SPACE ACT AGREEMENT NO. XXXXX
BETWEEN
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND
UNITED LAUNCH ALLIANCE, L.L.C.
FOR
COMMERCIAL CREW DEVELOPMENT (CCDev)

BACKGROUND

NASA has established the Commercial Crew and Cargo Program Office at the Johnson Space Center as part of the Exploration Systems Mission Directorate. The objectives of the Commercial Crew and Cargo Program are to:

- Implement U.S. Space Exploration policy with investments to stimulate the commercial space industry;
- Facilitate U.S. private industry demonstration of cargo and crew space transportation capabilities with the goal of achieving safe, reliable, cost effective access to low-Earth orbit; and
- Create a market environment in which commercial space transportation services are available to Government and private sector customers.

NASA has been allocated funds from the American Recovery and Reinvestment Act of 2009 (ARRA) to support exploration activities. The purposes of the ARRA are to:

- Preserve and create jobs and promote economic recovery;
- Assist those most impacted by the recession;
- Provide investments needed to increase economic efficiency by spurring technological advances in science and health;
- Invest in transportation, environmental protection, and other infrastructure that will provide long-term economic benefits; and
- Stabilize State and local government budgets, in order to minimize and avoid reductions in essential services and counterproductive state and local tax increases.

This Space Act Agreement (the "Agreement") represents ULA's and NASA's commitment to meet the purposes of ARRA by making significant progress on commercial crew spaceflight long lead capabilities, technologies, and commercial crew risk mitigation tasks as well as accelerate and mature the design and development of ULA's commercial crew space transportation system.

ARTICLE 1. AUTHORITY

This Agreement is entered into by the National Aeronautics and Space Administration, located at 300 E Street, SW, Washington, D.C. (hereinafter referred to as "NASA" or Government), and United Launch Alliance, L.L.C., (hereinafter referred to as "ULA" or "Participant") with a place of business at 9100 E. Mineral Circle, Centennial, Colorado. NASA's authority to enter into this Agreement is in accordance with the authority set forth in Sections 203(c)(5) and 203(c)(6) of the National Aeronautics and Space Act of 1958, as amended. This agreement will be implemented by NASA at the Lyndon B. Johnson Space Center in Houston, Texas.

ARTICLE 2. PURPOSE

The purpose of this Agreement is to partially fund the development of system concepts, key technologies, and capabilities that could ultimately be used in commercial crew human space transportation systems. This development work must show, within the timeframe of the Agreement, significant progress on commercial crew spaceflight long lead capabilities, technologies, and commercial crew risk mitigation tasks as well as mature the design and development of ULA's commercial crew space transportation concept. ULA will receive payments from NASA upon successful completion of agreed upon milestones as described in Appendix 2 of this Agreement.

ARTICLE 3. RESPONSIBILITIES

A. ULA shall:

(1) Conduct the CCDev effort according to the milestones identified in Appendix 2 to this Agreement.

(2) Provide required financial reporting and technical progress reports as required under Article 5 of this Agreement and to support the milestones identified in Appendix 2 to this Agreement.

(3) Meet all applicable ARRA requirements as identified in this Agreement and related ARRA guidance.

B. NASA shall:

(1) Provide milestone payments to ULA upon successful completion of each milestone, subject to limitations noted below.

(2) Provide appropriate oversight of ARRA funds expended under this Agreement.

ARTICLE 4. SCHEDULE AND MILESTONES

The scheduled major milestones and acceptance criteria for each milestone for the CCDev effort are identified in Appendix 2 to this Agreement

ARTICLE 5. FINANCIAL OBLIGATIONS

A. NASA's Obligation. The Government's liability to make payments to ULA is limited to only those funds obligated under this Agreement or by amendment to the Agreement. NASA may obligate funds to the Agreement incrementally.

B. Acceptance and Payment for Milestones.

(1) ULA shall notify the NASA Principal Points of Contact at least 30 calendar days prior to the completion of any milestone to arrange for the NASA Technical Contact or designee to witness the event or accept delivery of documents. NASA shall have 30 calendar days to determine whether the milestone event meets its corresponding acceptance criteria as described in Appendix 2 of this Agreement and shall notify ULA of NASA's acceptance or non-acceptance. Disagreement about the successful accomplishment of a milestone shall be deemed a Dispute and resolved in accordance with Article 19 of this Agreement. NASA and ULA agree that time is of the essence for the payment of milestones hereunder and each will make best efforts to ensure that milestones are accepted (if appropriate) and invoiced prior to September 30, 2010, the end of NASA's 2010 fiscal year.
(2) ULA shall be able to submit an invoice requesting payment upon the accomplishment and acceptance by NASA of the milestone as identified and described in Appendix 2 of this Agreement. ULA shall submit an invoice via e-mail to the NASA Shared Services Center at NSSC-AccountsPayable@nasa.gov. There shall be no more than one (1) invoice per e-mail submission. After receipt and review of the invoice, the NASA Shared Services Center will coordinate with the NASA Administrative Contact to authorize payment. Subject to change only through written Agreement modification, payment shall be made via electronic funds transfer to the address set forth below:

Bank Account of Payee: [redacted]
Bank: [redacted]
Address: [redacted]
[redacted]
Routing Transit Number: [redacted]
Depositor Account Title:
Depositor Number:

(3) The following information shall be included on each invoice:
Agreement Number
Invoice Number

A description of milestone event
Terms of Payment
Payment Office
Agreed Milestone Amount

(4) Financial Records and Reports:

(a) Registration with FederalReporting.gov. Within 10 business days of the execution of this Agreement, ULA must register with www.FederalReporting.gov to ensure reporting requirements under this Agreement will be met in a timely fashion.

(b) Quarterly Financial Reporting. Pursuant to Section 1512 of the American Recovery and Reinvestment Act (ARRA), not later than 10 business days after the end of each calendar quarter, the participant shall submit a financial report to NASA through www.FederalReporting.gov.

The quarterly financial report shall include:

(1) For ULA:

(i) identification of the program or project title as "CCDev"
(ii) the Space Act Agreement Number for this Agreement;
(iii) the amount of ARRA funds invoiced during the reporting period;
(iv) a summary of the monthly technical reports provided under Article 5, section 6, below, since the previous quarterly report;
(v) an assessment of progress toward completion of the milestones set forth in Appendix 2 of this Agreement;
(vi) a narrative description of the employment impact of ULA's use of ARRA funding, including number and type of jobs created or jobs retained by ULA; and

(2) For ULA first tier contractors/partners receiving over $25,000 in ARRA funding from ULA:

(i) contractor/partner name, DUNS number, physical address and primary location of performance of activities using ARRA funding;
(ii) total amount of ARRA funding anticipated to be provided, date of relevant contract or agreement; NAICS code and identifying NASA as the funding agency;
(iii) a description of the products or services being provided by the contractor/partner, including the overall purpose and expected outcome from expenditure of ARRA funding; and

(3) For (a) ULA first tier contractors/partners receiving less than $25,000 in ARRA funding from ULA, (b) first tier contractors/partners receiving ARRA funding from ULA but who had less than $300,000 in gross income in tax year 2008, and (c) individuals receiving ARRA funding from ULA: ULA shall report only the aggregate number of such contractors/partners and individuals and the aggregate total amount of ARRA funding provided by ULA.

(5) Segregation of ARRA Funding. In accordance with ARRA requirements, ARRA funding received by ULA under this Agreement shall be tracked and reported separately and shall not be comingled with other funding. These reports will be made publicly available by NASA through posting on a website not later than 30 calendar days after the end of each calendar quarter.

(6) Monthly Technical Progress Reports:

ULA shall also provide monthly technical progress reports no later than the 15th day of each month, covering the previous month. The monthly technical report shall be provided to the NASA Administrative Contact. Progress made shall be estimated and reported in a mutually agreed to quantifiable performance method using milestone reporting, percent complete or some other methodology other than percent hours exhausted or percent cost incurred. The monthly technical progress reports must describe the progress made since the last report, plans forward and shall also describe any difficulties encountered and the corrective action necessary to recover. The final technical progress report provided shall describe not only work complete but also shall document how this activity has reduced the overall risk to ULA's commercial crew space transportation concept and shall also document the way in which lessons learned as the result of these activities being incorporated into the design and manufacturing efforts of ULA commercial crew space transportation concept.

(7) Access to Records: The Comptroller General of the United States, and appropriate Inspector General appointed under section 3 or 8G of the Inspector General Act of 1978, or an authorized representative of either of the foregoing officials shall have access to and the right to examine ULA's records or the records of any contractor/partner of ULA that directly pertain to and involve transactions relating to the funding provided by NASA under this Agreement for a period of three (3) years after the Government makes the final payment under this Agreement. Further, the Comptroller General shall have access to interview any officer or employee of ULA or its contractors/partners regarding such transactions for a period of three (3) years after the Government makes the final payment under this Agreement.

