

Blue Origin Commercial Crew Development Round 2 (CCDev2) Space Act Agreement

NNK11MS02S

Blue Origin Space Act Agreement

Blue Origin SAA Amendment 01

Blue Origin SAA Amendment 02

Blue Origin SAA Amendment 03

Blue Origin SAA Amendment 04

Commercial Crew Development

SPACE ACT AGREEMENT NO. NNK11MS02S
BETWEEN
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND
BLUE ORIGIN, LLC
FOR
COMMERCIAL CREW DEVELOPMENT ROUND 2 (CCDev 2)

BACKGROUND

In 2009, the National Aeronautics and Space Administration (“NASA”) began the Commercial Crew Development (“CCDev”) initiatives to stimulate efforts within the private sector to develop system concepts and capabilities that could ultimately lead to the availability of commercial human spaceflight services. NASA is continuing that effort through a second round of CCDev initiatives (“CCDev 2”) in order to further foster activity leading to the development of orbital commercial Crew Transportation Systems (“CTS”). Through this CCDev 2 activity, NASA may be able to continue to spur economic growth as capabilities for new space markets are created, and reduce the gap in U.S. human spaceflight capability.

The goals of the CCDev 2 investments are to advance orbital commercial CTS concepts and enable significant progress on maturing the design and development of elements of the system, such as launch vehicles and spacecraft, with the overall objective of accelerating the availability of U.S. CTS capabilities while ensuring crew and passenger safety. This Space Act Agreement (the “Agreement” or “SAA”) represents Blue Origin’s and NASA’s commitment to encourage innovations and efficiencies in CTS concepts and capabilities to achieve these CCDev 2 goals. Specifically, Blue Origin’s approach to meeting the goals of the CCDev 2 activity is outlined in Appendix 1.

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 Blue Origin, LLC (hereinafter referred to as “Blue Origin” or “Participant”) with a place of business at 21218 – 76th Avenue South, Kent, Washington. NASA and Blue Origin may be individually referred to as a “Party” and collectively referred to as the “Parties”. 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 John F. Kennedy Space Center in Brevard County, Florida.

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ARTICLE 2. PURPOSE

The purpose of this Agreement is to provide financial and limited technical assistance to Blue Origin's advancement of commercial crew space transportation systems concepts. Blue Origin's development work must show, within the timeframe of the Agreement, significant progress in maturing the design and development of elements of a commercial CTS while ensuring crew and passenger safety. Blue Origin will receive payments from NASA upon successful completion of agreed upon milestones as described in Appendix 2 of this Agreement.

ARTICLE 3. RESPONSIBILITIES

A. Blue Origin shall:

- (1) Conduct the CCDev 2 effort according to the milestones identified in Appendix 2 to this Agreement.
- (2) Lead a quarterly project status briefing.
- (3) Designate at least one seat on each review board described in Appendix 2 for a NASA representative.

B. NASA shall:

- (1) Provide milestone payments to Blue Origin upon successful completion of each CCDev 2 milestone, subject to limitations noted below.
- (2) Participate in the quarterly project status briefing.
- (3) Appoint a NASA representative to participate in each review board described in Appendix 2, who shall have concurrence authority on aspects of the space transportation system design, engineering and operations which could affect the ISS or NASA crew members.

ARTICLE 4. SCHEDULE AND MILESTONES

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

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ARTICLE 5. FINANCIAL OBLIGATIONS AND TECHNICAL REPORTS

A. NASA's Payment Obligation

The Government's liability to make payments to Blue Origin 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) Blue Origin 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 recognizes milestones may occur prior to dates in Appendix 2 and Blue Origin shall strive to ensure timely coordination with NASA so as to allow for appropriate milestone participation and review. 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 Blue Origin 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 18 of this Agreement.

(2) Blue Origin 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. Blue Origin 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:

Bank: JPMorgan Chase Bank

Address: 1301 2nd Avenue, 28th Floor, Seattle, WA 98101

Routing Transit Number: [REDACTED]

Depositor Account Title: [REDACTED]

Depositor Number: [REDACTED]

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

Agreement Number

Invoice Number

A description of milestone event

Terms of Payment

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Payment Office
Agreed Milestone Amount

C. Financial Records and Reports

Except as otherwise provided in this Agreement, Blue Origin's relevant financial records associated with this Agreement are not subject to examination or audit by NASA.

