

**AMENDMENT NO. 1 to  
NONREIMBURSABLE SPACE ACT AGREEMENT  
BETWEEN  
THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AND UNITED LAUNCH ALLIANCE  
FOR  
COMMERCIAL SPACE CAPABILITIES COLLABORATION**

PURPOSE OF AMENDMENT AND AGENCY COMMITMENT

The purpose of this Amendment No. 1 to Space Act Agreement No. SAA-QA-14-18884 between the National Aeronautics and Space Administration (“NASA”) and United Launch Alliance (“Partner” or “ULA”), effective December 18, 2014 (the “Agreement”), is to (1) bring the SAA text into agreement with United Launch Alliance’s (ULA) current launch vehicle development plans and clarify content of Milestones, (2) clarify NASA and ULA responsibilities, (3) clarify NASA furnishing of information and services, (4) update NASA and ULA points of contact and ULA signatory, and (5) extend the period of performance under the Agreement.

Now therefore, in consideration of the mutual undertakings in this Amendment, the Agreement is amended in accordance with Article 21 of the Agreement as follows:

**I. Amendment to ARTICLE 2. PURPOSE**

The following modification is made to Article 2:

The sentence “The scope of the activity and alignment with NASA’s strategy for human space exploration is as described in the Executive Summary in Appendix 1.” is deleted and replaced with “The Parties are working in collaboration to perform certain tasks, including tasks identified in Appendix 3, and additional work identified in this Agreement. Partner’s activity, as identified in Article 4, is related to this Agreement but is not a Partner responsibility under this Agreement, except where described elsewhere in this Agreement. This collaboration is aligned with NASA’s strategy for human space exploration as described in the Executive Summary in Appendix 1.”

**II. Amendment to ARTICLE 3. RESPONSIBILITIES**

A. Article 3.A.2 is deleted entirely and replaced with:

Provide access to requested NASA technical data, lessons learned, expertise support, services, facilities, and NASA-developed technologies, on a non-interference basis as

resources permit. NASA furnished services, facilities, and technologies that may be provided are identified in Appendix 3.

B. The following modification is made to Article 3.A.5:

“Within” is deleted and replaced with “If requested by ULA, and within”.

C. Article 3.B is deleted entirely and replaced with:

Partner will use reasonable efforts to:

1. Provide NASA with data regarding its progress towards the milestones identified in Article 4.
2. Conduct a quarterly meeting with NASA regarding the past quarter’s milestones, demonstrating that the success criteria have been met, and discuss upcoming activities.
3. Fulfill its obligations in Appendix 3.

**III. Amendment to ARTICLE 4. SCHEDULES AND MILESTONES**

Article 4 is deleted entirely and replaced with:

The Milestones below are intended to provide a measure of Partner’s overall progress, but are not a Partner responsibility under this Agreement, except where described elsewhere in this Agreement:

Milestone	Description	Date
<b>A. Hydrogen (H2) / Oxygen (O2) Thruster</b>		
	Hardware qualification review Success criteria: ULA Chief engineer concurrence that hardware is qualified for flight.	██████████
<b>B. Integrated Vehicle Fluids (IVF) and Advanced Avionics</b>		
	Avionics Technical Interchange Meeting (TIM): Review IVF controller Success Criteria: ULA concurrence that IVF controller meets IVF requirements and that development plan meets cost, schedule and performance objectives.	██████████
	██████████ Success Criteria: Demonstrate ██████████ ██████████ meets ULA IVF requirements.	██████████
	██████████ Success Criteria: ██████████ ██████████	██████████