ARTICLE 6. DISSEMINATION OF PUBLIC INFORMATION

A. NASA or ULA may, consistent with Federal law and this Agreement, release general information regarding its participation in this Agreement as desired. ULA agrees that all press releases resulting from activities conducted under this Agreement will be reviewed and concurred on by the NASA JSC Director of Public Affairs prior to release. Such approval will not be unreasonably withheld.

B. ULA agrees the words "National Aeronautics and Space Administration" or the letters "NASA" will not be used in connection with a product or service in a manner reasonably calculated to convey any impression that such product or service has the authorization, support, sponsorship, or endorsement of NASA, which does not, in fact, exist. In addition, ULA agrees that any proposed use of the NASA name or initials shall be submitted by ULA in advance to the NASA Administrative Contact, who will submit the proposed use to the JSC Director of Public Affairs for review and approval. Such approval shall not be unreasonably withheld. Use of NASA emblems/devices (i.e., NASA Seal, NASA Insignia, NASA logotype, NASA Program Identifiers, and the NASA Flag) is governed by 14 C.F.R. Part 1221. ULA agrees that any proposed use of such emblems/devices shall be submitted in advance to the NASA Administrative Contact, who will submit the proposed use the NASA JSC Director of Public Affairs for review and approval in accordance with such regulations.

C. NASA does not endorse or sponsor any commercial product, service, or activity. NASA's participation in this Agreement does not constitute endorsement by NASA. ULA agrees that nothing in this Agreement will be construed to imply that NASA authorizes, supports, endorses, or sponsors any product or service of ULA resulting from activities conducted under this Agreement.

ARTICLE 7. NASA FURNISHED INFORMATION AND SERVICES

A. NASA may, at its sole discretion and on terms to be negotiated between the parties, provide ULA services, technical expertise, or access to Government Property. Such NASA services, technical expertise, or access to Government Property may be provided on either a reimbursable or non-reimbursable basis. Specific services and property and any terms and conditions applicable to the provision of such services, technical expertise and access to Government property will be identified in appropriate appendices to this Agreement. Unless NASA specifically requires ULA to use NASA furnished services, technical expertise, or Government Property to fulfill its obligations under this Agreement, any decision by ULA to use NASA furnished services, technical expertise, or Government Property shall be at ULA's option and sole discretion. ULA 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. ULA has the ability to enter into separate Space Act agreements with NASA Centers to use NASA resources in performance of this Agreement. The terms and conditions of such other

Space Act agreements will govern the use of NASA resources not being provided under this Agreement.

ARTICLE 8. NONEXCLUSIVITY

This Agreement is not exclusive; accordingly, NASA may enter into similar Agreements for the same or similar purpose with other entities.

ARTICLE 9: PARTICIPANT CERTIFICATIONS

Within 10 calendar days of the effective date of this agreement or within 10 calendar days of any change in status under A. through D. below (including the addition of any new contractor/partner), ULA shall certify the following to the NASA Administrative Contact:

A. ULA or any of its contractors/partners are not presently debarred, suspended, proposed for debarment, or otherwise declared ineligible for award of funding by any Federal agency.

B. ULA or any of its contractors/partners have not been convicted nor had a civil judgment rendered against it within the last three (3) years for fraud in obtaining, attempting to obtain, or performing a Government contract.

C. ULA or any of its contractors/partners receiving $100,000 or more in NASA funding for work performed under this Agreement must certify that they have not used any such funds for lobbying purposes prohibited by 31 U.S.C. 1352.

D. ULA is an eligible participant as defined in Section 4.2 of the CCDev Announcement.

ARTICLE 10. PROTECTION OF WHISTLEBLOWERS

A. Pursuant to ARRA, an employee of any non-Federal employer receiving recovery funds may not be discharged, demoted, or otherwise discriminated against as a reprisal for disclosing to the Recovery Accountability and Transparency Board, an inspector general, the Comptroller General, a member of Congress, a State or Federal regulatory or law enforcement agency, a person with supervisory authority over the employee (or such other person working for the employer who has the authority to investigate, discover, or terminate misconduct), a court or grand jury, the head of a Federal agency, or their representatives, information that the employee reasonably believes is evidence of—

(1) gross mismanagement of an agency contract or grant relating to recovery funds;
(2) a gross waste of recovery funds;

(3) a substantial and specific danger to public health or safety related to the implementation or use of recovery funds;
(4) an abuse of authority related to the implementation or use of recovery funds; or
(5) a violation of law, rule, or regulation related to an agency contract (including the competition for or negotiation of a contract) or grant, awarded or issued relating to recovery funds.

B. A person who believes that anyone has been subjected to a reprisal prohibited in Section 10.A. above may submit a complaint regarding the reprisal to the NASA Inspector General's office.

C. ULA shall post notice of the rights and remedies provided for under §1553 of ARRA.

D. Any contractor/partner of ULA that receives ARRA funds from this Agreement shall promptly refer to the NASA Inspector General any credible evidence that a principal, agent, contractor, subcontractor, or other person has committed a criminal or civil violation of laws pertaining to fraud, conflict of interest, bribery, gratuity, or similar misconduct involving ARRA funding received by ULA under this Agreement.

ARTICLE 11. LIABILITY AND RISK OF LOSS

A. ULA hereby waives any claims against NASA, its employees, its related entities, (including, but not limited to, contractors and subcontractors at any tier, grantees, investigators, customers, users, and their contractors and subcontractors, at any tier) and employees of NASA's related entities for any injury to, or death of, ULA employees or the employees of ULA's related entities, or for damage to, or loss of, ULA's property or the 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. ULA further agrees to extend this unilateral waiver to its related entities by requiring them, by contract or otherwise, to waive all claims against NASA, its related entities, and employees of NASA and employees of NASA's related entities for injury, death, damage, or loss arising from or related to activities conducted under this Agreement.

ARTICLE 12. LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS

ULA or its contractors/partners shall not use any funds provided under this Agreement to pay 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 in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering

into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.

ARTICLE 13. INTELLECTUAL PROPERTY AND DATA RIGHTS - RIGHTS IN DATA

A. General

(1) "Related Entity" as used in this Article, means a contractor, subcontractor, grantee, or other entity having a legal relationship with NASA or ULA that is assigned, tasked, or contracted with to perform specified NASA or ULA activities under this Agreement.

(2) "Data," as used in this Agreement, means recorded information, regardless of form, the media on which it may be recorded, or the method of recording. The term includes, but is not limited to, data of a scientific or technical nature, software and documentation thereof, and data comprising commercial and financial information.

(3) "Proprietary Data," as used in this Article, means Data embodying trade secrets or comprising commercial or financial information that is privileged or confidential.

(4) The Data rights set forth herein are applicable to employees of ULA and employees of any Related Entity of ULA. ULA shall ensure that its employees and employees of any Related Entity that perform ULA activities under this Agreement are aware of the obligations under this Article and that all such employees are bound to such obligations.

(5) Data exchanged between NASA and ULA under this Agreement will be exchanged without restriction as to its disclosure, use, or duplication except as otherwise provided in this Article.

(6) No preexisting Proprietary Data will be exchanged between the Parties under this Agreement unless specifically authorized in this Article or in writing by the owner of the Proprietary Data.

(7) In the event that Data exchanged between NASA and ULA include a restrictive notice that NASA or ULA deems to be ambiguous or unauthorized, NASA or ULA may inform the other Party of such condition. Notwithstanding such a notice, as long as such notice provides an indication that a restriction on use or disclosure was intended, the Party receiving such Data will treat the Data pursuant to the requirements of this clause unless otherwise directed in writing by the party providing such Data.

(8) Notwithstanding any restriction on use, disclosure, or reproduction of Data provided in this clause, the Parties will not be restricted in the use, disclosure, or reproduction of Data provided under this Agreement that: (a) is publicly available at the time of disclosure or thereafter becomes publicly available without breach of this Agreement; (b) is known to, in the possession of, or developed by the receiving Party independent of carrying out the receiving Party's responsibilities under this Agreement and independent of any disclosure of, or without reference to, Proprietary Data or otherwise protectable Data hereunder; (c) is received from a third party having the right to disclose such information without restriction; or (d) is required to be produced or released by the receiving Party pursuant to a court order or other legal requirement.

(9) If either NASA or ULA believes that any of the events or conditions that remove restriction on the use, disclosure, or reproduction of the Data apply, NASA or ULA will promptly

notify the other Party of such belief prior to acting on such belief, and, in any event, will notify the other Party prior to an unrestricted use, disclosure, or reproduction of such Data.

(10) Disclaimer of Liability: Notwithstanding any restriction on use, disclosure, or reproduction of Data provided in this Article, NASA will not be restricted in, nor incur any liability for, the use, disclosure, or reproduction of any Data not identified with a suitable restrictive notice in accordance with paragraphs B and G of this Article or of any Data included in Data which ULA has furnished, or is required to furnish to the U.S. Government without restriction on disclosure and use.