D. Quarterly Project Status Briefings

Blue Origin shall conduct quarterly project status briefings with NASA. Progress made shall be estimated and reported in a mutually agreed to quantifiable performance method. The briefings shall describe the progress made since the last report, plans forward, and shall also describe any difficulties encountered and the corrective action necessary to recover. At each quarterly briefing, Blue Origin will provide NASA with written certification that it has not provided U.S. Government funding to any Russian entity in the previous quarter. "Russian entity," for purposes of this Agreement, is defined in Article 25. The final briefing shall describe not only work completed but also shall document how this activity has reduced the overall risk to Blue Origin's commercial crew space transportation concept and shall also document the way in which lessons learned as the result of these activities are being incorporated into the design and manufacturing efforts of Blue Origin commercial crew space transportation concept.

E. Access to Records

The Comptroller General of the United States, at its discretion and subject to applicable laws and policies, shall have access to and the right to examine records of any Party to the Agreement or any entity that participates in the performance of this Agreement that directly pertain to and involve transactions relating to the Agreement for a period of three (3) years after the Government makes the final payment under this Agreement. This paragraph only applies to any record that is created or maintained in the ordinary course of business or pursuant to a provision of law. The terms of this paragraph shall be included in arrangements in excess of \$5,000,000.00, which Blue Origin has entered into for the execution of the milestone events in this Agreement.

ARTICLE 6. DISSEMINATION OF PUBLIC INFORMATION

A. NASA or Blue Origin may, consistent with Federal law and this Agreement, release general information regarding its participation in this Agreement as desired.

B. Blue Origin 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,

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support, sponsorship, or endorsement of NASA, which does not, in fact, exist. In addition, with the exception of release of general information in accordance with paragraph A above, Blue Origin agrees that any proposed public use of the NASA name or initials shall be submitted by Blue Origin in advance to the NASA Administrative Contact, who will submit the proposed use to the NASA Assistant Administrator for Public Affairs or designee ("NASA Public Affairs") for review and approval. NASA approval shall be based on applicable law and policy governing the use of the NASA name and initials. 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. Blue Origin 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 to NASA 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. Blue Origin agrees that nothing in this Agreement will be construed to imply that NASA authorizes, supports, endorses, or sponsors any product or service of Blue Origin 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 Blue Origin 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 Blue Origin to use NASA furnished services, technical expertise, or Government Property to fulfill its obligations under this Agreement, any decision by Blue Origin to use NASA furnished services, technical expertise, or Government Property shall be at Blue Origin's discretion. Blue Origin shall remain solely responsible for completion of its milestones under this Agreement regardless of the availability or use of NASA services, technical expertise, or Government Property.

B. Blue Origin may 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. Blue Origin will be responsible for ensuring timely, accurate work of its team, including any NASA Centers, and, if necessary, replacing such subcontractors/partners in order to meet milestones.

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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, and within 10 calendar days of any change in status under A. through D. below (including the addition of any new contractor/partner), Blue Origin shall certify to the best of its knowledge and belief the following to the NASA Administrative Contact:

- A. Neither Blue Origin nor any of its contractors/partners are presently debarred, suspended, proposed for debarment, or otherwise declared ineligible for award of funding by any Federal agency.
- B. Neither Blue Origin nor any of its contractors/partners have 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. Blue Origin 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. Blue Origin is an eligible participant as defined in Section 4.2 of the CCDev 2 Announcement.

ARTICLE 10. LIABILITY AND RISK OF LOSS

- A. Blue Origin 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, Blue Origin employees or the employees of Blue Origin's related entities, or for damage to, or loss of, Blue Origin'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. Blue Origin 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,

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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 11. LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS

Blue Origin 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 12. 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 Blue Origin that is assigned, tasked, or contracted with to perform specified NASA or Blue Origin 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 Blue Origin and employees of any Related Entity of Blue Origin. Blue Origin shall ensure that its employees and employees of any Related Entity that perform Blue Origin 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 Blue Origin 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 Blue Origin include a restrictive notice that NASA or Blue Origin deems to be ambiguous or unauthorized, NASA or Blue Origin 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.

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(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 Blue Origin believes that any of the events or conditions that remove restriction on the use, disclosure, or reproduction of the Data apply, NASA or Blue Origin 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 Blue Origin has furnished, or is required to furnish to the U.S. Government without restriction on disclosure and use.

