NASA Shared Services Center (NSSC) Financial Management Division (FMD) -- Accounts Payable/Bldg 1111, C. Road Stennis Space Center, MS 39529	
17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER				18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a. UNLESS BLOCK BELOW IS CHECKED SEE ADDENDUM			
19. ITEM NO.		20. SCHEDULE OF SUPPLIES/SERVICES		21. QUANTITY		22. UNIT	
						23. UNIT PRICE	
						24. AMOUNT	
NASA LAUNCH SERVICES IN ACCORDANCE WITH SECTION B, C AND D.				ORIGINAL			
(Attach Additional Sheets as Necessary)							
25. ACCOUNTING AND APPROPRIATION DATA				26. TOTAL AWARD AMOUNT (For Govt. Use Only)			
<input checked="" type="checkbox"/> 27a. SOLICITATION INCORPORATES IN FULL TEXT FAR 52.212-1, 52.212-4, FAR 52.212-3 & 52.212-5 ARE ATTACHED. ADDENDA <input checked="" type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED.							
<input checked="" type="checkbox"/> 27b. CONTRACT/PURCHASE ORDER INCORPORATES IN FULL TEXT FAR 52.212-4. FAR 52.212-5 IS ATTACHED. ADDENDA <input checked="" type="checkbox"/> ARE <input type="checkbox"/> ARE NOT ATTACHED.							
<input checked="" type="checkbox"/> 28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN 3 COPIES TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED HEREIN.				<input type="checkbox"/> 29. AWARD OF CONTRACT: REFERENCE OFFER DATED THE OFFER ON SOLICITATION (BLOCK 5), INCLUDING ANY ADDITIONS OR CHANGES WHICH ARE SET FORTH HEREIN, IS ACCEPTED AS TO ITEMS:			
30a. SIGNATURE OF OFFEROR/CONTRACTOR 				31a. UNITED STATES OF AMERICA (Signature of Contracting Officer) 			
30b. NAME AND TITLE OF SIGNER (Type or print) James H. Utter Deputy General Manager, Business Operations		30c. DATE SIGNED 15 Aug 05		31b. NAME OF CONTRACTING OFFICER (Type or print) Dudley R. Cannon, Jr.		31c. DATE SIGNED 9-15-05	
32a. QUANTITY IN COLUMN 21 HAS BEEN <input type="checkbox"/> RECEIVED <input type="checkbox"/> INSPECTED <input type="checkbox"/> ACCEPTED, AND CONFORMS TO THE CONTRACT, EXCEPT AS NOTED				33. SHIP NUMBER <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL		34. VOUCHER NUMBER	
32b. SIGNATURE OF AUTHORIZED GOVT. REPRESENTATIVE				32c. DATE		35. AMOUNT VERIFIED CORRECT FOR	
36. PAYMENT <input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL				37. CHECK NUMBER			
38. S/R ACCOUNT NO.		39. S/R VOUCHER NO.		40. PAID BY			
CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT				42a. RECEIVED BY (Print)			
41. SIGNATURE AND TITLE OF CERTIFYING OFFICER		41c. DATE		42b. RECEIVED AT (Location)			
				42c. DATE REC'D (YY/MM/DD)		42d. TOT. CONTAINERS	

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE 1 of 2
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2. AMENDMENT/MODIFICATION NO. 8	3. EFFECTIVE DATE See Block 16C	4. REQUISITION/PURCHASE NO.	5. PROJECT NO. (If applicable) NLS-O
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6. ISSUED BY John F. Kennedy Space Center, NASA Procurement Office/Operations Support Office Attn: OP-LS/Marialyn Achille-Argaez Kennedy Space Center, Florida 32899	CODE OP-LS	7. ADMINISTERED BY (If other than Item 6) Same as Block 6	CODE
--	---------------	--	------

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and Zip Code) Orbital Sciences Corporation, Inc. 21839 Atlantic Boulevard Dulles, Virginia 20166 (703) 408-5423	<input type="checkbox"/>	9A. AMENDMENT OF SOLICITATION NO.
	<input type="checkbox"/>	9B. DATED (SEE ITEM 11)
	<input checked="" type="checkbox"/>	10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B
	<input type="checkbox"/>	10B. DATED (SEE ITEM 13) September 15, 2005

CODE 9X711	FACILITY CODE
------------	---------------

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

(a) By completing Items 6 and 15, and returning ___ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. **FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.** If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

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 data, etc.)	SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
<input checked="" type="checkbox"/>	C	THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:	Clause 1.6, IDIQ Launch Service Task Order (LSTO)
<input type="checkbox"/>	D	OTHER (Specify type of modification and authority)	

E. IMPORTANT: Contractor is not, is required to sign this document and return 4 copies to the issuing office.

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

Add CLIN 1, NuSTAR Mission to the NLS 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) James H. Utter Sr. VP & Dep General Manager	15b. CONTRACTOR/OFFEROR BY <u>James H. Utter</u> (Signature of person authorized to sign)	15c. DATE SIGNED 3-9-09	16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Steve Craig Contracting Officer	16b. UNITED STATES OF AMERICA BY <u>Steve Craig</u> (Signature of Contracting Officer)	16c. DATE SIGNED 3/12/09
---	---	----------------------------	--	--	-----------------------------

14. DESCRIPTION OF AMENDMENT/MODIFICATION (continued)

- a. The purpose of this contract modification is to award a firm fixed-price (FFP) launch service in support of the NuSTAR Mission pursuant to Contract Clause 14.0 entitled Launch Service Task Ordering (LSTO) Procedures. This FFP includes the Standard and Non-Standard Launch Services, as well as Standard Mission Integration, pertinent to the NuSTAR Mission.

The following change pages are included.

Section B pages B-i, B-1, and B-1.1 through B-1.2

Section C pages C-ii, C-11.1, and C-25

Section D, page D-1; Attachment D1, Exhibit 1, pages E1A-17, E1A-18, E1A-21, and E1A-21a

Section D1, Exhibit 6, pages E6-1, and Ex6A-1, pages 1-37 and Exhibit 7, page Ex7A-1

Section D Attachment D8, page D8-3

(End of Modification No. 8)

SECTION B

STANDARD FORM 1449 CONTINUATION

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SECTION B

STANDARD FORM 1449 CONTINUATION

1.0 SCHEDULE OF SUPPLIES AND/OR SERVICES TO BE PROVIDED

The Contractor shall provide all services, facilities, and resources (except as may be expressly stated in this contract as furnished by the Government) necessary to furnish the Contract Line Item Number (CLIN) items (Tables B-4 through B-12) in accordance with the Statement of Work (SOW), Exhibits, and Documents attached hereto.