	<p>Success Criteria: ULA determines [REDACTED] satisfy Advanced Cryogenic Evolved Stage (ACES) requirements.</p>	[REDACTED]
	<p>Phase F Integrated stage test: Test protoflight IVF with LH2 and Liquid Oxygen (LO2) tanks. Success Criteria: ULA determines if IVF can satisfy ACES requirements.</p>	[REDACTED]
	<p>Component qualification complete Success Criteria: ULA Chief engineer concurrence that IVF components meet ULA requirements.</p>	[REDACTED]
	<p>[REDACTED] Success Criteria: ULA Chief engineer concurrence that hardware is qualified for flight.</p>	[REDACTED]
<b>C. Low Cost Upper Stage Engine</b>		
	<p>[REDACTED] Engine Operation Review Success Criteria: ULA concurrence that the [REDACTED] scale engine successfully demonstrated operation and the program is ready to proceed to full scale engine development.</p>	[REDACTED]
	<p>[REDACTED] Success Criteria: ULA Principal Investigator concurs [REDACTED] meets ULA's requirements for [REDACTED].</p>	[REDACTED]
	<p>[REDACTED] Success Criteria: ULA determines [REDACTED] satisfy ULA's goals.</p>	[REDACTED]
<b>D. Cryogenic Storage and Handling</b>		
	<p>Atmospheric test Success Criteria: Successfully demonstrate Liquid Nitrogen (LN2) loading and expulsion; tank heating and pressurization efficiency.</p>	[REDACTED]
<b>E. Upper Stage Mission Kit</b>		
	<p>eXperimental Enhanced Upper Stage (XEUS) Concept Review TIM Success Criteria: ULA review of concept and concurrence on forward development plan.</p>	[REDACTED]
	<p>Lunar Surface Access Architecture TIM Success Criteria: ULA determination if XEUS is a promising option for lunar surface access that enables customer mission requirements.</p>	[REDACTED]
	<p>XEUS Mission Kit Concept Review Success criteria: ULA determines that XEUS development satisfies ULA Concept Review requirements.</p>	[REDACTED]
	<p>XEUS Propulsion System Demonstration Success criteria: ULA determines that propulsion system meets demonstration requirements.</p>	[REDACTED]





	ACES Design Certification Review (DCR) Success Criteria: ULA determines that ACES satisfies ULA DCR requirements.	
	Success Criteria: [REDACTED]	
	ACES First Flight Success Criteria: ULA determines that first flight of Vulcan ACES was successful.	
	Success Criteria: ULA determines that [REDACTED].	

**IV. Amendment to ARTICLE 8. LIABILITY AND RISK OF LOSS**

Article 8 is deleted entirely and replaced with:

A. Each Party hereby waives any claim against the other Party, employees of the other Party, the other Party’s Related Entities (including but not limited to contractors and subcontractors at any tier, grantees, investigators, customers, users, and their contractors or subcontractor at any tier), or employees of the other Party’s Related Entities for any injury to, or death of, the waiving Party’s employees or the employees of its Related Entities, or for damage to, or loss of, the waiving Party’s real or personal property or the real or personal property of its Related Entities arising from or related to activities conducted under this Agreement, whether such injury, death, damage, or loss arises through negligence or otherwise, except in the case of willful misconduct.

B. Each Party further agrees to extend this cross-waiver to its Related Entities by requiring them, by contract or otherwise, to waive all claims against the other Party, Related Entities of the other Party, and employees of the other Party or of its Related Entities for injury, death, damage, or loss arising from or related to activities conducted under this Agreement. Additionally, each Party shall require that their Related Entities extend this cross-waiver to their Related Entities by requiring them, by contract or otherwise, to waive all claims against the other Party, Related Entities of the other Party, and employees of the other Party or of its Related Entities for injury, death, damage, or loss arising from or related to activities conducted under this Agreement.

**V. Amendment to ARTICLE 9. INTELLECTUAL PROPERTY RIGHTS – DATA RIGHTS**

A. The following modification is made to Article 9.A.10:

In the first sentence, the word “under” is deleted and replaced with “for restricted data as described in”. Also in the last sentence the text “When such markings are authorized,” is added before the word “NASA” at the start of the sentence.

B. The following modification is made to Article 9.B:

In the second sentence, the word “The” is deleted and replaced with “Such”. Also the last sentence “Notwithstanding...Agreement.” is deleted in its entirety.

C. The following modification is made to Article 9.C:

The phrase “five (5) years” is deleted in its entirety and replaced with “the period of time specified in Appendix 3”. Also in the second paragraph the text “, except as identified in Appendix 3,” is added immediately after the first occurrence of “Partner”.

D. The following modification is made to Article 9.E:

The opening parentheses “(” is added immediately preceding the word “two”.

E. Article 9.H.3 is deleted in its entirety and replaced with:

Disclosing Party provides the following Data to Receiving Party. The lists below may not be comprehensive, are subject to change, and do not supersede any restrictive notice on the Data.