(11) Blue Origin 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, Blue Origin should mark each page containing Proprietary Data with the following, or a similar, legend: "Proprietary Data" or "PROPRIETARY DATA – use and disclose only in accordance with notice on title or cover page."

NOTICE OF PROPRIETARY INFORMATION

Blue Origin LLC proprietary rights are included in the information disclosed herein. Recipient by accepting this document agrees that neither this document nor the information disclosed herein nor any part thereof shall be reproduced or transferred to other documents or used or disclosed to others for manufacturing or for any other purpose except as specifically authorized in writing by Blue Origin LLC.

or

Proprietary Data Notice

These data herein include *<enter as applicable: "Background Data" or "Data Produced by Blue Origin 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

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with restrictions identified in the Space Act Agreement *<may list specific restrictions listed in the Agreement>*.

B. Data First Produced by Blue Origin under this Agreement

(1) Data first produced by Blue Origin in carrying out Blue Origin'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 Blue Origin's performance under this Agreement. If Blue Origin 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 Blue Origin 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 Blue Origin, 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 Blue Origin, 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 Blue Origin, 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 Blue Origin, 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 Blue Origin, 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 Blue Origin Administrative Point of Contact. Upon receipt of such determination, Blue Origin 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 Blue Origin 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 16.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 Blue Origin in carrying out Blue Origin's responsibilities under this Agreement by or on behalf of NASA for Government purposes.

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(4) The parties will negotiate rights in Data in the event of termination for any other reason; provided that neither party will have any obligation under this paragraph C.(4) to grant rights except as specifically provided elsewhere in this Agreement.

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 Blue Origin, 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 Blue Origin 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 Blue Origin, 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 Blue Origin, 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 Blue Origin, 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 Blue Origin, 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 Blue Origin, 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 Blue Origin Administrative Point of Contact. Upon mailing of such determination, Blue Origin 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 Blue Origin 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 16.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.

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(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 Blue Origin in a manner that allows Blue Origin 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 Blue Origin.

E. Data Disclosing an Invention

In the event Data exchanged between NASA and Blue Origin 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 Blue Origin 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 Blue Origin 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 Blue Origin's performance under this Agreement. Upon completion of activities under this Agreement, such Data will be disposed of as requested by Blue Origin.

(2) At the time of execution of this Agreement, the Parties agree that the Background Data identified in Appendix 3 embodies Proprietary Data that will be provided to NASA.

H. Handling of Data

(1) In the performance of this Agreement, Blue Origin and any Related Entity of Blue Origin 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, Blue Origin may request from NASA, and NASA may provide, Proprietary Data of third parties, with the express understanding that Blue Origin will use and protect such Data in accordance with this Article.

(b) The Parties agree that, during the term of this Agreement, Blue Origin may request from NASA, and NASA may provide, U.S. Government Data, with the express understanding that Blue Origin 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 Blue Origin, to the extent NASA has determined it has the right to distribute, under a separate Software Usage Agreement with the express understanding that Blue Origin will use and protect such related Data in accordance with this Article: access to all versions and all files within NASA's Materials and Processes Technical Information System (MAPTIS) database. Unless Blue Origin 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, Blue Origin 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, Blue Origin 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 Blue Origin'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 Blue Origin 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

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disclosure or use of such information unless (1) Blue Origin orally informs NASA before initial disclosure that such information is considered to be Proprietary Data, and (2) Blue Origin 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 13. 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 Kennedy Space Center Patent Counsel. Correspondence with the Patent Representative under this clause will be sent to the address below:

Patent Counsel
Mail Code CC-A
Office of the Chief Counsel
NASA John F. Kennedy Space Center, FL 32899

(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 Blue Origin that is assigned, tasked, or contracted with to perform specified NASA or Blue Origin 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 Blue Origin submits to the Patent Representative a written statement, containing supporting details,

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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, Blue Origin 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 Blue Origin in any such statement and any other available information relating to the circumstances surrounding the making of the invention and will notify Blue Origin 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 Blue Origin'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 Blue Origin, in accordance with provisions of 14 C.F.R. Part 1245, Subpart 1, rights to inventions made by Blue Origin in the performance of work under this Agreement. Therefore, upon petition submitted by Blue Origin, 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 Blue Origin. If such a petition is not submitted, Blue Origin 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 Blue Origin 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

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(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 Blue Origin 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 Blue Origin

(1) Blue Origin is hereby granted a revocable, nonexclusive, royalty-free license in each patent application filed in any country on an invention made by Blue Origin under this Agreement and any resulting patent in which the Government acquires title, unless Blue Origin fails to disclose such invention within the times specified in paragraph E.(2) of this clause. Blue Origin's license extends to its domestic subsidiaries and affiliates, if any, within the corporate structure of which Blue Origin is a party and includes the right to grant sublicenses of the same scope to the extent Blue Origin 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 Blue Origin's business to which the invention pertains.