(11) ULA may use the following, or a similar, restrictive notice as required by paragraphs B and G of this Article. In addition to identifying Proprietary Data with such a restrictive notice, ULA should mark each page containing Proprietary Data with the following, or a similar, legend: "PROPRIETARY DATA – use and disclose only in accordance with notice on title or cover page."

Proprietary Data Notice
These data herein include <enter as applicable: "Background Data" or "Data Produced by ULA under a Space Act Agreement"> in accordance with the Data Rights provisions under Space Act Agreement <provide applicable identifying information> and embody Proprietary Data. In accordance with the Space Act Agreement, NASA will use reasonable efforts to maintain the data in confidence and limit use, disclosure, and reproduction by NASA and any Related Entity of NASA (under suitable protective conditions) in accordance with restrictions identified in the Space Act Agreement <may list specific restrictions listed in the Agreement>.

B. Data First Produced by ULA under this Agreement

(1) Data first produced by ULA in carrying out ULA's responsibilities under this Agreement, including but not limited to technical data related to inventions made under this Agreement, will be furnished to NASA upon request and such Data will be disclosed and used by NASA and any Related Entity of NASA (under suitable protective conditions) during the term of this Agreement only for evaluating ULA's performance under this Agreement. If ULA considers any such Data to be Proprietary Data, and such Data is identified with a suitable restrictive notice, NASA will use reasonable efforts to maintain the Data in confidence.

(2) Upon a successful completion by ULA of all milestones under this Agreement, NASA shall not assert rights in such Data or use such Data for any purpose except that NASA shall retain the right to: (1) maintain a copy of such Data for archival purposes; and (2) use or disclose such archived Data by or on behalf of NASA for Government purposes in the event the NASA determines that

(a) Such action is necessary because ULA, its assignee, or other successor has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of inventions, hardware, or software related to such Data;

(b) Such action is necessary because ULA, its assignee, or other successor, having achieved practical application of inventions, hardware, or software related to such Data, has failed to maintain practical application;

(c) Such action is necessary because ULA, its assignee, or other successor has discontinued making the benefits of inventions, hardware, or software related to such Data available to the public or to the Federal Government;

(d) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by ULA, its assignee, or other successor; or

(e) Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by ULA, its assignee, or successor.

In the event NASA determines that one of the circumstances listed in subparagraphs (a)–(e) above exists, NASA shall provide written notification to the ULA Administrative Point of Contact. Upon mailing of such determination, ULA shall have thirty (30) days to respond by providing its objection to the determination as a dispute under the Article entitled "Dispute Resolution" of this Agreement. In the event that ULA does not respond in writing to NASA's determination, then such determination shall serve as a final agency decision for all purposes including judicial review.

(3) In the event NASA terminates this Agreement in accordance with Article 17.B., Termination for Failure to Perform, NASA shall have the right to use, reproduce, prepare derivative works, distribute to the public, perform publicly, display publicly, or disclose Data first produced by ULA in carrying out ULA's responsibilities under this Agreement by or on behalf of NASA for Government purposes.

(4) The parties will negotiate rights in Data in the event of termination for any other reason.

C. Data First Produced by NASA under this Agreement

(1) As to Data first produced by NASA (or any Related Entity of NASA) in carrying out NASA responsibilities under this Agreement that would be Proprietary Data if it had been obtained from ULA, such Data will be appropriately marked with a restrictive notice and maintained in confidence for the duration of this Agreement, with the express understanding that during the aforesaid restricted period such marked Data may be disclosed and used by NASA and any Related Entity of NASA (under suitable protective conditions) only for carrying out NASA responsibilities under this Agreement.

(2) Upon a successful completion by ULA of all milestones under this Agreement, NASA shall not use such Data for any purpose except that NASA shall retain the right to: (1) maintain and reproduce copies of such Data for archival purposes; and (2) use or disclose such archived Data by or behalf of the NASA for Government purposes in the event the NASA determines that

(a) Such action is necessary because ULA, its assignee, or other successor has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of inventions, hardware, or software related to such Data;

(b) Such action is necessary because ULA, its assignee, or other successor, having achieved practical application of inventions, hardware, or software related to such Data, has failed to maintain practical application;

(c) Such action is necessary because ULA, its assignee, or other successor has discontinued making the benefits of inventions, hardware, or software related to such Data available to the public or to the Federal Government;

(d) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by ULA, its assignee, or other successor; or

(e) Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by ULA, its assignee, or successor.

In the event NASA determines that one of the circumstances listed in subparagraphs (a)–(e) above exists, NASA shall provide written notification to the ULA Administrative Point of Contact. Upon mailing of such determination, ULA shall have thirty (30) days to respond by providing its objection to the determination as a dispute under the Article entitled "Dispute Resolution" of this Agreement. In the event that ULA does not respond in writing to NASA's determination, then such determination shall serve as a final agency decision for all purposes including judicial review.

(3) In the event NASA terminates this Agreement in accordance with Article 17.B., Termination for Failure to Perform, NASA shall have the right to use, reproduce, prepare derivative works, distribute to the public, perform publicly, display publicly, or disclose Data first produced by NASA in carrying out NASA's responsibilities under this Agreement by or on behalf of NASA for Government purposes.

(4) The parties will negotiate rights in Data in the event of termination for any other reason.

D. Publication of Results

(1) Recognizing that section 203 of the National Aeronautics and Space Act of 1958 (42 U.S.C. § 2473), as amended, requires NASA to provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof, and that the dissemination of the results of NASA activities is one of the considerations for this Agreement, NASA will coordinate proposed publication of results with ULA in a manner that allows ULA a reasonable amount of time to review and comment on proposed publications.

(2) Consistent with other obligations in this Article, NASA agrees that it will not publish any results without first receiving permission from ULA.

E. Data Disclosing an Invention

In the event Data exchanged between NASA and ULA discloses an invention for which patent protection is being considered, the furnishing party specifically identifies such Data, and the disclosure and use of such Data is not otherwise limited or restricted herein, the receiving party agrees to withhold such Data from public disclosure for a reasonable time (presumed to be 1 year unless mutually agreed otherwise) in order for patent protection to be obtained.

F. Data Subject to Export Control

Technical data, whether or not specifically identified or marked, that is subject to the export laws and regulations of the United States and that is provided to ULA under this Agreement will be treated as such, and will not be further provided to any foreign persons or transmitted outside the United States without proper U.S. Government authorization, where required.

G. Background Data

(1) In the event ULA furnishes NASA with Data developed at private expense that existed prior to, or was produced outside of, this Agreement, and such Data embody Proprietary Data, and such Data is so identified with a suitable restrictive notice, NASA will use reasonable efforts to maintain the Data in confidence and such Data will be disclosed and used by NASA and any Related Entity of NASA (under suitable protective conditions) only for evaluating ULA's performance under this Agreement. Upon completion of activities under this Agreement, such Data will be disposed of as requested by ULA.

(2) At the time of execution of this Agreement, the Parties agree that the following Background Data embodies Proprietary Data that will be provided to NASA: Not Applicable

H. Handling of Data

(1) In the performance of this Agreement, ULA and any Related Entity of ULA may have access to, be furnished with, or use the following categories of Data:

(a) Proprietary Data of third parties that the U.S. Government has agreed to handle under protective arrangements; and/or

(b) U.S. Government Data, the use and dissemination of which, the U.S. Government intends to control.

(2) Data provided by the U.S. Government under the Agreement

(a) The Parties agree that, during the term of this Agreement, ULA may request from NASA, and NASA may provide, Proprietary Data of third parties, with the express understanding that ULA will use and protect such Data in accordance with this Article.

(b) The Parties agree that, during the term of this Agreement, ULA may request from NASA, and NASA may provide, U.S. Government Data, with the express understanding that ULA will use and protect such U.S. Government Data in accordance with this Article.

(c) At the time of execution of this Agreement, the Parties agree that the following software and related Data will be provided to ULA under a separate Software Usage Agreement with the express understanding that ULA will use and protect such related Data in accordance with this Article: <insert name and NASA Case No. of the software; if none, insert "None" or "Not Applicable >. Unless ULA has entered into a license, consistent with 37 C.F.R. Part 404, for software provided under this Agreement, upon completion of activities under this Agreement, such related Data will be disposed of as instructed by NASA. Note: From time to time during the term of this Agreement, ULA may request from NASA, and NASA may provide, such software and related data.

(3) With respect to such Data specifically identified in this Agreement or specifically marked with a restrictive notice, ULA agrees to:

(a) Use, disclose, or reproduce such Data only to the extent necessary to perform the work required under this Agreement;

(b) Safeguard such Data from unauthorized use and disclosure;

(c) Allow access to such Data only to its employees and any Related Entity that require access for their performance under this Agreement;

(d) Except as otherwise indicated in (3)(c) above, preclude access and disclosure of such Data outside ULA's organization;

(e) Notify its employees who may require access to such Data about the obligations under this Article, and ensure any Related Entity performs the same functions with respect to its employees; and

(f) Return or dispose of such Data, as NASA may direct, when the Data is no longer needed for performance under this Agreement.