- a. Background Data: As marked.
- b. Third Party Proprietary Data: As marked.
- c. Controlled Government Data: As marked.
- d. NASA software and related Data will be provided to Partner under a separate Software Usage Agreement (SUA). Partner shall use and protect the related Data in accordance with this Article. Unless the SUA authorizes retention, or Partner enters into a license under 37 C.F.R. Part 404, the related Data shall be disposed of as NASA directs. Such software will include ROcket Engine Transient Simulation Software (ROCETS) and Chemical Equilibrium Applications (CEA) Software.

D. The following modification is made to Article 9.H.4.c:

The text “unless waived by Partner in such written consent” is added to the end of the last sentence.

## **VI. Amendment to ARTICLE 10. INTELLECTUAL PROPERTY RIGHTS - INVENTION AND PATENT RIGHTS**

In Article 10.G.2 delete “therefore” and replace with “therefor”.

## **VII. Amendment to ARTICLE 16. TERM OF AGREEMENT**

Article 16 is deleted entirely and replaced with:

This Agreement becomes effective upon the date of the last signature below (“Effective Date”) and shall remain in effect until June 30, 2022.

**VIII. Amendment to ARTICLE 18. CONTINUING OBLIGATIONS**

The following modification is made to Article 18:

The word “clauses” is added immediately after the word “related”.

**IX. Amendment to ARTICLE 19. POINTS OF CONTACT**

The points of contact in Article 19 are deleted entirely and replaced with:

NASA  
Philip R. McAlister  
Director, Commercial Spaceflight  
Development Division  
philip.mcalister@nasa.gov  
Telephone: 202-358-0712  
NASA Headquarters  
300 E. Street SW  
Code HEOMD  
Washington, DC 20546

United Launch Alliance  
Renee De Rocher  
Contracts Administrator  
[REDACTED]  
Telephone: [REDACTED]  
Fax: [REDACTED]  
9501 E. Panorama Circle  
Centennial, CO 80112

**X. Incorporation of new ARTICLE 25. NASA FURNISHED INFORMATION AND SERVICES**

The following is added to the Agreement as new Article 25:

**ARTICLE 25. NASA FURNISHED INFORMATION AND SERVICES**

A. NASA may, at its sole discretion and on terms to be negotiated between the Parties, provide Partner additional NASA services, technical expertise, or Government Property. Access to NASA-developed technologies may require a separate license agreement. Access to NASA software may require a separate software usage agreement. NASA equipment used at Partner facilities will be in accordance with a separate NF-893 Loan Agreement. Additional NASA services, technical expertise, or Government Property may be provided on a non-reimbursable basis. Specific services and Government Property will be identified in Appendix 3 to this Agreement. Partner shall remain solely responsible for completion of its milestones under this Agreement regardless of the availability or use of such optional NASA services, technical expertise, or Government Property.



B. There is no Government Furnished Property or Services furnished under this Agreement except for those that may be provided in Article 25.A. However, Partner has the ability to enter into separate reimbursable Space Act agreements with NASA Centers to use NASA resources in performance of this Agreement. The terms and conditions of other Space Act agreements will govern the use of NASA resources not being provided under this Agreement.

## **XI. Amendment to Appendix 1. Executive Summary**

A. In the first paragraph, the text “Atlas V” is deleted and replaced with “currently-existing” and the text “Delta IV” is replaced with “planned”.

B. The third paragraph is modified to read:

The purpose of the proposed partnership is for ULA and NASA to share expertise and ongoing development to enhance both NASA’s and ULA’s capability to meet our respective charters. For the proposed hardware development collaborations ULA and NASA will exchange equipment, services, and data with both NASA and ULA benefitting from the results.”

C. In the first bullet under Upper Stage Systems Focus the text “ops” is replaced with “operations”.

D. In the **Relevance to NASA** section the word “industry” is added immediately after “commercial” at end of fourth sentence.

E. In the **Business and Technical Approach...** section the word “codified” is deleted. Also in the second sentence the word “signed” is added immediately before “agreements”.

F. In the **Government Resources Requested...** section the first bullet is modified to read: “ULA requests technical interchange with NASA experts pursuing related capabilities; sharing hard-won lessons learned will accelerate development.”

G. In the **Government Resources Requested...** section the third bullet is modified to read: “Access to NASA labs and testing in NASA facilities including: 3D printing, Exploration Systems Test Facility, and TS-300. Includes NASA personnel support & testing commodities.”.

## **XII. Amendment to Appendix 2. Background Data**

The table and all text in Appendix 2 is deleted in its entirety and the title of Appendix 2 is changed from “Background Data” to “Reserved”.