(2) Blue Origin'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 Blue Origin 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 Blue Origin, 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, Blue Origin will be provided a written notice of the Administrator's intention to revoke or modify the license, and Blue Origin will be allowed 30 calendar days (or such other time as may be authorized by the Administrator for good cause shown by Blue Origin) after the notice to show cause why the license should not be revoked or modified. Blue Origin 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) Blue Origin shall establish and maintain active and effective procedures to assure that inventions made under this Agreement are promptly identified and disclosed to Blue Origin 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

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(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 Blue Origin 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.

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(1) Blue Origin is hereby granted a revocable, nonexclusive, royalty-free license in each patent application filed in any country on an invention made by Blue Origin under this Agreement and any resulting patent in which the Government acquires title, unless Blue Origin fails to disclose such invention within the times specified in paragraph E.(2) of this clause. Blue Origin's license extends to its domestic subsidiaries and affiliates, if any, within the corporate structure of which Blue Origin is a party and includes the right to grant sublicenses of the same scope to the extent Blue Origin 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 Blue Origin's business to which the invention pertains.

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

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

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

(2) If the Patent Representative learns of an unreported Blue Origin invention that the Patent Representative believes may have been made under this Agreement, Blue Origin 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, Blue Origin 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 by a Related Entity (but not including fabrication or supply of components to Blue Origin's specifications or 'build to print' for Blue Origin's 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 Blue Origin 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.

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

(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) Blue Origin 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, Blue Origin 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 Blue Origin's substantial contribution of funds, facilities and/or equipment to the work performed under this Agreement, Blue Origin 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 Blue Origin 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 Blue Origin 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, Blue Origin 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) Blue Origin 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 Blue Origin, 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 Blue Origin, 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 Blue Origin, 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;

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(b) Such action is necessary because Blue Origin, 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 Blue Origin, 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 Blue Origin, 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 Blue Origin, 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.

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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 14. 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 any direct, general, special, consequential, indirect, or incidental damages attributed to such goods, services, materials, products, processes, information, or data furnished under this Agreement.

ARTICLE 15. TERM OF AGREEMENT

This Agreement becomes effective upon the date of the last signature below and shall remain in effect until the completion of all obligations of both Parties hereto, or two (2) years from the date of the last signature, whichever comes first.

ARTICLE 16. 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 Blue Origin has failed to perform under this Agreement, including failure to meet a scheduled milestone as identified and described in Appendix 2. Before making such a notification, NASA will consult with Blue Origin 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 12 and 13 of this Agreement.

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(2) Blue Origin will not be entitled to any additional payments from the Government due to a termination for failure to meet a milestone. NASA and Blue Origin will negotiate in good faith any other outstanding issues between the Parties. Failure of the Parties to agree will be resolved pursuant to Article 18, Dispute Resolution.

C. Unilateral Termination by NASA

(1) NASA may unilaterally terminate this Agreement upon written notice in the following circumstances: (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, Blue Origin 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 Blue Origin wishes to pursue the activities defined in Appendix 2 exclusively using its own funding. Upon such a termination, NASA and Blue Origin 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 and any payment is subject to the provisions of Article 5.

D. Limitation on Damages.

In the event of any termination by NASA, neither NASA nor Blue Origin 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.

Blue Origin will have title to property acquired or developed by Blue Origin and its contractors/partners with funding provided under this Agreement, in whole or in part to conduct the activities defined in Appendix 2. In the event of termination of this Agreement for any reason, NASA may purchase such property as provided in Article 26 below.

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ARTICLE 17. CONTINUING OBLIGATIONS

The obligations of the Parties set forth in the provisions of Article 10 (Liability and Risk of Loss) and Articles 12-13 (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 18. DISPUTE RESOLUTION

All disputes concerning questions of fact or law arising under this Agreement shall be referred by the claimant in writing to the Blue Origin 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 KSC Commercial Crew Development Program Manager and the Blue Origin Program Manager 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 KSC Commercial Crew Development Program 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.