I. Oral and visual information

If information that ULA considers to be Proprietary Data is disclosed orally or visually to NASA, NASA will have no duty to limit or restrict, and will not incur any liability for, any disclosure or use of such information unless (1) ULA orally informs NASA before initial disclosure that such information is considered to be Proprietary Data, and (2) ULA reduces such information to tangible, recorded form that is identified and marked with a suitable restrictive notice as required by paragraphs B and G above and furnishes the resulting Data to NASA within 10 calendar days after such oral or visual disclosure.

ARTICLE 14. INTELLECTUAL PROPERTY AND DATA RIGHTS - INVENTION AND PATENT RIGHTS

A. Definitions

(1) "Administrator," as used in this Article, means the Administrator of the National Aeronautics and Space Administration (NASA) or duly authorized representative.

(2) "Patent Representative" as used in this Article means the NASA Johnson Space Center Patent Counsel. Correspondence with the Patent Representative under this clause will be sent to the address below:

Patent Counsel
NASA Johnson Space Center
Mail Code AL
2101 NASA Parkway
Houston, TX 77058

(3) "Invention," as used in this Agreement, means any innovation or discovery that is or may be patentable or otherwise protectable under title 35 of the U.S.C.

(4) "Made," as used in relation to any invention, means the conception or first actual reduction to practice of such invention.

(5) "Practical application," as used in this Agreement, means to manufacture, in the case of a composition or product; to practice, in the case of a process or method; or to operate, in case of a machine or system; and, in each case, under such conditions as to establish that the invention, hardware, software, or related Data is being utilized and that its benefits are, to the extent permitted by law or Government regulations, available to the public or to the Federal Government on reasonable terms.

(6) "Related Entity" as used in this Article, means a contractor, subcontractor, grantee, or other entity having a legal relationship with NASA or ULA that is assigned, tasked, or contracted with to perform specified NASA or ULA activities under this Agreement.

B. Allocation of principal rights

(1) Presumption of title

(a) Any invention made under this Agreement shall be presumed to have been made in the manner specified in paragraph (1) or (2) of section 305(a) (42 U.S.C. § 2457(a)) of the National Aeronautics and Space Act of 1958 (hereinafter called "the Act"), and the above presumption shall be conclusive unless at the time of reporting such invention ULA submits to the Patent Representative a written statement, containing supporting details, demonstrating that the invention was not made in the manner specified in paragraph (1) or (2) of section 305(a) of the Act.

(b) Regardless of whether title to such an invention would otherwise be subject to an advance waiver or is the subject of a petition for waiver as described in paragraph B.(3) and paragraph I, ULA may nevertheless file the statement described in paragraph B.(1)(a) of this Article. The Administrator (or his designee) will review the information furnished by ULA in any such statement and any other available information relating to the circumstances surrounding the making of the invention and will notify ULA whether the Administrator has determined that the invention was made in the manner specified in paragraph (1) or (2) of section 305(a) of the Act.

(2) Property rights in inventions. Each invention made under this Agreement for which the presumption of paragraph B.(1)(a) of this clause is conclusive or for which there has been a determination that it was made in the manner specified in paragraph (1) or (2) of section 305(a) of the Act shall be the exclusive property of the United States as represented by the Administrator of NASA unless the Administrator waives all or any part of the rights of the United States to ULA's invention, as provided in paragraph B.(3) of this clause.

(3) Waiver of rights.

(a) The NASA Patent Waiver Regulations, 14 C.F.R. Part 1245, Subpart 1, have adopted the Presidential Memorandum on Government Patent Policy of February 18, 1983, as a guide in acting on petitions (requests) for waiver of rights to any invention or class of inventions made or that may be made in the manner specified in paragraph (1) or (2) of Section 305(a) of the Act.

(b) NASA has determined that to stimulate and support the capability of a United States commercial provider to provide commercial crew space transportation services to the public and the Federal Government, the interest of the United States would be served by waiving to ULA, in accordance with provisions of 14 C.F.R. Part 1245, Subpart 1, rights to

inventions made by ULA in the performance of work under this Agreement. Therefore, upon petition submitted by ULA, as provided in 14 C.F.R. Part 1245, Subpart 1, either prior to execution of the Agreement or within 30 calendar days after execution of the Agreement, for advance waiver of rights to any or all of the inventions that may be made under this Agreement, NASA will waive such rights to ULA. If such a petition is not submitted, ULA may petition for waiver of rights to an identified invention within eight months of first disclosure of invention in accordance with paragraph E.(2) of this clause or within such longer period as may be authorized in accordance with 14 CFR 1245.105. Further procedures are provided in paragraph I of this clause.

C. Minimum rights reserved by the Government

(1) With respect to each ULA invention made under this Agreement for which a waiver of rights is applicable in accordance with 14 C.F.R. Part 1245, Subpart 1, the Government reserves:

(a) An irrevocable, royalty-free license for the practice of such invention throughout the world by or on behalf of the United States or any foreign government in accordance with any treaty or agreement with the United States; and

(b) Such other March-in rights as given in Paragraph H below.

(2) NASA will not exercise the government purpose license reserved in paragraph C.(1)(a) during the term of this Agreement.

(3) Upon a successful completion by ULA of all milestones under this Agreement, NASA will refrain from exercising the government purpose license reserved in paragraph C.(1)(a) for a period of five (5) years following the expiration of this Agreement or until December 31, 2015, whichever is later.

(4) Nothing contained in this paragraph shall be considered to grant to the Government any rights with respect to any invention other than an invention made under this Agreement.

D. Minimum rights to ULA

(1) ULA is hereby granted a revocable, nonexclusive, royalty-free license in each patent application filed in any country on an invention made by ULA under this Agreement and any resulting patent in which the Government acquires title, unless ULA fails to disclose such invention within the times specified in paragraph E.(2) of this clause. ULA's license extends to its domestic subsidiaries and affiliates, if any, within the corporate structure of which ULA is a party and includes the right to grant sublicenses of the same scope to the extent ULA was legally obligated to do so at the time the Agreement was awarded. The license is transferable only with the approval of the Administrator except when transferred to the successor of that part of ULA's business to which the invention pertains.

(2) ULA's domestic license may be revoked or modified by the Administrator to the extent necessary to achieve expeditious practical application of such invention pursuant to an application for an exclusive license submitted in accordance with 37 C.F.R. Part 404, Licensing of Government Owned Inventions. This license will not be revoked in that field of use or the

geographical areas in which ULA has achieved practical application and continues to make the benefits of the invention reasonably accessible to the public. The license in any foreign country may be revoked or modified at the discretion of the Administrator to the extent ULA, its licensees, or its domestic subsidiaries or affiliates have failed to achieve practical application in that foreign country.

(3) Before revocation or modification of the license, ULA will be provided a written notice of the Administrator's intention to revoke or modify the license, and ULA will be allowed 30 calendar days (or such other time as may be authorized by the Administrator for good cause shown by ULA) after the notice to show cause why the license should not be revoked or modified. ULA has the right to appeal, in accordance with 14 C.F.R. 1245.112, any decision concerning the revocation or modification of its license.

E. Invention identification, disclosures, and reports

(1) ULA shall establish and maintain active and effective procedures to assure that inventions made under this Agreement are promptly identified and disclosed to ULA personnel responsible for the administration of this clause within six months of conception and/or first actual reduction to practice, whichever occurs first in the performance of work under this Agreement. These procedures shall include the maintenance of laboratory notebooks or equivalent records and other records as are reasonably necessary to document the conception and/or the first actual reduction to practice of such inventions, and records that show that the procedures for identifying and disclosing such inventions are followed. Upon request, ULA shall furnish the Patent Representative a description of such procedures for evaluation and for determination as to their effectiveness.

(2) ULA will disclose each such invention to the Patent Representative within two months after the inventor discloses it in writing to ULA personnel responsible for the administration of this clause or, if earlier, within six months after ULA becomes aware that such an invention has been made, but in any event before any on sale, public use, or publication of such invention known to ULA. ULA shall use the NASA electronic New Technology Reporting system (eNTRe), accessible at http://invention.nasa.gov, to disclose inventions. The invention disclosure shall identify this Agreement and shall be sufficiently complete in technical detail to convey a clear understanding, to the extent known at the time of the disclosure, of the nature, purpose, operation, and physical, chemical, biological, or electrical characteristics of the invention. The disclosure shall also identify any publication, on sale, or public use of any such invention and whether a manuscript describing such invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. In addition, after disclosure to NASA, ULA will promptly notify NASA of the acceptance of any manuscript describing such an invention for publication or of any on sale or public use planned by ULA for such invention.

(3) ULA shall furnish the Patent Representative the following:

(a) Interim reports every 12 months (or such longer period as may be specified by the Patent Representative) from the date of the Agreement, listing inventions made under this Agreement during that period, and certifying that all such inventions have been disclosed (or

that there are no such inventions) and that the procedures required by paragraph E.(2) of this clause have been followed.