## **XIII. Incorporation of new Appendix 3. NASA Furnished Services, Facilities, and Technologies**

The following is added to the Agreement as new Appendix 3:


In accordance with Article 9 Intellectual Property Rights – Data Rights, any Data First Produced by NASA under this Agreement which does not have a period of time specified in this Appendix 3 will be protected for a period of five (5) years after its development. All other time periods specified herein for the protection of data also commence after its development.

<u>NASA Furnished Services, Facilities, and Technologies</u>	<u>Corresponding Partner Obligations</u>	<u>Data Rights</u>
<p>1) NASA developed [REDACTED] prototype(s) applicable to [REDACTED] in support of Article 4.C Low Cost Upper Stage Engine. Activities may include:</p> <ul style="list-style-type: none"> <li>a. NASA design, development, and manufacture of prototype(s).</li> <li>b. Test at NASA and/or Partner furnished facilities in the United States to characterize performance, materials, margins, and design. Tested individually and/or incorporated with Partner furnished rocket engine components.</li> </ul>	<p>1) Partner provides following: [REDACTED]</p>	<p>[REDACTED]</p> <p>Partner data specific to [REDACTED] and developed at private expense will be Partner Background Data or Partner Proprietary Data when marked and such markings are authorized.</p> <p>All controlled NASA information for [REDACTED] will be considered Controlled Government Data or Data First Produced by NASA, depending on its first production and in accordance with its markings. Article 9.C protection period shall be two (2) years.</p> <p>Data from tests performed by Partner will be considered Data First Produced by Partner.</p> <p>Data from tests performed by NASA will be considered Data First Produced by NASA. Article 9.C protection period shall be two (2) years.</p>

<u>NASA Furnished Services, Facilities, and Technologies</u>	<u>Corresponding Partner Obligations</u>	<u>Data Rights</u>
<p>2) NASA developed [REDACTED] prototype(s) applicable to [REDACTED] in support of Article 4.C Low Cost Upper Stage Engine. Activities may include:</p> <ul style="list-style-type: none"> <li>a. NASA design, development, and manufacture of prototype(s).</li> <li>b. Test at NASA and/or Partner furnished facilities in the United States to characterize performance, materials, margins, and design. Tested individually and/or incorporated with Partner furnished rocket engine components.</li> </ul>	<p>2) Partner provides following:</p> <p>[REDACTED]</p>	<p>[REDACTED]</p> <p>Partner data specific to the [REDACTED] and developed at private expense will be Partner Background Data or Partner Proprietary Data when marked and such markings are authorized.</p> <p>All controlled NASA information for [REDACTED] will be considered Controlled Government Data or Data First Produced by NASA, depending on its first production and in accordance with its markings. Article 9.C protection period shall be two (2) years.</p> <p>Data from tests performed by Partner will be considered Data First Produced by Partner.</p> <p>Data from tests performed by NASA will be considered Data First Produced by NASA. Article 9.C protection period shall be two (2) years.</p>

<u>NASA Furnished Services, Facilities, and Technologies</u>	<u>Corresponding Partner Obligations</u>	<u>Data Rights</u>
<p>3) NASA developed [REDACTED] prototype(s) applicable to [REDACTED] in support of Article 4.C Low Cost Upper Stage Engine.</p> <p>Activities may include:</p> <p>a. NASA design, development, and manufacture of prototype(s).</p> <p>b. Test at NASA and/or Partner furnished facilities in the United States to characterize performance, materials, margins, and design. Tested individually and/or incorporated with Partner furnished rocket engine components.</p>	<p>3) Partner provides following:</p> <p>a. Data for heat exchanger interfaces</p> <p>[REDACTED]</p>	<p>[REDACTED]</p> <p>Partner data specific to [REDACTED] and developed at private expense will be Partner Background Data or Partner Proprietary Data when marked and such markings are authorized.</p> <p>All controlled NASA information for [REDACTED] will be considered Controlled Government Data or Data First Produced by NASA, depending on its first production and in accordance with its markings. Article 9.C protection period shall be three (3) years.</p> <p>Data from tests performed by Partner will be considered Data First Produced by Partner.</p> <p>Data from tests performed by NASA will be considered Data First Produced by NASA. Article 9.C protection period shall be three (3) years.</p>