ARTICLE 19. PRINCIPAL POINTS OF CONTACT

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

Commercial Crew Development

NASA Administrative Contact

David Shreve
Agreements Officer
John F. Kennedy Space Center
Mail Code: OP
NASA Kennedy Space Center, FL 32899

Phone: 321-867-3456
Fax: 321-867-1166
E-mail: david.shreve@nasa.gov

NASA Technical Contact

Scott B. Thurston
Commercial Crew
John F. Kennedy Space Center
Mail Code: FA
NASA Kennedy Space Center, FL 32899

Phone: 321-861-9102
Fax: 321-867-9344
E-mail: scott.b.thurston@nasa.gov

Blue Origin Administrative Contact

Robert Millman
Administrative Contact
Blue Origin, LLC
21218 – 76th Ave South
Kent, WA 98032

Phone: [REDACTED]
Fax: [REDACTED]
E-mail: [REDACTED]

Blue Origin Technical Contact

Gary Lai
Technical Lead
Blue Origin, LLC
21218 – 76th Ave South
Kent, WA 98032

Phone: [REDACTED]
Fax: [REDACTED]
E-mail: [REDACTED]

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ARTICLE 20. 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 21. 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 22. 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 23. APPLICABLE LAW AND SEVERABILITY

A. 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.

B. 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.

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ARTICLE 24. EXPORT LICENSES

Blue Origin 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, Blue Origin 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 2 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 25. LIMITATIONS ON ACTIVITIES WITH RUSSIAN ENTITIES FOR GOODS OR SERVICES

A. Blue Origin shall not provide 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, Blue Origin 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 be made under the transaction.

(2) Blue Origin 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>

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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.pmdtc.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, Blue Origin 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.

D. For the purpose of this Article 25, 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 26. TITLE AND RIGHTS IN PROPERTY

Blue Origin will have title to tangible personal property acquired or developed under this Agreement, including developed or acquired by Blue Origin for CCDev 2 efforts. In the event of termination of this Agreement for any reason under Article 16, NASA will have the right to purchase any such property. The Parties will negotiate in good faith purchase prices for specific items of property.

ARTICLE 27. OPTIONAL MILESTONE AUTHORIZATION

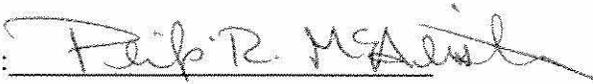
Milestones listed in Appendix 2(a), Performance Milestones and Success Criteria, form the initial negotiated and awarded effort under this Agreement. Milestones in Appendix 2(b) are optional Performance Milestones related to Blue Origin's crew transportation development effort. These optional milestones include notional funding amounts and create no obligation for either party to perform unless specific separate investment and authorization is provided by

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the Government and accepted by Blue Origin. If, during the period of performance of this SAA, the Government wishes to add any of the identified optional Performance Milestones, NASA will provide written notification of this intention to Blue Origin. This notification will be provided by the Associate Administrator for Exploration Systems or his designee. If following receipt of such notice Blue Origin agrees, then the parties will negotiate in good faith a revised schedule and milestone funding amount not to exceed the amount listed for that milestone in Appendix 2(b). Final awarded milestone amounts will be based on and are subject to the availability of funds.

ARTICLE 28. SIGNATURE BLOCK

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION

BY: 
Philip McAlister
Special Assistant to the Associate Administrator
for Exploration Systems

DATE: 4/18/2011

BLUE ORIGIN, LLC

BY: 
Robert Meyerson
Program Manager

DATE: 3/29/11

APPENDIX 1: Executive Summary

EXECUTIVE SUMMARY

Blue Origin, LLC is a private company developing vehicles and technologies to dramatically lower the cost and increase the reliability of human access to space. Building on its success under the CCDev 1 program, Blue Origin proposes to further accelerate development of a Crew Transportation System (CTS) capable of transporting crew and cargo safely and affordably to low Earth orbit (LEO). Under CCDev 2, Blue Origin proposes that NASA co-fund the following critical development activities:

- (1) Space Vehicle design maturation up through System Requirements Review (SRR);
- (2) pusher escape ground and flight testing; and
- (3) engine component testing.