(b) A final report, within three months after completion of the work, listing all inventions made under this Agreement or certifying that there were no such inventions, and listing all subcontracts or other agreements with a Related Entity containing a patent and invention rights clause (as required under paragraph G of this clause) or certifying that there were no such subcontracts or other agreements.

(c) Interim and final reports shall be submitted electronically at the eNTRe Web-site http://invention.nasa.gov.

(4) ULA agrees, upon written request of the Patent Representative, to furnish additional technical and other information available to ULA as is necessary for the preparation of a patent application on an invention made under this Agreement in which the Government retains title and for the prosecution of the patent application, and to execute all papers necessary to file patent applications on such inventions and to establish the Government's rights in the inventions.

(5) Protection of reported inventions. When inventions made under this Agreement are reported and disclosed to NASA in accordance with the provisions of this Article, NASA agrees to withhold such reports or disclosures from public access for a reasonable time (presumed to be 1 year unless otherwise mutually agreed) in order to facilitate the allocation and establishment of the invention and patent rights under these provisions.

F. Examination of records relating to inventions

(1) The Patent Representative or designee shall have the right to examine any books (including laboratory notebooks), records, and documents of ULA relating to the conception or first actual reduction to practice of inventions in the same field of technology as the work under this Agreement to determine whether

(a) Any such inventions were made in performance of this Agreement;

(b) ULA has established and maintained the procedures required by paragraph E.(1) of this clause; and

(c) ULA and its inventors have complied with the procedures.

(2) If the Patent Representative learns of an unreported ULA invention that the Patent Representative believes may have been made under this Agreement, ULA may be required to disclose the invention to NASA for a determination of ownership rights.

(3) Any examination of records under this paragraph will be subject to appropriate conditions to protect the confidentiality of the information involved.

G. Subcontracts or Other Agreements

(1)(a) Unless otherwise authorized or directed by the Patent Representative, ULA shall include this Invention and Patent Rights Article (suitably modified to identify the parties) in any subcontract or other agreement with a Related Entity hereunder (regardless of tier) for the performance of experimental, developmental, or research work.

(b) In the Invention and Patent Rights Article included in any such subcontract or other agreement, the following (suitably modified to identify the parties) shall be substituted for paragraph B(3)(b):

As provided in 14 C.F.R. Part 1245, Subpart 1, (insert name of related entity) may petition, either prior to execution of the Agreement or within 30 calendar days after execution of the Agreement, for advance waiver of rights to any or all of the inventions that may be made under this Agreement. If such a petition is not submitted, or if after submission it is denied, (insert name of related entity) may petition for waiver of rights to an identified invention within eight months of first disclosure of invention in accordance with paragraph E.(2) of this Article or within such longer period as may be authorized in accordance with 14 CFR 1245.105. Further procedures are provided in paragraph H of this Article.

(c) In the case of subcontracts or other agreements at any tier, NASA, the Related Entity, and ULA agree that the mutual obligations of the parties created by this Article constitute privity of contract between the Related Entity and NASA with respect to those matters covered by this Article.

(2) In the event of a refusal by a prospective Related Entity to accept such a clause, ULA:

(a) Shall promptly submit a written notice to the Patent Representative setting forth the prospective Related Entity's reasons for such refusal and other pertinent information that may expedite disposition of the matter; and

(b) Shall not proceed with such subcontract or other agreement without the written authorization of the Patent Representative.

(3) ULA shall promptly notify the Patent Representative in writing upon the award of any subcontract or other agreement with a Related Entity (at any tier) containing an invention and patent rights clause by identifying the Related Entity, the applicable invention and patent rights clause, the work to be performed under the subcontract or other agreement, and the dates of award and estimated completion. Upon request of the Patent Representative, ULA shall furnish a copy of such subcontract or other agreement, and, no more frequently than annually, a listing of the subcontracts or other agreements that have been awarded.

(4) In recognition of ULA's substantial contribution of funds, facilities and/or equipment to the work performed under this Agreement, ULA is authorized, subject to the rights of NASA set forth elsewhere in this Article, to:

(a) Acquire by negotiation and mutual agreement rights to an invention made under this Agreement by a Related Entity as ULA may deem necessary to obtaining and maintaining of private support; and

(b) Request, in the event of an inability to reach agreement pursuant to paragraph G. (4)(a) of this Article, that NASA request that such rights for ULA be included as an additional reservation in a waiver granted pursuant to 14 CFR Part 1245, Subpart 1. Any such requests to NASA should be prepared in consideration of the following guidance and submitted to the Patent Representative. Notwithstanding paragraph B.(3)(b) of this Article, the Related Entity should be advised that unless it requests a waiver of title pursuant to the NASA Patent Waiver Regulations (14 C.F.R. Part 1245, Subpart 1), NASA will acquire title to inventions made

under this Agreement. If a waiver is not requested or granted, ULA may request a license from NASA consistent with the requirements of 37 CFR Part 404. A Related Entity requesting a waiver must follow the procedures set forth in paragraph I of this Article.

H. March-in rights

(1) ULA agrees that, with respect to any invention made under this Agreement in which it has acquired title, NASA has the right in accordance with the procedures in 37 CFR 401.6 and any supplemental regulations of the agency to require ULA, or an assignee or exclusive licensee of such an invention, to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if ULA, its assignee, or exclusive licensee refuses such a request NASA has the right to grant such a license itself if the Federal agency determines that

(a) Such action is necessary because ULA, assignee, or exclusive licensee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of such invention in such field of use;

(b) Such action is necessary because ULA, assignee, or exclusive licensee, having achieved practical application of such invention, has failed to maintain practical application of such invention in such field of use;

(c) Such action is necessary because ULA, assignee, or exclusive licensee has discontinued making the benefits of such invention available to the public or to the Federal Government;

(d) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by ULA, assignee, or exclusive licensee; or

(e) Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by ULA, assignee, or exclusive licensee.

I. Requests for Waiver of Rights

(1) In accordance with the NASA Patent Waiver Regulations, 14 C.F.R. Part 1245, Subpart 1, waiver of rights to any or all inventions made or that may be made under this Agreement may be requested at different time periods. Advance waiver of rights to any or all such inventions may be requested prior to the execution of the Agreement, or within 30 calendar days after execution thereof. In addition, waiver of rights to an identified invention made and reported under this Agreement may be requested, even though a request for an advance waiver was not previously requested or, if previously requested, was not granted.

(2) Each request for waiver of rights shall be by petition to the Administrator and shall include an identification of the petitioner; place of business and address; if petitioner is represented by counsel, the name, address, and telephone number of the counsel; the signature of the petitioner or authorized representative; and the date of signature. No specific forms need be used, but the request should contain a positive statement that waiver of rights is being requested under the NASA Patent Waiver Regulations; a clear indication of whether the request is for an advance waiver or for a waiver of rights for an individual identified

invention; whether foreign rights are also requested and, if so, for which countries, and a citation of the specific section(s) of the regulations under which such rights are requested; and the name, address, and telephone number of the party with whom to communicate when the request is acted upon.

(3) All petitions for waiver, whether advanced or individual petitions, will be submitted to the Patent Representative designated in this Article.

(4) A Petition submitted in advance of this Agreement will be forwarded by the Patent Representative to the Inventions and Contributions Board. The Board will consider the petition and where the Board makes the findings to support the waiver, the Board will recommend to the Administrator that waiver be granted, and will notify the petitioner and the Patent Representative of the Administrator's determination. The Patent Representative will be informed by the Board whenever there is insufficient time or information to permit a decision to be made on an advance waiver without unduly delaying the execution of the Agreement. In the event a request for an advance waiver is not granted or is not decided upon before execution of the Agreement, the petitioner will be so notified by the Patent Representative. All other petitions will be processed by the Patent Representative and forwarded to the Board. The Board shall notify the petitioner of its action and if waiver is granted, the conditions, reservations, and obligations thereof will be included in the Instrument of Waiver. Whenever the Board notifies a petitioner of a recommendation adverse to, or different from, the waiver requested, the petitioner may request reconsideration under procedures set forth in the NASA Patent Waiver Regulations.

ARTICLE 15. DISCLAIMER OF WARRANTY

Goods (e.g., equipment, facilities, technical information, data, and prototypes) and services, if provided by NASA under this Agreement, are provided "as is" and no warranty related to availability, title, or suitability for any particular use, nor any implied warranty of merchantability or fitness for a particular purpose, is provided under this Agreement. NASA makes no express or implied warranty as to any intellectual property, generated information, or product made or developed under this Agreement, or that the goods, services, materials, products, processes, information, or data to be furnished hereunder will accomplish intended results or are safe for any purpose including the intended purpose. Neither NASA nor its contractors shall be liable for special, consequential, indirect, or incidental damages attributed to such goods, services, materials, products, processes, information, or data furnished under this Agreement.

ARTICLE 16. TERM OF AGREEMENT

This Agreement becomes effective upon the date of the last signature below and shall expire on December 31, 2010.