1.1 Basic Contract Firm Launch Service Requirements

CLIN	Description of Supplies and Services	Qty	Unit	Unit Price \$	Total Amount (\$)
1 SubCLIN	Launch Service for NuSTAR	1	Service		
1A	Standard Launch Services and Standard Mission Integration in accordance with the Attachment D1A, and Section D, Exhibit 2	1	Lot	NSP	N/A
1B	Non-Standard Services included in CLIN 1 above and in accordance with Attachment D1A and Section D, Exhibit 3 1.23.2.3, Alt Launch Site (RTS) Equatorial Ferry Launch 1.9.1, Increased Capacity Payload-to-GSE Interface (40-pin Auxiliary Harness) 1.9.4 Enhanced Telemetry Capabilities – Payload Data 1.11.4 Additional Instrument Purge System(s) Up to T-0	1	Lot	NSP	N/A
1C	Known Mission Unique Hardware and Software Non-recurring Items Including (if necessary to meet S/C requirements) 1 Shock Ring and/or 1 shortened avionics system	1	Lot	NSP	N/A

Table B-1: NuSTAR Launch Service Task Order

1.2 Standard Launch Service and Non-Standard Services Firm and Option
Mission Profile Matrix

For each proposed firm and option standard launch service CLIN, the launch vehicle configuration and associated non-standard services corresponding with the standard launch service are identified by an 'X' in the appropriate column and box. An asterisk (*) placed in the appropriate column and box designates those non-standard services that are included as part of the standard launch service. Finally, an 'N/A' in the appropriate column and box designates those non-standard services that are not applicable or not available for a specific launch vehicle configuration and CLIN.

LV CONFIGURATION	CLIN
	CLIN 1
Pegasus XL	X
Taurus 2110-Cat2	
Taurus 2210-Cat2	
Taurus 2110-Cat3	
Taurus 2210-Cat3	
Taurus 3110-Cat2	
Taurus 3210-Cat2	
Taurus 3110-Cat3	
Taurus 3210-Cat3	
NON-STANDARD SERVICE	
1.9.1, Increased Capacity Payload-to-GSE Interface (40-pin Auxiliary Harness)	*
1.9.4 Enhanced Telemetry Capabilities – Payload Data	*
1.11.4 Additional Instrument Purge System(s) Up to T-0	*
1.23.2.3, Alt Launch Site (RTS) Equatorial Ferry Launch	*

Table B-2: LV Configuration and Associated Non-Standard Service Matrix

1.3 Reserved

Table B-3: Reserved

1.4 Non-Standard Services Ordered Independently of a Defined Mission

The Government reserves the right to order non-standard services independently of Launch Service Task Order (LSTO) missions under this CLIN from the items listed in Table B-12. The Contracting Officer may order the services at any time by written notice to the Contractor from the effective date of the contract through calendar year 2010.

CLIN	Description of Supplies and Service	Qty	Unit	Unit Price (\$)	Total Amount (\$)
9	Non-Standard Services Ordered Independently of a Defined Mission	A/R	Service	See Table B-12	See Table B-12

Table B-4: Non-Standard Services Ordered Independently of a Defined Mission

17.0	INSPECTION SYSTEM RECORDS.....	C-25
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20.0	PLACE OF PERFORMANCE.....	C-30
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22.0	NFS 1852.227-72 DESIGNATION OF NEW TECHNOLOGY REPRESENTATIVE AND PATENT REPRESENTATIVE (JUL 1997).....	C-31
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25.0	GOVERNMENT INSIGHT AND APPROVAL.....	C-37
26.0	GOVERNMENT LAUNCH READINESS ASSESSMENT.....	C-39
27.0	LICENSES AND PERMITS FOR A LAUNCH SERVICE OPERATOR....	C-40
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29.0	CO-MANIFESTED PAYLOADS.....	C-42
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32.0	LIABILITY FOR THIRD PARTY CLAIMS.....	C-47
33.0	FAR 52.212-3 OFFEROR REPRESENTATIONS AND CERTIFICATIONS – COMMERCIAL ITEMS) (MAR 2005) ALT I () (APRIL 2002).....	C-50
34.0	FAR 52.212-5 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS – COMMERCIAL ITEMS (JAN 2004).....	C-50
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Table C-1 Launch Service Payment Schedule

Launch Service Payment Schedule						
Milestone/ Commercial Interim Payment No.	Invoice Submission Dates	Payment(s) Months Before Launch	Amount (% of Launch Service CLIN Price)	Individual Dollar Amounts (\$)	Cumulative Amount of Launch Service Payments (\$)	Termination for Convenience of the Government Repayment Schedule— Payment (% of Cumulative Payments Made to Date to be Returned to Government

The Contracting Officer will either approve the final payment within fifteen days after receipt of the final flight report, DRD C4-13 or withhold the final payment in accordance with the provisions of contract Section C, Clause 24.0. No final payment shall be made in event of partial mission success or failed mission determination by the Government in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions. In the event of a partial mission success or failed mission, the final payment shall be forfeited by the Contractor and is not recoupable. In the event of a failed mission determination, 15% of the launch service price shall be applied as a credit to another launch service or be returned to the Government if it cannot be applied to a subsequent launch service. If funds are not credited or returned within thirty days of a failed mission determination, the funds shall be subject to interest penalties at the prevailing U.S. Treasury interest rate established for Prompt Payment.

Table C-1.1: CLIN 1 (NuSTAR) Launch Service Payment Schedule

**16.0 FAR 52.246-11 HIGHER LEVEL CONTRACT QUALITY REQUIREMENT
(FEB 1999)**

The Contractor shall comply with the higher-level quality standard selected below.

	Title	Number	Date	Tailoring
<input checked="" type="checkbox"/>	ISO	9001/2000	2000	
<input type="checkbox"/>	Aerospace QMS	AS9100	2001	

17.0 INSPECTION SYSTEM RECORDS

The Contractor shall maintain records evidencing inspections in accordance with the Inspection clauses of this contract for one year after delivery of all items and/or completion of all services called for by the contract.