Crew Transportation System

Blue Origin is developing a Crew Transportation System, comprised of a Space Vehicle (SV) launched first on an Atlas V launch vehicle and then on Blue Origin's own Reusable Booster System (RBS). NASA funding through CCDev 2 and the future Commercial Crew program will accelerate availability of the Blue Origin CTS.



Figure 1 Blue Origin Space Vehicle

The biconic Space Vehicle will be capable of carrying seven astronauts and will transfer NASA crew and cargo to and from the International Space Station (ISS), serve as an ISS emergency escape vehicle for up to 210 days, and perform a land landing to minimize the costs of recovery and reuse. It will also conduct separate commercial missions for science research, private adventure, and travel to other LEO destinations.

Blue Origin's Space Vehicle is designed to ride on multiple boosters. The Atlas V was chosen for initial capability because it has a proven launch track record, has the required performance capability, can be adapted for human spaceflight operations, and is operated from facilities close to the Kennedy Space Center.

Blue Origin is simultaneously developing a Reusable Booster System to dramatically lower the cost of space access. In the coming decade, use of expendable booster stages will be a substantial portion of NASA's total cost of space access. Each one-time use of current expendable booster technology represents a prime opportunity for cost reduction. Blue Origin's RBS employs deep-throttling, restartable engines to perform vertical take-off, vertical landing (VTVL) maneuvers for booster recovery and reuse. CCDev 2 funding will shorten the development time of these engines, accelerating the availability of Blue Origin's Reusable Booster System.

Blue Origin requests a total of \$22,005,000 in CCDev 2 funding, with the possibility of an additional \$5,172,000 for optional milestones, to speed maturation of the orbital Crew Transportation System in the following three projects:

Maturing the Orbital Space Vehicle Design

Under CCDev 2, Blue Origin proposes to advance the Space Vehicle design through completion of key system trades; design of the thermal protection system (to be performed in partnership with NASA Ames Research Center); definition of the biconic shape including aerodynamic analyses, CFD analysis, and wind tunnel testing; development of a draft Space Vehicle to Atlas V Interface Definition Document (IDD); and completion of a Mission Concept Review (MCR) and System Requirements Review (SRR) resulting in a baseline definition architecture and system requirements.

Blue Origin requests \$2,705,000 in NASA funding for the Space Vehicle Design Maturation Project.

Maturing the Pusher Escape System

The Space Vehicle uses a pusher escape system allowing full-envelope crew escape capability in the event of an anomaly on the launch vehicle. The pusher escape system is a key enabler of full-vehicle reusability, as well as improving the safety of human access to space.

The use of an engine in a pusher configuration is a high technical risk in the Space Vehicle concept, differing substantially from the traditional towed-tractor escape tower concepts utilized on Mercury, Apollo, and Orion. The pusher escape configuration requires active thrust vector control (TVC) to steer the Space Vehicle away from the lower stage during ascent. Building on TVC ground testing completed under CCDev 1, Blue Origin proposes to exercise the corners of the escape flight envelope by conducting a Pad Escape abort test and, optionally, a high dynamic pressure (Max-Q) abort test.

Blue Origin requests \$8,900,000 in NASA funding for the Pusher Escape Risk Reduction Project, with the possibility of an additional \$2,172,000 for optional milestones.

Accelerating Engine Development

Blue Origin also proposes to speed development of its Reusable Booster System through accelerated testing of its 100,000 lbf liquid oxygen/liquid hydrogen (LOx/LH2) engine. Development of Blue Origin's restartable, deep-throttle engine is pacing the entire orbital RBS program. Under CCDev 2, Blue Origin proposes to test the full-scale thrust chamber at NASA's Stennis Space Center and, optionally, perform development testing of the engine's fuel and oxidizer turbopumps.

Blue Origin requests \$10,400,000 in NASA funding for the RBS Engine Risk Reduction Project with the possibility of an additional \$3,000,000 for optional milestones. Partnering with NASA will not only accelerate the Reusable Booster System; it will also speed development of a low-cost LOx/LH2 engine suitable for a variety of other upper stage applications and deep-throttling exploration missions.

Incremental Development of Human Space Flight Capabilities

Blue Origin's incremental development approach uses suborbital tests to understand and characterize our system and retire development risks. The suborbital vehicle will be fully reusable and capable of flying three or more astronauts to an altitude of over 328,000 ft (above 100 km) for science research and adventure. The suborbital booster is currently undergoing integrated testing. The suborbital capsule will separate from the subscale booster prior to reentry, followed by a land landing for recovery and reuse. The suborbital capsule will baseline key technologies for the orbital Space Vehicle, and is currently undergoing final assembly.