ARTICLE 17. TERMINATION

A. Termination by Mutual Consent.

This Agreement may be terminated at any time upon mutual written consent of both parties.

B. Termination for Failure to Perform.

(1) At its discretion, NASA may terminate this Agreement 30 calendar days after issuance of a written notification that ULA has failed to perform under this Agreement, including failure to meet a scheduled milestone as identified and described in Appendix 2 or failure to meet the objectives of the American Recovery and Reinvestment Act. Before making such a notification, NASA will consult with ULA to ascertain the cause of the failure and determine whether additional efforts are in the best interest of the parties. Upon such a notification and determination, NASA will take all rights identified in Articles 13 and 14 of this Agreement.

(2) ULA will not be entitled to any additional payments from the Government due to a termination for failure to meet a milestone. NASA and ULA will negotiate in good faith any other outstanding issues between the parties. Failure of the parties to agree will be resolved pursuant to Article 19, Dispute Resolution.

C. Unilateral Termination by NASA.

(1) NASA may terminate this Agreement upon written notice. NASA's obligations under this Agreement may be terminated, in whole or in part, (a) upon a declaration of war by the Congress of the United States; or (b) upon a declaration of a national emergency by the President of the United States; or (c) upon a NASA determination, in writing, that NASA is required to terminate for reasons beyond its control. For purposes of this Article, reasons beyond NASA's control include, but are not limited to, acts of God or of the public enemy, acts of the U.S. Government other than NASA, in either its sovereign or contractual capacity (to include failure of Congress to appropriate sufficient funding), fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, or unusually severe weather.

(2) Upon receipt of written notification that the Government is unilaterally terminating this Agreement, ULA shall immediately stop work under this Agreement and shall immediately cause any and all of its partners and suppliers to cease work, except to the extent that ULA wishes to pursue the activities defined in Appendix 2 exclusively using its own funding. Upon such a termination, NASA and ULA agree to negotiate in good faith a final settlement payment to be made by NASA. However, in no instance shall NASA's liability for termination exceed the total amount due under the next milestone of this Agreement. Any such payment shall be subject to the provisions of Article 5. Failure of the parties to agree will be resolved pursuant to Article 19, Dispute Resolution.

D. Limitation on Damages.

In the event of any termination by NASA, neither NASA nor ULA shall be liable for any loss of profits, revenue, or any indirect or consequential damages incurred by the other Party, its contractors, subcontractors, or customers as a result of any termination of this Agreement. A

Party's liability for any damages under this Agreement is limited solely to direct damages, incurred by the other Party, as a result of any termination of this Agreement subject to mitigation of such damages by the complaining party. However, in no instance shall NASA's liability for termination exceed the total amount due under the next milestone under this Agreement.

E. Rights in Property.

ULA will have title to property acquired or developed by ULA and its contractors/partners with funding provided under this Agreement, in whole or in part to conduct the activities defined in Appendix 2.

ARTICLE 18. CONTINUING OBLIGATIONS

The obligations of the parties set forth in the provisions of Articles 11 (Liability and Risk of Loss) and 13-14 (Intellectual Property and Data Rights) of this Agreement and such other rights and obligations which by their terms continue past the expiration or termination of this Agreement shall so continue to apply.

ARTICLE 19. DISPUTE RESOLUTION

All disputes concerning questions of fact or law arising under this Agreement shall be referred by the claimant in writing to the ULA Administrative Contact and the NASA Administrative Contact, who shall seek to resolve such disputes by mutual agreement. If they are unable to resolve the dispute, then the dispute will be referred to the JSC Commercial Crew Cargo Project Manager and the CEO of ULA for joint resolution. If the parties are still unable to resolve the dispute, the Associate Administrator for Exploration Systems Mission Directorate, or the Deputy of the Directorate, will seek to resolve the dispute, and if necessary issue a written decision that shall be a final Agency decision for all purposes including judicial review.

Pending resolution of any disputes pursuant to this Article, the Parties agree that performance of all obligations shall be pursued diligently in accordance with the direction of the JSC Commercial Crew Cargo Project Manager.

The Parties agree that this Disputes Resolution procedure shall be the exclusive procedure followed by the Parties in resolving any dispute arising under, or based on, an express or implied provision of this Agreement, including an alleged breach, with the exception for any allegation of reprisal raised under Article 10 of this Agreement. In those cases, the rights and remedies provided for in §1553 of ARRA govern.

ARTICLE 20. PRINCIPAL POINTS OF CONTACT

The following personnel are designated as the Administrative and Technical Contacts between the parties in the performance of this Agreement.

NASA Administrative Contact

Timothy Boyes, Agreements Officer
Johnson Space Center
Mail Code: BT
2101 NASA Parkway
Houston, TX 77058
Phone: 281-483-1838
Fax: 281-483-0503
E-mail: timothy.a.boyes@nasa.gov

ULA Administrative Contact

[redacted]

NASA Technical Contact

Valin Thorn
Deputy Manager, Commercial Crew & Cargo Program
Johnson Space Center
Mail Stop: QA
2101 NASA Parkway
Houston, TX 77058
Phone: 281-244-7097
Fax: 281-483-5970
E-mail: valin.b.thorn@nasa.gov

ULA Technical Contact

[redacted]

ARTICLE 21. MODIFICATION/AMENDMENTS

All modifications and amendments to this Agreement shall be by mutual agreement of the Parties and shall be executed, in writing, and signed by the signatories to this Agreement, or their respective successor or designee.

ARTICLE 22. ASSIGNMENT OF RIGHTS

Neither this Agreement nor any interest arising under it will be assigned by either Party without the express written consent of the other Party.

ARTICLE 23. ANTI-DEFICIENCY ACT

All activities under or pursuant to this Agreement are subject to the availability of appropriated funds, and no provision shall be interpreted to require obligation or provision of funds in violation of the Anti-Deficiency Act, 31 U.S.C. 1341.

ARTICLE 24. APPLICABLE LAW

U.S. Federal law governs this Agreement for all purposes, including, but not limited to, determining the validity of this Agreement, the meaning of its provisions, and the rights, obligations and remedies of the Parties.

If any portion of this Agreement is held invalid by a court of competent jurisdiction, the Parties agree that such invalidity shall not affect the validity of the remaining portions of this Agreement, unless applying such remaining portions would frustrate the purpose of this Agreement.

ARTICLE 25. EXPORT LICENSES

ULA will be responsible for:

A. Compliance with all U.S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, in the performance of this Agreement. In the absence of available license exemptions/exceptions, ULA will be responsible for obtaining the appropriate licenses or other approvals, if required, for exports of hardware, technical data, and software, or for the provision of technical assistance.

B. Obtaining export licenses, if required, before utilizing foreign persons in the performance of this Agreement, including instances where CCDev efforts are to be performed on-site at NASA Centers, where the foreign person will have access to export-controlled technical data or software.

C. All regulatory record keeping requirements associated with the use of licenses and license exemptions/exceptions.

D. Ensuring that the provisions of this Article apply to its contractors/partners.

In the event that either Party intends to utilize a foreign person (as defined in the ITAR and the EAR) in the performance of this Agreement, such Party shall be responsible for obtaining the required export licenses in advance of the foreign person's participation.

ARTICLE 26. LIMITATIONS ON ACTIVITIES WITH RUSSIAN ENTITIES FOR GOODS OR SERVICES

A. ULA shall not provide ARRA funding received under this Agreement in connection with any transaction to purchase goods or services with Russian entities without first receiving written approval from the NASA Administrative Contact. In order to obtain this written approval to engage in such transactions with any Russian entity, ULA shall provide the NASA Administrative Contact with the following information related to each planned transaction:

(1) A detailed description of the Russian entity, including its name, address, and a point of contact, as well as a detailed description of the proposed transaction including the specific purpose of payments that will made under the transaction.

(2) ULA shall provide certification that the Russian entity is not on any of the denied parties, specially designated nationals and entities of concern, lists found at:

BIS's Listing of Entities of Concern: http://www.access.gpo.gov/bis/ear/pdf/744spir.pdf

BIS's List of Denied Parties: http://www.bis.doc.gov/dpl/default.shtm

OFAC's List of Specially Designated Nationals:
http://www.ustreas.gov/offices/enforcement/ofac/sdn/

List of Unverified Persons in Foreign Countries:
http://www.bis.doc.gov/enforcement/unverifiedlist/unverified_parties.html

State Department's List of Parties Statutorily Debarred for Arm Export Control Act Convictions: http://www.pmddtc.state.gov/compliance/debar.html

State Department's List of Proliferating Entities:
http://www.state.gov/t/isn/c15231.htm

B. Unless otherwise agreed by the NASA Administrative Contact, the information necessary to seek approval to enter into any transaction shall be provided to the NASA Administrative Contact 30 calendar days prior to entering into such transaction with any Russian entities.

C. After receiving approval to enter into a requested transaction, ULA shall provide the NASA Administrative Contact with a report not later than 10 calendar days after the end of each calendar quarter which documents the individual payments made to such Russian entity. Such report shall meet the requirements of and include the information required under Article 5, Section (4), Financial Records and Reports.