18.0 REQUIRED TIME OF DELIVERY FOR LAUNCH SERVICES

18.1

Table C-2: Reserved

Table C-3: Reserved

CLIN	Mission	Quantity	Launch Date (CY)
1	NuSTAR	1	August 15, 2011

Table C-4: IDIQ LSTO Delivery Schedule

18.2 Reserved

2. AMENDMENT/MODIFICATION NO. 9 3. EFFECTIVE DATE See Block 16C 4. REQUISITION/PURCHASE NO. 5. PROJECT NO. (If applicable) NLS-O

6. ISSUED BY John F. Kennedy Space Center, NASA Procurement Office/Operations Support Office Attn: OP-LS/Manalyn Achille-Argaez Kennedy Space Center, Florida 32899 CODE OP-LS 7. ADMINISTERED BY (If other than Item 6) Same as Block 6 CODE

8. NAME AND ADDRESS OF CONTRACTOR (No, street, county, State and Zip Code) Orbital Sciences Corporation, Inc. 21839 Atlantic Boulevard Dulles, Virginia 20166 (703) 406-5423 9A. AMENDMENT OF SOLICITATION NO. 9B. DATED (SEE ITEM 11) 10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B 10B. DATED (SEE ITEM 13) September 15, 2005

CODE 9X711 FACILITY CODE 11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

(a) By completing Items B and 15, and returning copies of the amendment. (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

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

- A THIS CHANGE ORDER IS ISSUED PURSUANT TO (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
- B THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (Such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
- C THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Clause 1.4, Non-Standard Services Ordered independently of a Defined Mission
- D OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, is required to sign this document and return 4 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 contract modification is to update the pricing on Table B-12, FFP List for Non-Standard Services for calendar years 2008, 2009, and 2010.

The following change page is included.

Section B pages B-13

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) HEIDI HOUGEN Administrator, Contracts		16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Manalyn Achille-Argaez Contracting Officer	
15b. CONTRACTOR/OFFEROR BY Heidi Hogen (Signature of person authorized to sign)	15c. DATE SIGNED 2/26/09	16b. UNITED STATES OF AMERICA BY Manalyn Achille-Argaez (Signature of Contracting Officer)	16c. DATE SIGNED Mar 9, 2009

3.3 Non-Standard Service Additions and Deletions

Prior to the "no-later-than ordering date," the Government has the unilateral right to add or delete the non-standard launch services identified in Table B-12, at the prices stated therein, for the non-standard launch services identified for the IDIQ missions awarded to the Contractor (Table B-8). Any such addition / deletion accomplished prior to the "no-later-than ordering date" shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for additions / deletions made after the "no later-than ordering date" shall be subject to the changes clause.

4.0 MOST FAVORED CUSTOMER

The Contractor hereby certifies the CLIN prices for standard launch services (including standard mission integration) under this contract are no higher than the lowest price charged to any other commercial or U.S. Government customer for an equivalent launch service during the twelve (12) months both preceding and following contract award, option exercise, or placement of a launch service task order. The Government shall be entitled to a one-time reduction in contract price for each standard launch service failing to meet this certification. The price credit will be equal to the difference between the standard launch service price under this contract and the lower price awarded for an equivalent launch service.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT		1. CONTRACT ID CODE	PAGE
			1 of 1

2. AMENDMENT/MODIFICATION NO. 10	3. EFFECTIVE DATE See Block 16C	4. REQUISITION/PURCHASE NO.	5. PROJECT NO. (If applicable) NLS-O
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8. ISSUED BY John F. Kennedy Space Center, NASA Procurement Office/Operations Support Office Attn: OP-LS/Marialyn Achille-Argaez Kennedy Space Center, Florida 32899	CODE OP-LS	7. ADMINISTERED BY (If other than Item 6) Same as Block 6	CODE
--	---------------	--	------

8. NAME AND ADDRESS OF CONTRACTOR (Nc., street, county, State and Zip Code) Orbital Sciences Corporation, Inc. 21839 Atlantic Boulevard Dulles, Virginia 20166 (703) 406-5423	<input type="checkbox"/>	9A. AMENDMENT OF SOLICITATION NO.
	<input type="checkbox"/>	9B. DATED (SEE ITEM 11)
	<input checked="" type="checkbox"/>	10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B
	<input type="checkbox"/>	10B. DATED (SEE ITEM 13) September 15, 2005

CODE 9X711	FACILITY CODE
------------	---------------

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

(a) By completing Items 8 and 15, and returning ____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA. (If required)

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 data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
<input checked="" type="checkbox"/>	C	THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Clause 1.5, Special Task Assignments (Studies and Analyses)
<input type="checkbox"/>	D	OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, is required to sign this document and return 4 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 contract modification is to update the pricing on Table B-6, Hourly Labor Rate -FFP List for calendar years 2008, 2009, and 2010.

The following change page is included.

Section B pages B-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) Heidi Hougou Administrator, Contracts		16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Marialyn Achille-Argaez Contracting Officer	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED 3/23/09	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED 3/23/09
BY <u>Heidi Hougou</u> (Signature of person authorized to sign)		BY <u>Marialyn Achille-Argaez</u> (Signature of Contracting Officer)	

1.5 Special Task Assignments (Studies and Analyses)

CLIN	Description of Supplies and Service	Qty*	Unit	Unit Price (\$)	Total Amount (\$)
10	Special Task Assignments - Firm Fixed-Price Composite Labor Hours	A/R	Labor Hour	See Tables B-6/7	See Tables B-6/7
	See Section B, Clause 7.0 for definitized task assignments				

* Not to exceed 500,000 Cumulative Hours for Calendar Years 2004 through 2010

Table B-5: Special Task Assignments (Studies and Analyses)

HOURLY LABOR RATE (COMPOSITE SKILL MIX AND BURDENED)	FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED				
	2006	2007	2008	2009	2010

Table B-6: Hourly Labor Rate - FFP List

The Contractor shall submit a price proposal update to convert NTE CY 2008 – 2010 labor rates into FFP labor rates at least 180 days prior to the end of CY 2007. The proposed labor rates shall be negotiated using the applicable procedures of FAR Part 15 and incorporated herein.