<u>NASA Furnished Services, Facilities, and Technologies</u>	<u>Corresponding Partner Obligations</u>	<u>Data Rights</u>
<p>4) NASA developed [REDACTED] prototype(s) applicable to [REDACTED] in support of Article 4.C Low Cost Upper Stage Engine. Activities may include:</p> <ul style="list-style-type: none"> <li>a. NASA design, development, and manufacture of prototype(s).</li> <li>b. Test at NASA and/or Partner furnished facilities in the United States to characterize performance, materials, margins, and design. Tested individually and/or incorporated with Partner furnished tankage and/or engine systems.</li> </ul>	<p>4) Partner provides following: [REDACTED]</p>	<p>Partner proprietary data specific to the interfaces of the tankage and/or engine systems that is first produced under this Agreement and provided to NASA for its performance of activities under this Appendix will be considered Data First Produced by Partner.</p> <p>Partner data specific to [REDACTED] and developed at private expense will be Partner Background Data or Partner Proprietary Data when marked and such markings are authorized.</p> <p>All controlled NASA information for the [REDACTED] will be considered NASA Controlled Government Data or Data First Produced by NASA, depending on its first production and in accordance with its markings. Article 9.C protection period shall be one (1) year.</p> <p>Data from tests performed by Partner will be considered Data First Produced by Partner.</p> <p>Data from tests performed by NASA will be considered Data First Produced by NASA. Article 9.C protection period shall be one (1) year.</p>

<u>NASA Furnished Services, Facilities, and Technologies</u>	<u>Corresponding Partner Obligations</u>	<u>Data Rights</u>
<p>5) NASA developed propellant inventory and condition sensor system prototypes (e.g. the Fiber Optic Sensor System (FOSS)) applicable to Partner launch vehicles in support of Article 4.F Upper Stage Cryogenic Storage Technologies.</p> <p>Activities may include:</p> <p>a. NASA design, development, and manufacture of prototype(s).</p> <p>b. Test at NASA and/or Partner furnished facilities in the United States to characterize performance, materials, margins, and design. Tested individually and/or incorporated with Partner furnished propellant tank components and data acquisition and control systems.</p>	<p>5) Partner provides following:</p> <p>a. Data for sensor system interfaces to, and operating conditions of, ULA launch vehicle and/or ground simulators.</p> <p>b. Launch vehicle ground simulator test stands, propellant tank components, and/or data acquisition and control systems (if needed).</p>	<p>Partner data specific to Partner's launch vehicle(s) and developed at private expense will be Partner Background Data or Partner Proprietary Data when marked and such markings are authorized.</p> <p>All controlled NASA information for the sensor systems will be considered NASA Controlled Government Data or Data First Produced by NASA, depending on its first production and in accordance with its markings. Article 9.C protection period shall be one (1) year.</p> <p>Data from tests performed by Partner will be considered Data First Produced by Partner.</p> <p>Data from tests performed by NASA will be considered Data First Produced by NASA. Article 9.C protection period shall be one (1) year.</p>
<p>6) NASA developed launch vehicle thermal insulation prototypes applicable to Partner launch vehicles in support of Article 4.F Upper Stage Cryogenic Storage Technologies.</p> <p>Activities may include:</p> <p>a. NASA design, development, and manufacture of prototype(s).</p> <p>b. Test at NASA and/or Partner furnished facilities in the United States to characterize performance, materials, margins, and design. Tested individually and/or incorporated with Partner furnished propellant tank components.</p>	<p>6) Partner provides following:</p> 	<p>Partner data specific to Partner's launch vehicle(s) [redacted] and [redacted] developed at private expense will be considered Partner Background Data or Partner Proprietary Data when marked and such markings are authorized.</p> <p>All controlled NASA information for the thermal insulation prototype(s) will be considered NASA Controlled Government Data or Data First Produced by NASA, depending on its first production and in accordance with its markings. Article 9.C protection period shall be one (1) year.</p> <p>Data from tests performed by Partner will be considered Data First Produced by Partner.</p> <p>Data from tests performed by NASA will be considered Data First Produced by NASA. Article 9.C protection period shall be one (1) year.</p>