D. For the purpose of this Article 26, the term "Russian entities" includes the following:

(1) Russian persons, or

(2) Entities created under Russian law (including any organization, entity, or element of the Government of the Russian Federation) or owned, in whole or in part, by Russian persons or companies.

ARTICLE 27. SIGNATURE BLOCK

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

BY: _____
Geoffrey L. Yoder
Director, Constellation Systems Division
Exploration Systems Mission Directorate

DATE: 1/30/2010

UNITED LAUNCH ALLIANCE, L.L.C.

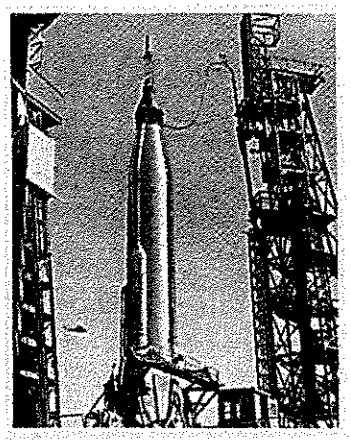
BY: _____
Randall M. Tanner
Manager, Contracts

DATE: 12/9/2009

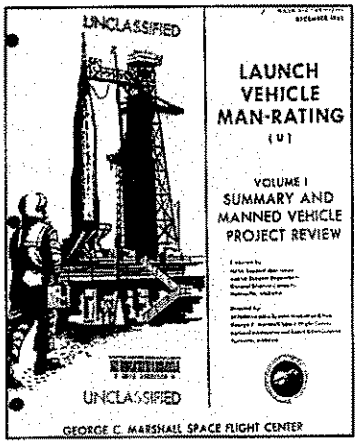
APPENDIX 1: Executive Summary

The redacted version of the Executive Summary from the participant's proposal shall be inserted.

Atlas and Delta Have Strong Human Space Flight Heritage



On February 20, 1963, John Glenn flew to orbit atop an Atlas rocket which had been converted from an Intercontinental Ballistic Missile. A key component of the human rating of Atlas was the addition of an emergency detection system called the Abort Sensing and Implementation System (ASIS). This simple system monitored a handful of key measurements to provide an abort command should the flight go seriously wrong. Given the history of Atlas flights up to that time, this concern was not unfounded. The Atlas performed as designed on all four Mercury Atlas flights, so the ASIS was never called upon to save a life.



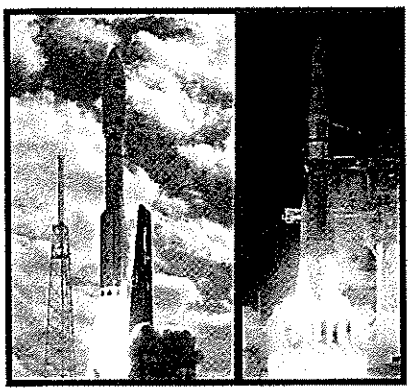
Subsequently, NASA issued a report entitled "Launch Vehicle Man Rating" (NASA 410-24-13-1) which identified two key elements to "man-rate" a launch system;

- *"Implementation of design, quality assurance, and checkout procedures to achieve as high a level of vehicle reliability as feasible"*

- *"Design of emergency-detection and abort-implementation systems to assure crew safety in the event of a vehicle malfunction"*

These two simple elements are still key today for any "human rated" launch system. Unlike 1963, Atlas V and Delta IV are mature, reliable launch vehicles. Like 1963, though, Atlas and Delta will require an Emergency Detection System (EDS) to monitor critical systems, interface with the crew, and issue an abort command. United Launch Alliance (ULA) will leverage over 50 years of Atlas and Delta launch vehicle experience along with on-going human-rating studies and analyses to develop and demonstrate a Launch Vehicle Emergency Detection System. This system will respond in real time to dynamically evolving conditions and provide reliable indication of an impending catastrophic condition.

ULA is Committed to Reducing the Risk of Commercial Crew Development

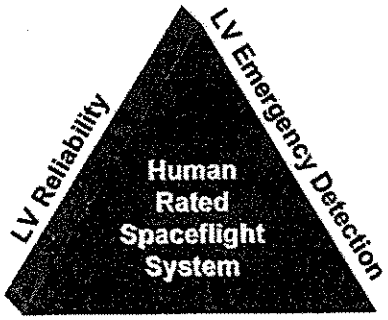


ULA has been involved in understanding Human Space Flight requirements and their impact on the Atlas V and Delta IV launch systems since these launch systems were baselined by NASA in 2002 to launch the Orbital Space Plane (OSP). Our efforts in support of Commercial Human Space Flight continue today as we assess compliance to NASA Procedural Requirements (NPR) 8705.2B "Human Rating Requirements for Space Systems." We believe that a human rated system should be comprised of three primary elements, the combination of which provides a common-sense, system-level approach to accomplish the goal of safe, reliable human transportation to

Orbit.

1) Launch vehicle reliability. The single most important factor for human space flight is demonstrated reliability. Atlas and Delta have used an evolutionary approach to launch systems development which has resulted in a long history of mission success. This record has been achieved by the combination of experienced people; robust, repeatable processes; single-fault tolerant systems; robust vehicle designs and vehicle characterization; and finally, rigorous, closed loop "Test as You Fly" processes. These processes are part of an overarching disciplined Systems Engineering approach.

2) Addition of an Emergency Detection System. Historically, human rated launch systems have incorporated an EDS that monitors critical systems and issue status, warning and abort commands. For Atlas V and Delta IV, the EDS would be common and scalable, and utilize existing sensors within an architecture that used an independent, fault tolerant failure sensing system. Operational systems such as Atlas V and Delta IV offer the advantage of flying the EDS on all missions, in addition to having flight environments that are well known and well characterized.



3) Intact abort capability. Liquid propulsion systems offer the key advantages of low dynamic pressures, minimal catastrophic failures and thrust termination prior to any abort. The resulting benign environment will maximize the ability of the crewed vehicle to successfully abort the mission and return the crew safely. ULA has worked closely with crew vehicle providers to help optimize the safety of integrated crew/launch vehicle systems.

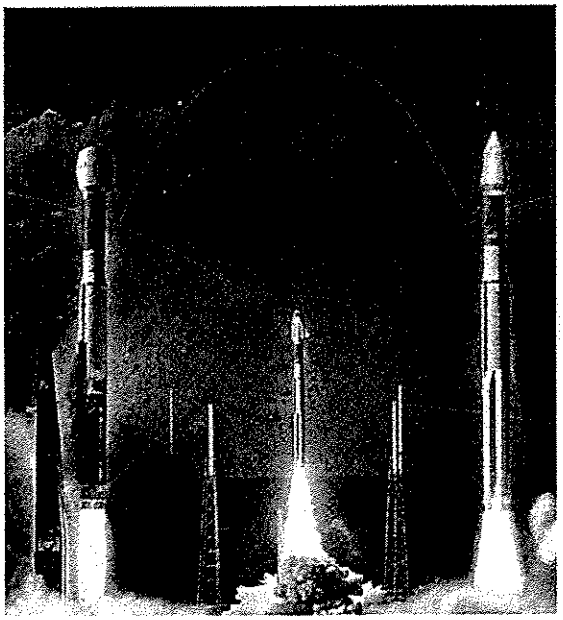
We have made significant investments in studies and analyses to help understand the impacts of these key elements on our launch vehicles for a Commercial Crew Program. Just like NASA in 1963, we have been focused on ensuring that our systems achieve as high a level of reliability as practical, and to design an EDS to assure crew safety in the unlikely event of a vehicle malfunction. We have worked closely with the Federal Aviation Administration Office of Commercial Space Transportation (FAA-AST) to incorporate their requirements. We have coordinated with the 45th Space Wing to implement changes in our Flight Termination System to account for the presence of crew on our system.

Our comprehensive Maturation Plan for Commercial Crew on Atlas or Delta includes not only the incorporation of these key elements, but also the modifications for crew ingress and egress at our launch sites. We have created detailed plans to accommodate these unique requirements in a dedicated Atlas V LC-41 Vertical Integration Facility (VIF) and Mobile Launch Platform (MLP). An equivalent implementation has been planned for Delta IV at LC-37A. The entire effort to human rate an Atlas V or Delta IV for Commercial Crew and launch the first crewed mission is expected to take approximately 4 years. This includes a full scale uncrewed demonstration flight.

Our highly reliable launch systems and our approach to human rating has been recognized and endorsed by many commercial, entrepreneurial, and traditional aerospace companies. Atlas V was baselined by several companies as their launch vehicle during the NASA Commercial

Orbital Transportation System (COTS) procurements. We continue to work closely with entrepreneurial firms such as [redacted] to provide safe and reliable Earth to Orbit transportation.