HOURLY LABOR RATE (COMPOSITE SKILL MIX AND BURDENED)	NOT TO EXCEED (NTE) PRICE (\$) IN CALENDAR YEAR ORDERED			
	2008	2009	2010	

Table B-7: Hourly Labor Rate - NTE Price List

1.6 IDIQ Launch Service Task Order (LSTO)

The Government reserves the unilateral right to order launch services at any time from contract award through the second quarter of CY 2010 in accordance with contract Section C, Clause 14.0, Launch Service Task Ordering Procedures. These launch services are identified in Tables B-9 and B-10 and described in Exhibits 2 and 3 to the Statement of Work. NTE prices for launch services for IDIQ missions will be part of the price evaluation and best value selection for award of an IDIQ task order contract. IDIQ launch services for TBD missions represent potential requirements for launch services in addition to the firm and optional requirements for launch services awarded under previous NLS LSTOs.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT 1. CONTRACT ID CODE PAGE 1 of 2

2. AMENDMENT/MODIFICATION NO. 11 3. EFFECTIVE DATE See Block 16C 4. REQUISITION/PURCHASE NO. 4200294350 5. PROJECT NO. (If applicable) NLS-O

6. ISSUED BY CODE OP-LS 7. ADMINISTERED BY (If other than Item 6) CODE Same as Block 6
 John F. Kennedy Space Center, NASA
 Procurement Office/Operations Support Office
 Attn: OP-LS/Leslie M. Solum
 Kennedy Space Center, Florida 32899

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and Zip Code)
 Orbital Sciences Corporation, Inc.
 21839 Atlantic Boulevard
 Dulles, Virginia 20166
 (703) 406-5423
 CODE 9X711 FACILITY CODE
 9A. AMENDMENT OF SOLICITATION NO.
 9B. DATED (SEE ITEM 11)
 10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B
 10B. DATED (SEE ITEM 13) September 15, 2005

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

(a) By completing Items 8 and 15, and returning ___ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

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

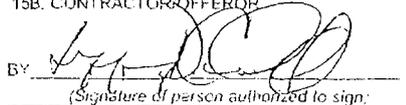
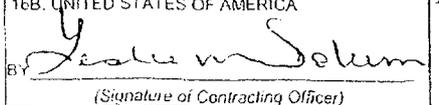
- A THIS CHANGE ORDER IS ISSUED PURSUANT TO (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
- B THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (Such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
- C THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Clause 1.5. Special Task Assignments (Studies and Analyses)
- D OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, is required to sign this document and return 4 copies to the issuing office.

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

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) JEFFREY D. CAHABELL DIRECTOR, CONTRACTS		16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Leslie M. Solum Contracting Officer	
15b. CONTRACTOR/OFFEROR BY  (Signature of person authorized to sign)	15c. DATE SIGNED 5/12/09	16b. UNITED STATES OF AMERICA BY  (Signature of Contracting Officer)	16c. DATE SIGNED 5/12/2009

2.0 TOTAL AWARD AMOUNT

The total contract price at contract award is \$100,000.

2.1 Total Contract Amount

The total firm fixed-price of the contract for all definitized work under the contract is \$890,584. This amount includes CLINs 9 and 10, and Total Amounts in Section B Clause 7.0 and 8.0.

3.0 LAUNCH SERVICE FLEXIBILITY

3.1 General

The Government reserves the unilateral right, at any time, to substitute payloads, as well as to substitute standard launch services and/or add/delete non-standard services thereto, for any mission awarded to the contractor under this contract. Substitution of those standard launch services identified in Table B-11, or addition/deletion of those non-standard services identified in Table B-12 shall be accomplished in accordance with contract clauses 3.1 and 3.2, respectively. Cost impacts resulting from payload substitution, substitution of standard launch services not listed in Table B-11 and/or additions/deletions of non-standard services not listed in Table B-12 shall be subject to the changes clause. Once payment begins on a qualified standard launch service and NASA insight commences, the Government also reserves the right to approve any Contractor initiated substitution of the launch vehicle or reallocation of launch vehicle hardware designated for a NASA mission under this contract.

3.2 Standard Launch Service Substitutions

Prior to ATP, the Government has the unilateral right to substitute the standard launch services identified in Table B-11, at the prices stated therein, for the standard launch services identified for the IDIQ missions awarded to the Contractor (Table B-8). Any such substitution accomplished prior to ATP shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for substitutions made after ATP shall be subject to the changes clause.

LAUNCH VEHICLE CONFIGURATION	FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED			
	2004	2005	2006	2007
	N/A	N/A	N/A	N/A

Table B-11: FFP List for Standard Launch Services

Special Task Assignments (Studies and Analyses) (CLIN 10) - Definitized

Task Assignment No.	Description	Hours	Firm Fixed-Price
---------------------------	-------------	-------	------------------

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

**6.0 NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)**

- (a) The sum of \$890,584 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(l) "Termination for the Government's convenience" notwithstanding.
- (c) (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until July 31, 2009.
- (2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at which, if the contract is terminated pursuant to contract Section C,

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT 1. CONTRACT ID CODE PAGE 1 of 2

2. AMENDMENT/MODIFICATION NO. 12 3. EFFECTIVE DATE See Block 16C 4. REQUISITION/PURCHASE NO. 4200294350 5. PROJECT NO. (If applicable) NLS-O

6. ISSUED BY CODE OP-LS 7. ADMINISTERED BY (If other than Item 6) CODE Same as Block 6
 John F. Kennedy Space Center, NASA
 Procurement Office/Operations Support Office
 Attn: OP-LS/Leslie M. Solum
 Kennedy Space Center, Florida 32899

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and Zip Code) 9A. AMENDMENT OF SOLICITATION NO.
 Orbital Sciences Corporation, Inc.
 21839 Atlantic Boulevard
 Dulles, Virginia 20166 9B. DATED (SEE ITEM 11)
 (703) 406-5423 10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B
 10B. DATED (SEE ITEM 13) September 15, 2005

CODE 9X711 FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

12. ACCOUNTING AND APPROPRIATION DATA (If required)

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

- A THIS CHANGE ORDER IS ISSUED PURSUANT TO (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
- B THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (Such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
- C THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Clause 1.5, Special Task Assignments (Studies and Analyses)
- D OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, is required to sign this document and return 4 copies to the issuing office.