Experienced Team With Key Resources Already In Place

Blue Origin has assembled a team of experienced space professionals that successfully completed all milestones co-funded by NASA under the CCDev 1 program. Simultaneously, Blue Origin has continued to pursue development, assembly and testing of its suborbital booster and separating capsule, which will demonstrate critical technologies needed for Blue Origin's orbital CTS.

The Blue Origin CCDev 2 team includes:

- **NASA Ames Research Center**, for system trades, design, and test activities related to Space Vehicle design maturation;
- **NASA Stennis Space Center**, for engine thrust chamber testing; and
- **United Launch Alliance (ULA)**, for integration of the Space Vehicle with the Atlas V launch vehicle.

In addition, Blue Origin's team includes the following major suppliers:

- **Aerojet**, for solid rocket motors and test facilities;
- **Lockheed Martin Missiles & Fire Control High Speed Wind Tunnel (HSWT)**, for high-speed wind tunnel testing of the Space Vehicle; and
- **U.S. Air Force Holloman High Speed Test Track (HHSTT)**, located outside Alamogordo, New Mexico, for testing the pusher escape system.

Eligible for CCDev Funding

As a limited liability company organized under the laws of Washington State and 100 percent owned by United States nationals, Blue Origin is eligible to participate in the CCDev 2 program.

Private Co-Funding Secured

Blue Origin's founder and investor, Jeff Bezos, recognizes that successful development of an innovative space launch capability is a long-term endeavor and is committed to steady funding for development efforts to achieve a commercial orbital vehicle. NASA co-funding under the CCDev 2 program will accelerate Blue Origin's development of the reusable Crew Transportation System.

APPENDIX 2(a): Performance Milestones and Success Criteria

1. Space Vehicle Design Maturation Project

<p>Milestone 1.1 – SV Kickoff Meeting</p> <p>Hold a meeting at Blue Origin headquarters in Kent, WA to brief NASA personnel on the project implementation plan. This review will be conducted according to Appendix 2(c)</p> <p><u>Success Criteria:</u> Completion of the meeting.</p>	<p>May 2011 \$905,000</p>
<p>Milestone 1.2 – SV Mission Concept Review</p> <p>Hold a meeting at Blue Origin headquarters in Kent, WA to review the Space Vehicle mission concept. This review will be conducted according to the Mission Concept Review (MCR) definition in Appendix 2(c).</p> <p><u>Success Criteria:</u> Completion of the meeting and provide NASA with drafts of SV Architectural Description Document and SV Concept of Operations for Atlas V.</p>	<p>September 2011 \$900,000</p>
<p>Milestone 1.3 – SV System Requirements Review</p> <p>Hold a meeting at Blue Origin headquarters in Kent, WA to review the system requirements of the Space Vehicle. This review will be conducted according to the System Requirements Review (SRR) definition in Appendix 2(c).</p> <p><u>Success Criteria:</u> Completion of the meeting and provide NASA with updates of drafts of SV Architectural Description Document and SV Concept of Operations for Atlas V, and drafts of SV System Specification, SV Development Pan, SV-to-Atlas-V Interface Definition, and SV Master Verification Plan.</p>	<p>May 2012 \$900,000</p>

APPENDIX 2(a): Performance Milestones and Success Criteria

(continued)

2. Pusher Escape Risk Reduction Project

<p>Milestone 2.1 – Pusher Escape Kickoff Meeting Hold a meeting at Blue Origin headquarters in Kent, WA to brief NASA personnel on the project implementation plan. <u>Success Criteria:</u> Completion of the meeting.</p>	<p>May 2011 \$2,000,000</p>
<p>Milestone 2.2 – Pusher Escape Test Vehicle #1 Shipment Assembly of the first Pusher Escape Flight Test Vehicle is complete, except for installation of the pusher escape subsystem and separation mechanisms which will be installed at the test range. <u>Success Criteria:</u> Provide NASA with a letter certifying that the First Pusher Escape Flight Test Vehicle has departed Kent, WA for flight test range.</p>	<p>December 2011 \$2,000,000</p>
<p>Milestone 2.3 – Pusher Escape Ground Firing Conduct an initial ground test of the pusher escape rocket motor and thrust vector control system to be used during the flight test campaign. <u>Success Criteria:</u> Provide NASA with a test video and a ‘quick look’ report summarizing the data gathered during the test.</p>	<p>January 2012 \$3,000,000</p>
<p>Milestone 2.6 – Pusher Escape Pad Escape Test Conduct a test with one of the flight test vehicles simulating an escape from a booster on the launch pad. <u>Success Criteria:</u> Provide NASA with a test video and a ‘quick look’ report summarizing the data gathered during the test.</p>	<p>April 2012 \$1,900,000</p>