An Emergency Detection System is the Most Important Improvement to Make on a Flight-Proven Launch System



Our studies show that EDS development is the primary long-lead technical task that must be addressed prior to the launch of crew on an Atlas V or Delta IV. We have completed several key studies such as detailed Explosion Modeling, Fault Coverage Assessments, Launch Vehicle Key Parameter Selection, and Crew Display designs that have contributed to our EDS approach. We propose to design the EDS algorithms, software and hardware, and to test the system using flight and flight-like data from both nominal and failed missions. This phase of EDS design is critical to demonstrate a robust set of EDS decision-making algorithms capable of analyzing a range of real-time measurements with minimal processing lag. Initiating this work now will allow us to perform extensive ground and flight testing before the first crewed mission. We believe that the EDS implementation is the final significant element to implement for a safe and highly reliable human rated launch vehicle.

ULA Can Significantly Reduce the Risk of Developing The EDS

The building blocks of an EDS are flying today on Atlas V in the RD-180 engine health check, propellant utilization system, spacecraft separation tumble check, control sensor redundancy handling (triple and dual redundant sensors), vehicle health fault monitoring (active mode during preflight and passive mode during flight), and single fault tolerant Block 2 Avionics.

ULA will use the CCDev investment and internal funds to:

- advance EDS algorithm development and software solutions,
- determine the sensor/flight computer interface,
- address the timing challenges of collecting and processing time-critical data, and
- initiate the design of the EDS/Crew display interface.

This proposed effort will not only accelerate the fielding of a human rated launch system, but will save and create jobs at ULA and our team members, and stimulate the commercial human space flight industry.

Based on our extensive knowledge of launch vehicle design and operations, we are confident that this effort will form the foundation for an EDS that can be used on Atlas V and Delta IV. The architecture, implementation, and algorithms developed could be extensible to other human

rated exploration elements, such as Earth Departure Stages, Lunar Landers, Rovers, and lunar habitats.

Proven Management and Technical Team

ULA manages mission integration and technical activities with processes fine tuned over 50 years of launch vehicle engineering, production, integration, and launch. ULA has had 31 successful launches of Delta II, Atlas V and Delta IV since it was formed in December of 2006, which demonstrates the effectiveness of our robust systems engineering approach to Project Management. Our team maintains high reliability through the rigorous application of structured processes focused on risk mitigation, product assurance, and mission success. We fully support NASA's insight into these processes, and we encourage NASA to become an integral partner in the development of critical EDS technology.

ULA is a Joint Venture formed by Lockheed Martin Corporation and The Boeing Company and is incorporated in the state of Delaware. ULA is 100% owned by United States nationals, and is compliant with all applicable U.S. laws, regulations and policies, including but not limited to the North Korea, and Syria Nonproliferation Act, U.S. Space Transportation Policy (January 2005), the Commercial Space Act of 1998, the Commercial Space Launch Act, and the American Recovery and Reinvestment Act of 2009.

Proven Team Ensures Success of EDS Design

ULA™
United Launch Alliance

SAS

In support of NASA's CCDev Program, ULA has selected industry partners that have extensive skills and experience in the areas of propulsion, avionics, system integration, NASA Program management and architecture studies. Table 1-1 shows our partners and their applicable experience.

Table 1-1 United Launch Alliance has assembled experienced EDS partners.

Company	EDS Deveopment Role	Experience
PWR	Propulsion – RD-180, RL10, RS68	SSME, RS-68, J2-X – human space flight design, MPS design and analysis, cryo system materials, cyro system manufacturing, test, operations and qualification requirements, engine integration
SAS	Systems Integration/ Systems Safety/ Emergency Situational Awareness	Core sensor technology knowledge (RD180), integration, 2nd generation IHM, Systems Integration, Systems Safety Assessment

With unparalleled experience in expendable launch vehicle development and operation, a thorough understanding of the design enhancements required to make these highly reliable systems safe for human flight, and an immediate need for the technology, ULA is uniquely qualified and ready to work with NASA to develop and demonstrate the EDS for Commercial Crew Development. Our highly motivated team looks forward to demonstrating this key crew safety component of our future human space flight infrastructure.

APPENDIX 2: Performance Milestones and Success Criteria

CCDev ULA Company Project Milestones

Milestone 1: EDS Demonstration Project Kick-off Meeting
Success Criteria: Conduct kickoff to present program expectations, program plan and identify staffing resources
Agenda

- Introductions
- Project Overview
  - Human Rating Work to Date
  - EDS Development Context
  - Delta IV Fault Coverage Assessment
  - Proposed Effort
- Project Plan
  - Schedule
  - Demonstration Scope/Baseline
- IRAD Summary
- Staffing Assignments
- Issues/Concerns
- Summary
- Action Item Review

[redacted]

Milestone 2: Requirements Review
Success Criteria: Conduct Requirements Review to establish requirements for the EDS development and demonstration
Agenda

- Introductions
- Project Overview
- Project Status
- Demonstration Requirements
  - Proposed Demonstration Test Cases
  - EDS Algorithms
  - Controller Design Requirements
- System Level Requirements
  - Spacecraft/Launch Vehicle Requirements Allocation
  - Engine Fault Coverage Assessments Refinement
  - Expanded Algorithm Validation Requirements
  - Crew Interface Design Requirements
- Delta IV Fault Coverage Assessment Task Status
- IRAD Summary
- Issues/Concerns
- Summary
- Action Item Review

[redacted]

Milestone 3: Design Review
Success Criteria: Conduct Design Review to present the design solution for the EDS development and demonstration
Agenda

- Introductions
- Project Overview
- Project Status
- Demonstration Design
  - Testbed Design
  - Test Case Implementation
  - Software Design
  - EDS Controller Design
  - Initial Test Results
- System Level Design
  - Crew Interface Conceptual Design
  - Expanded Algorithm Validation Test Cases
- Delta IV Fault Coverage Assessment Task Status
- IRAD Summary
- Issues/Concerns
- Summary
- Action Item Review

Milestone 4: EDS Demonstration Report and Review
Success Criteria: Submit a report to document results and findings from the EDS demonstration SIL test and debrief results
Agenda

- Introductions
- Project Overview
- Project Status
- Demonstration Testbed
  - Configuration
  - Validation Test Results
- EDS Demonstration
- Real-Time Monitoring Demonstration Summary
- System Level Requirements Conclusions
- Delta IV Fault Coverage Assessment Conclusions
- IRAD Summary
- Issues/Concerns
- Summary
- Action Item Review

SPACE ACT AGREEMENT AMENDMENT ONE
BETWEEN
NATIONAL AERONAUTICS AND SPACE ADMINSTRATION
AND
UNITED LAUNCH ALLIANCE, L.L.C.
FOR
COMMERCIAL CREW DEVELOPMENT (CCDev)

PURPOSE AND AGENCY COMMITMENT

The purpose of this Amendment is to modify Space Act Agreement NNJ10TA06S to update the Appendix 2: Performance Milestones and Success Criteria and implement such other adjustments to timing and performance as agreed-to by NASA and ULA.

NASA shall provide or identify all related ARRA guidance applicable to this Agreement as provided under ARTICLE 3. RESPONSIBILITIES, paragraph A.(3), no later than the date of NASA's acceptance of Milestone 1 of APPENDIX 2, as modified herein.

In the event NASA identifies additional requirements pursuant to the above paragraph relating to the reporting of executive compensation, ULA shall have the unilateral right to terminate this Agreement upon written notice to NASA and upon such termination ULA shall have no further obligations under this Agreement.

The last sentence of ARTICLE 5. FINANCIAL OBLIGATIONS, paragraph B.(1) is modified to read:

> NASA and ULA agree that time is of the essence for the payment of milestones hereunder and each will make best efforts to ensure that milestones are accepted (if appropriate) and invoiced prior to December 31, 2010.

APPENDIX 2 is removed and replaced in its entirety with the following:

APPENDIX 2: Performance Milestones and Success Criteria

CCDev ULA Company Project Milestones

Milestone 1: EDS Demonstration Project Kick-off Meeting Success Criteria: Conduct kickoff to present program expectations, program plan and identify staffing resources	[redacted]

Agenda

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Milestone 2: Requirements Review

Success Criteria: Conduct Requirements Review to establish requirements for the EDS development and demonstration

Agenda

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Milestone 4: EDS Demonstration Report and Review

Success Criteria: Submit a report to document results and findings from the EDS demonstration SIL test and debrief results

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- Delta IV Fault Coverage Assessment Conclusions
- IRAD Summary

• Issues/Concerns • Summary • Action Item Review	

ARTICLE 27 SIGNATURE BLOCK

The terms and conditions of Space Act Agreement NNJ10TA06S, as modified by this amendment are hereby incorporated herein

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION

BY: _____
Geoffrey L. Yoder
Director, Constellation Systems Division

DATE: 18 MARCH 2010

UNITED LAUNCH ALLIANCE, L.L.C.

BY: _____
Randall M. Tanner

Manager, Contracts
9100 E. Mineral Circle
Littleton, CO 80112

DATE: 08 MARCH 2010