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

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) Heidi Hougou Administrator, Contracts 16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Steve Craig Contracting Officer

15B. CONTRACTOR/OFFEROR 15C. DATE SIGNED 16B. UNITED STATES OF AMERICA 16C. DATE SIGNED
 BY Heidi Hougou 7/12/09 BY Steve Craig 7/16/2009
 (Signature of person authorized to sign) (Signature of Contracting Officer)

(Item 14 Continued)

- A. The purpose of this modification is to add funding in accordance with Section C, Clause 6.0, NFS 1852.232-77 Limitation of Funds (Fixed-Price Contract) in the amount of
The allotment date is July 31, 2009.
- B. Also, this modification hereby definitizes, adjusts and incorporates into the contract Non-Launch Services Task Order NLSO-002 and its revisions. Accordingly, the contract value is increased by
- C. As a result of the above, CLIN 10 is increased by
The total hours are increased by _____ Section B, Clause 2.1, Total
Contract Amount, is therefore increased
- D. All other terms and conditions of the Task Order remain unchanged.

The following replacement pages are provided: B-12, B-16 and C-12.

The parties hereto agree that this supplemental agreement represents a complete and equitable adjustment for the definitization of Task Order NLSO-002 listed in this contract modification, including all revisions, authorized under CLIN 10 of this contract. The Contractor hereby releases the Government from any and all liability under this contract for further equitable adjustments attributable to such facts or circumstances giving rise to Task Order NLSO-002 listed in this contract modification, that were agreed to as written.

(End of Modification 12)

2.0 TOTAL AWARD AMOUNT

The total contract price at contract award is \$100,000.

2.1 Total Contract Amount

The total firm fixed-price of the contract for all definitized work under the contract is \$899,665. This amount includes CLINs 9 and 10, and Total Amounts in Section B Clause 7.0 and 8.0.

3.0 LAUNCH SERVICE FLEXIBILITY

3.1 General

The Government reserves the unilateral right, at any time, to substitute payloads, as well as to substitute standard launch services and/or add/delete non-standard services thereto, for any mission awarded to the contractor under this contract. Substitution of those standard launch services identified in Table B-11, or addition/deletion of those non-standard services identified in Table B-12 shall be accomplished in accordance with contract clauses 3.1 and 3.2, respectively. Cost impacts resulting from payload substitution, substitution of standard launch services not listed in Table B-11 and/or additions/deletions of non-standard services not listed in Table B-12 shall be subject to the changes clause. Once payment begins on a qualified standard launch service and NASA insight commences, the Government also reserves the right to approve any Contractor initiated substitution of the launch vehicle or reallocation of launch vehicle hardware designated for a NASA mission under this contract.

3.2 Standard Launch Service Substitutions

Prior to ATP, the Government has the unilateral right to substitute the standard launch services identified in Table B-11, at the prices stated therein, for the standard launch services identified for the IDIQ missions awarded to the Contractor (Table B-8). Any such substitution accomplished prior to ATP shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for substitutions made after ATP shall be subject to the changes clause.

LAUNCH VEHICLE CONFIGURATION	FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED			
	2004	2005	2006	2007
	N/A	N/A	N/A	N/A

Table B-11: FFP List for Standard Launch Services

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

6.0 NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)

- (a) The sum of \$899,665 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(I) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(I) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(I) "Termination for the Government's convenience" notwithstanding.
- (c) (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until July 31, 2009.
(2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at which, if the contract is terminated pursuant to contract Section C,

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE
				1 of 2
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE NO.	5. PROJECT NO. (If applicable)	
13	See Block 16C	4200294350	NLS-O	
6. ISSUED BY		CODE	7. ADMINISTERED BY (If other than Item 6)	CODE
John F. Kennedy Space Center, NASA Procurement Office/Operations Support Office Attn: OP-LS/Helena Wilkas Kennedy Space Center, Florida 32899		OP-LS	Same as Block 6	
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and Zip Code)			9A. AMENDMENT OF SOLICITATION NO.	
Orbital Sciences Corporation, Inc. 21839 Atlantic Boulevard Dulles, Virginia 20166 (703) 406-5423				
CODE 9X711			9B. DATED (SEE ITEM 11)	
FACILITY CODE			10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B	
			10B. DATED (SEE ITEM 13) September 15, 2005	

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

(a) By completing Items 8 and 15, and returning ___ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

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 checked="" type="checkbox"/>	B	THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (Such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
<input type="checkbox"/>	C	THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Clause 1.5, Special Task Assignments (Studies and Analyses)
<input type="checkbox"/>	D	OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor is not, is required to sign this document and return 4 copies to the issuing office.

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

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) HEIDI HOGAN Administrator, Contracts		16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Steve Craig Contracting Officer	
15b. CONTRACTOR/OFFEROR	15c. DATE SIGNED	16b. UNITED STATES OF AMERICA	16c. DATE SIGNED
BY <u>Heidi Hogan</u> (Signature of person authorized to sign)	7/31/09	BY <u>Steve Craig</u> (Signature of Contracting Officer)	7/31/09

(Item 14 Continued)

- A. The purpose of this modification is to add funding in accordance with Section C, Clause 6.0. NFS 1852.232-77 Limitation of Funds (Fixed-Price Contract) in the amount of
The allotment date is July 31, 2009.
- B. Also, this modification hereby definitizes, adjusts and incorporates into the contract Non-Launch Services Task Order NLSO-003 and its revisions. Accordingly, the contract value is increased by
- C. As a result of the above, CLIN 10 is increased by The table on Page B-16 has been adjusted to reflect this increase, and includes a further adjustment of for the correction of the firm-fixed price of Task Assignment NLSO-001 from . The total value for CLIN 10 is now the total hours are increased Section B, Clause 2.1, Total Contract Amount, is therefore increased by
- D. All other terms and conditions of the Task Order remain unchanged.

The following replacement pages are provided: B-12, B-16 and C-12.

The parties hereto agree that this supplemental agreement represents a complete and equitable adjustment for the definitization of Task Order NLSO-003 listed in this contract modification, including all revisions, authorized under CLIN 10 of this contract. The Contractor hereby releases the Government from any and all liability under this contract for further equitable adjustments attributable to such facts or circumstances giving rise to Task Order NLSO-003 listed in this contract modification, that were agreed to as written.