<u>NASA Furnished Services, Facilities, and Technologies</u>	<u>Corresponding Partner Obligations</u>	<u>Data Rights</u>
<p>7) NASA developed analytical models of [REDACTED] using NASA developed ROCETS and CEA engine modelling software in support of Article 4.C Low Cost Upper Stage Engine.</p> <p>Activities may include:</p> <p>[REDACTED]</p> <p>d. NASA will provide Software Usage Agreement(s) as required.</p>	<p>7) Partner provides following:</p> <p>[REDACTED]</p>	<p>Improvements and modifications first produced and made by NASA and/or its Related Entities to the ROCETS and/or CEA engine modelling software for modelling [REDACTED] will be considered Data First Produced by NASA and/or an Invention Made by NASA and/or its Related Entities. Article 9.C protection period shall be for three (3) years. Improvements and modifications to the software will be subject to a Software Usage Agreement if transferred to ULA or its Related Entities.</p> <p>Models of [REDACTED] produced by NASA and/or its Related Entities will be considered Data First Produced by NASA. Article 9.C protection period shall be three (3) years.</p> <p>Engine system and/or component improvements resulting from engine modelling that are first produced by NASA and/or its Related Entities will be considered Data First Produced by NASA. Article 9.C protection period shall be three (3) years. Title to any inventions made as part of this activity will remain with the respective inventing party(ies).</p> <p>Data from tests performed by Partner will be considered Data First Produced by Partner.</p> <p>Data from tests performed by NASA will be considered Data First Produced by NASA. Article 9.C protection period shall be three (3) years.</p>

<u>NASA Furnished Services, Facilities, and Technologies</u>	<u>Corresponding Partner Obligations</u>	<u>Data Rights</u>
<p>8) Space radiation environment testing of Partner provided prototype [REDACTED] in NASA furnished facilities in support of Article 4.B Integrated Vehicle Fluids and Advanced Avionics. Activities may include: [REDACTED]</p> <p>NASA will furnish and coordinate testing, perform post-test analysis, and provide copy of all test data, post-test analysis, and report(s) to Partner.</p>	<p>8) Partner provides following: [REDACTED]</p>	<p>Partner proprietary data specific to [REDACTED] that is first produced under this Agreement and provided to NASA for testing under this Appendix will be considered Data First Produced by Partner. Partner data specific to [REDACTED] and developed at private expense will be Partner Background Data or Partner Proprietary Data when marked and such markings are authorized.</p> <p>Test results and post-test analysis and report(s) produced by NASA will be considered Data First Produced by NASA. Article 9.C protection period shall be five (5) years.</p>



<u>NASA Furnished Services, Facilities, and Technologies</u>	<u>Corresponding Partner Obligations</u>	<u>Data Rights</u>
<p>9) NASA developed [REDACTED] prototype(s) applicable to [REDACTED] in support of Article 4.F Upper Stage Cryogenic Storage Technologies.</p> <p>Activities may include:</p> <ul style="list-style-type: none"> <li>a. NASA design, development, and manufacture of prototype(s).</li> <li>b. Test at NASA and/or Partner furnished facilities in the United States to characterize performance, materials, margins, and design. Tested individually and/or incorporated with Partner furnished [REDACTED]</li> </ul>	<p>9) Partner provides following:</p> <p>[REDACTED]</p>	<p>Partner proprietary data specific to [REDACTED] that is first produced under this Agreement and provided to NASA for purposes of designing the [REDACTED] will be considered Data First Produced by Partner</p> <p>Partner data specific to the [REDACTED] and developed at private expense will be Partner Background Data or Partner Proprietary Data when marked and such markings are authorized.</p> <p>All controlled NASA information for the [REDACTED] will be considered NASA Controlled Government Data or Data First Produced by NASA, depending on its first production and in accordance with its markings. Article 9.C protection period shall be five (5) years.</p> <p>Data from tests performed by Partner will be considered Data First Produced by Partner.</p> <p>Data from tests performed by NASA will be considered Data First Produced by NASA. Article 9.C protection period shall be five (5) years.</p>

**XIV. Renumbering and amendment of ARTICLE 25. SIGNATORY AUTHORITY**

Article 25 is renumbered as Article 26.

The name "Diem Reising" is deleted and replaced with "Renee De Rocher".

**APPROVALS**

The signatories to this Amendment covenant and warrant that they have authority to execute this Amendment No. 1 and agree to the above terms and conditions.

**NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION**

BY: Philip McAlister

Philip R. McAlister  
Director, Commercial Spaceflight  
Development Division

Date: March 28, 2017

**UNITED LAUNCH ALLIANCE**

BY: Renee De Rocher

Renee De Rocher  
Contracts Administrator

Date: March 27, 2017