(End of Modification 13)

2.0 TOTAL AWARD AMOUNT

The total contract price at contract award is \$100,000.

2.1 Total Contract Amount

The total firm fixed-price of the contract for all definitized work under the contract, is \$927,271. This amount includes CLINs 9 and 10, Total Amounts in Section B Clause 7.0 and 8.0.

3.0 LAUNCH SERVICE FLEXIBILITY

3.1 General

The Government reserves the unilateral right, at any time, to substitute payloads, as well as to substitute standard launch services and/or add/delete non-standard services thereto, for any mission awarded to the contractor under this contract. Substitution of those standard launch services identified in Table B-11, or addition/deletion of those non-standard services identified in Table B-12 shall be accomplished in accordance with contract clauses 3.1 and 3.2, respectively. Cost impacts resulting from payload substitution, substitution of standard launch services not listed in Table B-11 and/or additions/deletions of non-standard services not listed in Table B-12 shall be subject to the changes clause. Once payment begins on a qualified standard launch service and NASA insight commences, the Government also reserves the right to approve any Contractor initiated substitution of the launch vehicle or reallocation of launch vehicle hardware designated for a NASA mission under this contract.

3.2 Standard Launch Service Substitutions

Prior to ATP, the Government has the unilateral right to substitute the standard launch services identified in Table B-11, at the prices stated therein, for the standard launch services identified for the IDIQ missions awarded to the Contractor (Table B-8). Any such substitution accomplished prior to ATP shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for substitutions made after ATP shall be subject to the changes clause.

LAUNCH VEHICLE CONFIGURATION	FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED				
	2004	2005	2006	2007	
	N/A	N/A	N/A	N/A	

Table B-11: FFP List for Standard Launch Services

Table C-1: Launch Service Payment Schedule

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events, set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

**6.0 NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)**

- (a) The sum of \$927,721 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(l) "Termination for the Government's convenience" notwithstanding.
- (c) (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until August 31, 2009.
- (2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT 1. CONTRACT ID CODE PAGE
1 of 2

2. AMENDMENT/MODIFICATION NO. 14 3. EFFECTIVE DATE See Block 16C 4. REQUISITION/PURCHASE NO. 4200309807 5. PROJECT NO. (If applicable) NLS-O
6. ISSUED BY CODE OP-LS 7. ADMINISTERED BY (If other than Item 6) CODE
John F. Kennedy Space Center, NASA
Procurement Office/Operations Support Office
Attn: OP-LS/Leslie Solum
Kennedy Space Center, Florida 32899
Same as Block 6

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and Zip Code)
Orbital Sciences Corporation, Inc.
21839 Atlantic Boulevard
Dulles, Virginia 20166
(703) 406-5423
CODE 9X711 FACILITY CODE
9A. AMENDMENT OF SOLICITATION NO.
9B. DATED (SEE ITEM 11)
10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B
10B. DATED (SEE ITEM 13) September 15, 2005

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

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

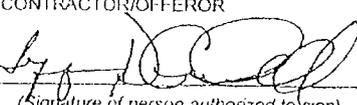
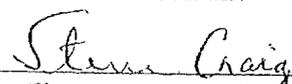
<input type="checkbox"/>	A	THIS CHANGE ORDER IS ISSUED PURSUANT TO (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
<input type="checkbox"/>	B	THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (Such as changes in paying office, appropriation data, 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: Clause 1.5, Special Task Assignments (Studies and Analyses)
X	D	OTHER (Specify type of modification and authority) Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, Paragraph 5.1

E. IMPORTANT: Contractor is not, is required to sign this document and return 4 copies to the issuing office.

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

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) JEFFREY D. CAMPBELL DIRECTOR, CONTRACTS	16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Steve Craig Contracting Officer
15b. CONTRACTOR/OFFEROR BY  (Signature of person authorized to sign)	15c. DATE SIGNED 8/18/09
16b. UNITED STATES OF AMERICA BY  (Signature of Contracting Officer)	16c. DATE SIGNED 8/18/09

(Item 14 Continued)

The purpose of this contract modification is to provide Authorization-To-Proceed for CLIN 1 Launch Service for NUSTAR and to provide funding for Milestones Payments 1 and 2.

- A. Section B, Clause 2.1, Total Contract Amount firm fixed- price of the contract for all definitized work under this contract, is increased by
- B. Section C, Clause 5.0 Launch Service Payments, Milestone Events and completion Criteria, paragraph 5.1, the contractor is hereby provided authority to proceed (ATP) with CLIN 1 Launch Service for NuSTAR.
- C. Section C, Clause 6.0, NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT), (a) is increased by from :
- D. Section C, Clause 6.0, paragraph (c)(1), the date funds are presently allotted to is changed from August 31, 2009 to November 15, 2009.
- E. Except as provided herein, all other terms and conditions of Contract NNK05LB04B, remain unchanged and in full force and effect.

Replacement pages for the above change, Page B-12 and C-12 are attached hereto.

(End of Modification 14)

2.0 TOTAL AWARD AMOUNT

The total contract price at contract award is \$100,000.

2.1 Total Contract Amount

The total firm fixed-price of the contract for all definitized work under the contract is This amount includes CLINs 1, 9 and 10, and Total Amounts in Section B Clause 7.0 and 8.0.

3.0 LAUNCH SERVICE FLEXIBILITY

3.1 General

The Government reserves the unilateral right, at any time, to substitute payloads, as well as to substitute standard launch services and/or add/delete non-standard services thereto, for any mission awarded to the contractor under this contract. Substitution of those standard launch services identified in Table B-11, or addition/deletion of those non-standard services identified in Table B-12 shall be accomplished in accordance with contract clauses 3.1 and 3.2, respectively. Cost impacts resulting from payload substitution, substitution of standard launch services not listed in Table B-11 and/or additions/deletions of non-standard services not listed in Table B-12 shall be subject to the changes clause. Once payment begins on a qualified standard launch service and NASA insight commences, the Government also reserves the right to approve any Contractor initiated substitution of the launch vehicle or reallocation of launch vehicle hardware designated for a NASA mission under this contract.

3.2 Standard Launch Service Substitutions

Prior to ATP, the Government has the unilateral right to substitute the standard launch services identified in Table B-11, at the prices stated therein, for the standard launch services identified for the IDIQ missions awarded to the Contractor (Table B-8). Any such substitution accomplished prior to ATP shall be at the price stated in Table B-11 and the CLIN price for the mission and total contract value shall be adjusted accordingly. Any cost impact to the contractor for substitutions made after ATP shall be subject to the changes clause.

LAUNCH VEHICLE CONFIGURATION	FIRM FIXED-PRICE (\$) IN CALENDAR YEAR ORDERED			
	2004	2005	2006	2007
	N/A	N/A	N/A	N/A

Table B-11: FFP List for Standard Launch Services

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

6.0 NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)

- (a) The sum of \$4,119,897 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(l) "Termination for the Government's convenience" notwithstanding.
- (c) (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until November 15, 2009.

(2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at which, if the contract is terminated pursuant to contract Section C,

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE	PAGE 1 of 2
2. AMENDMENT/MODIFICATION NO. 15	3. EFFECTIVE DATE See Block 16C	4. REQUISITION/PURCHASE NO.	5. PROJECT NO. (If applicable) NLS-O		
6. ISSUED BY John F. Kennedy Space Center, NASA Procurement Office/Operations Support Office Attn: OP-LS/Leslie Solum Kennedy Space Center, Florida 32899		CODE OP-LS	7. ADMINISTERED BY (If other than Item 6) Same as Block 6		CODE
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and Zip Code) Orbital Sciences Corporation, Inc. 21839 Atlantic Boulevard Dulles, Virginia 20166 (703) 406-5423			<input type="checkbox"/>	9A. AMENDMENT OF SOLICITATION NO.	
			<input type="checkbox"/>	9B. DATED (SEE ITEM 11)	
			<input checked="" type="checkbox"/>	10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B	
			<input type="checkbox"/>	10B. DATED (SEE ITEM 13) September 15, 2005	
CODE 9X711	FACILITY CODE				

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

(a) By completing Items 8 and 15, and returning ___ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. **FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER.** If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

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 checked="" type="checkbox"/>	B	THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (Such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
<input type="checkbox"/>	C	THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Clause 1.5, Special Task Assignments (Studies and Analyses)
<input type="checkbox"/>	D	OTHER (Specify type of modification and authority)

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

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

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 (Type or print) Leslie M. Solum Contracting Officer	
15b. CONTRACTOR/OFFEROR	15c. DATE SIGNED	16b. UNITED STATES OF AMERICA <i>Leslie M. Solum</i> BY _____ (Signature of Contracting Officer)	16c. DATE SIGNED 25 Aug 2009
BY _____ (Signature of person authorized to sign)			

(Item 14 Continued)

1. The purpose of this modification is to provide notice of a change to the designated office for submission of invoices and/or vouchers associated with Contract No. NNK05LB04B.
2. Effective September 1, 2009, all invoices and/or vouchers shall be submitted to the NASA Shared Services Center (NSSC).
3. Section C, Clause 7.0 SECURITY FOR LAUNCH SERVICE PAYMENT, FINANCING (APPLICABLE TO CLINs 1 THROUGH 10) specifically clause 7.1 is amended as follows:

7.1 Requirements for payment. Payments will be made under this contract upon Submission of properly certified invoices or vouchers by the Contractor to the NASA Shared Services Center. **A courtesy copy of such shall be submitted to the cognizant Contracting Officer on a concurrent basis, either by e-mail or hardcopy in order to facilitate the approval process.** The amount of all invoices or vouchers shall not exceed the total contract price for all CLINs, authorized LSTOs issued under the IDIQ contract, and special task assignments (studies and analyses).

4. For administrative purposes the following information is provided:

Designated Office for Payment and Submission of Invoices/Vouchers

NASA Shared Services Center (NSSC)
Financial Management Division (FMD)—Accounts Payable
Bldg. 1111, C. Road
Stennis Space Center, MS 39529
Email: NSSC-AccountsPayable@nasa.gov
Fax: 866-209-5415

Replacement page for the above change, Page C-14 is attached.

(End of Modification 15)

- (g) The provisions of this clause with respect to termination shall in no way be deemed to limit the rights of the Government under the Termination for Cause clause of this contract. The provisions of this Limitation of Funds clause are limited to the work on and allotment of funds for the items set forth in paragraph (a) of this clause. This clause shall become inoperative upon the allotment of funds for the total price of said work except for rights and obligations then existing under this clause.
- (h) Nothing in this clause shall affect the right of the Government to terminate this contract pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract.

7.0 SECURITY FOR LAUNCH SERVICE PAYMENT FINANCING (APPLICABLE TO CLINs 1 THROUGH 10)

- 7.1 *Requirements for payment.* Payments will be made under this contract upon submission of properly certified invoices or vouchers by the Contractor to the NASA Shared Services Center. **A courtesy copy of such shall be submitted to the cognizant Contracting Officer on a concurrent basis, either by e-mail or hardcopy in order to facilitate the approval process.** The amount of all invoices or vouchers submitted shall not exceed the total contract price for all CLINs, authorized LSTOs issued under the IDIQ contract, and special task assignments (studies and analyses).
- 7.2 *Security.* Pursuant to FAR Subpart 32.202-4 Security for Government Financing and 10 U.S.C. 2307(f) and 41 U.S.C. 255(f), the Government is required to obtain adequate security for Government financing. Adequate security for payments made under this contract shall be required in the form of a preferred creditor's lien. The Contractor shall grant the Government a preferred creditor's lien i.e., a first lien paramount to all other liens against all work in process sufficient to recompense the Government for all monies advanced under this contract should the Contractor's performance prove to be materially unsatisfactory.
- 7.3 *Insurance.* The Contractor represents and warrants that it maintains with responsible insurance carriers (1) insurance on plant and equipment against fire and other hazards to the extent similar properties are usually insured by others operating plants and properties of similar character in the same general locality; (2) adequate insurance against liability on account of damage to persons or property; and (3) adequate insurance under all applicable workers' compensation laws. The Contractor agrees that, until work under this contract has been completed and all payments made under this contract have been liquidated, it will maintain this insurance and furnish any certificates with respect to its insurance that the administering office may require.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT 1. CONTRACT ID CODE PAGE
1 of 1

2. AMENDMENT/MODIFICATION NO. 16 3. EFFECTIVE DATE See Block 16C 4. REQUISITION/PURCHASE NO. 4200312080 5. PROJECT NO. (If applicable) NLS-O

6. ISSUED BY CODE OP-LS 7. ADMINISTERED BY (If other than Item 6) CODE
John F. Kennedy Space Center, NASA
Procurement Office/Operations Support Office
Attn: OP-LS/Leslie Solum
Kennedy Space Center, Florida 32899
Same as Block 6

8. NAME AND ADDRESS OF CONTRACTOR (Nc., street, county, State and Zip Code)
Orbital Sciences Corporation, Inc.
21839 Atlantic Boulevard
Dulles, Virginia 20166
(703) 406-5423
9A. AMENDMENT OF SOLICITATION NO.
9B. DATED (SEE ITEM 11)
10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B
10B. DATED (SEE ITEM 13) September 15, 2005

CODE 9X711 FACILITY CODE
11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

(a) By completing Items 8 and 15, and returning ___ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)

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 checked="" type="checkbox"/>	B	THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (Such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
<input type="checkbox"/>	C	THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Clause 1.5, Special Task Assignments (Studies and Analyses)
<input type="checkbox"/>	D	OTHER (Specify type of modification and authority)

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

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)
Section C, Clause 6.0, NFS 1852.232-77, Limitation of Funds (Fixed-Price Contract) is revised to increase the sum available by

Replacement Page C-12 is attached.

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

15a. NAME AND TITLE OF SIGNER (Type or print) 16a. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)
Steve Craig
Contracting Officer

15B. CONTRACTOR/OFFEROR 15C. DATE SIGNED 16B. UNITED STATES OF AMERICA 16C. DATE SIGNED
BY (Signature of person authorized to sign) BY Steve Craig (Signature of Contracting Officer) 8/31/2009

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

**6.0 NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)**

- (a) The sum of \$4,569,897 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(l) "Termination for the Government's convenience" notwithstanding.
- (c) (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until November 15, 2009.
- (2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at which, if the contract is terminated pursuant to contract Section C,

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES 1 1	
2. AMENDMENT/MODIFICATION NO. 000017	3. EFFECTIVE DATE See Block 16C	4. REQUISITION/PURCHASE REQ. NO. 4200314079		5. PROJECT NO. (If applicable)	
6. ISSUED BY NASA/John F. Kennedy Space Center Office of Procurement MAIL CODE OP-LS ATTN: Leslie Solum KENNEDY SPACE CENTER FL 32899	CODE KSC	7. ADMINISTERED BY (If other than Item 6) NASA/Kennedy Space Center Office of Procurement MAIL CODE OP-LS ATTN: Leslie Solum KENNEDY SPACE CENTER FL 32899		CODE KSC	
8. NAME AND ADDRESS OF CONTRACTOR (No. street, county, State and ZIP Code) ORBITAL SCIENCES CORP Attn: Jeffrey D. Campbell 21839 ATLANTIC BLVD DULLES VA 20166-6850			(x)	9A. AMENDMENT OF SOLICITATION NO.	
				9B. DATED (SEE ITEM 11)	
			x	10A. MODIFICATION OF CONTRACT/ORDER NO. NNK05LB04B	
				10B. DATED (SEE ITEM 13) 09/15/2005	
CODE	FACILITY CODE				

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

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

12. ACCOUNTING AND APPROPRIATION DATA (If required), Net Increase: \$50,000.00

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

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

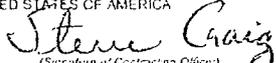
IMPORTANT: Contractor is not required to sign this document and return 0 copies to the issuing office.

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

Section C, Clause 6.0, NFS 1852.232-77 Limitation of Funds (Fixed-Price Contract) is revised to increase the sum available for payment by \$50,000 from \$4,569,897 to \$4,619,897.

Replacement Page C-12 is attached.

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

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) Steve Craig	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA  (Signature of Contracting Officer)	16C. DATE SIGNED 09/17/2009

5.9 The Contracting Officer will unilaterally determine the Contractor's accomplishment and successful completion of each milestone event. The Contracting Officer's determination of milestone event completion will include, but is not limited to, the accomplishment criteria listed for the major milestone events set forth in Attachment D8, Work Plan. In addition, the Contracting Officer will determine if the following are complete for each payment requested: all Data Requirements List (DRL) data item deliverables for which delivery is required prior to the requested payment have been delivered and the Contracting Officer has approved those data items requiring Government approval; there are no proposals due from the Contractor which have exceeded the time period in the contract Changes clause; and all previous events have been met and payment has been approved by the Contracting Officer. Approval of the final payment will be made in accordance with contract Section C, Clause 24.0, Mission Success Determination, Investigation, and Corrective Actions.

6.0 **NFS 1852.232-77 LIMITATION OF FUNDS (FIXED-PRICE CONTRACT)
(MAR 1989)**

- (a) The sum of \$4,619,897 is presently available for payment and allotted to this contract. It is anticipated that from time to time additional funds will be allocated to the contract as required by the payment schedule in contract Section C, Clause 5.0, Launch Service Payments, Milestone Events and Completion Criteria, until the total price of said CLINs is allotted.
- (b) The Contractor agrees to perform or have performed work on the items specified in paragraph (a) of this clause up to the point at which, if this contract is terminated pursuant to contract Section C, Clause 1.0(l) "Termination for the Government's convenience" of this contract, the total amount payable by the Government pursuant to contract Section C, Clause 1.0(l) would equal the amount retained by the Contractor pursuant to Section C, Clause 5.0 and Table C-1. The Contractor is not obligated to continue performance of the work beyond that point. The Government is not obligated in any event to pay or reimburse the Contractor more than the amount from time to time allotted to the contract, anything to the contrary in contract Section C, Clause 1.0(l) "Termination for the Government's convenience" notwithstanding.
- (c)
 - (1) It is contemplated that funds presently allotted to this contract will cover the work to be performed until November 15, 2009.
 - (2) If funds allotted are considered by the Contractor to be inadequate to cover the work to be performed until that date, or an agreed date substituted for it, the Contractor shall notify the Contracting Officer in writing when within the next sixty (60) days the work will reach a point at which, if the contract is terminated pursuant to contract Section C,