APPENDIX 2(a): Performance Milestones and Success Criteria
(continued)

3. RBS Engine Risk Reduction Project

<p>Milestone 3.1 – Engine Kickoff Meeting Hold a meeting at Blue Origin headquarters in Kent, WA to brief NASA personnel on the project implementation plan. Success Criteria: Completion of the meeting.</p>	<p>May 2011 \$3,400,000</p>
<p>Milestone 3.2 – Engine TCA Interface and Test Plan Review Hold a meeting to review test article interface data, Interface Control Diagram (ICD) and test plan. Success Criteria: Provide NASA with a copy of test ICD and test plan.</p>	<p>September 2011 \$4,000,000</p>
<p>Milestone 3.4 – Engine TCA Test Conduct pressure-fed test of the full-scale thrust chamber assembly (TCA). Success Criteria: Provide NASA with a ‘quick look’ report summarizing the data gathered during the test.</p>	<p>May 2012 \$3,000,000</p>

APPENDIX 2(b): Optional Performance Milestones and Success Criteria

The following milestones are optional as provided in Article 27 of the Space Act Agreement to which this Appendix 2(b) is attached:

Pusher Escape Risk Reduction Effort Optional Milestones:

Milestone 2.5 – Pusher Escape Max-Q Sled Test Calibration Run

Conduct a non-separating test with one of the flight test vehicles on a rocket sled track. Accelerate the flight test vehicle on a rocket sled track up to the velocity that it will separate during the Milestone 2.7 Pusher Escape Max-Q Sled Test Egress Run, before braking.

Success Criteria: Provide NASA with a test video and a ‘quick look’ report summarizing the data gathered during the test.

[Date TBD]

\$1,500,000

Milestone 2.7 – Pusher Escape Max-Q Sled Test Egress Run

Accelerate the flight test vehicle on a rocket sled track up to a velocity simulating maximum dynamic pressure during booster ascent before separating and initiating an escape maneuver.

Success Criteria: Provide NASA with a test video and a ‘quick look’ report summarizing the data gathered during the test.

[Date TBD]

\$672,000

RBS Engine Risk Reduction Project Optional Milestones:

Milestone 3.3 – Engine Pump Cold Gas Drive Test

Conduct cold gas drive test of rotordynamics for approximately 15 seconds on oxidizer pump and approximately 3 seconds on fuel pump.

Success Criteria: Provide NASA with a ‘quick look’ report summarizing the data gathered during the test.

[Date TBD]

\$2,000,000

Milestone 3.5 – Engine Pump Hot Gas Drive Test

Conduct hot gas drive test of rotordynamics for approximately 30 seconds on both fuel and oxidizer pumps.

Success Criteria: Provide NASA with a ‘quick look’ report summarizing the data gathered during the test.

[Date TBD]

\$1,000,000

APPENDIX 2(c): Performance Milestones and Success Criteria:
MCR & SRR (continued)

Milestone 1.1 – SV Kickoff Meeting	
Entrance Criteria	Success Criteria
<p>1. Development of the project implementation plan, including:</p> <ul style="list-style-type: none"> a. Project scope and objectives b. Project organization c. Technical approach d. Project risks and mitigation plans e. Project schedule f. Project budget <p>The above list will also serve as the agenda for the meeting.</p> <p>2. . At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting.</p>	<p>1. Completion of the meeting.</p>
Milestone 1.2 – SV Mission Concept Review (MCR)	
Entrance Criteria	Success Criteria
<ul style="list-style-type: none"> 1. Mission goals and objectives 2. Analysis of alternative concepts 3. Preliminary Concept of operations 4. Preliminary risk assessment 5. Conceptual test and evaluation strategy. 6. Preliminary technical plans 7. Conceptual life-cycle support strategies (logistics, manufacturing, and operation). 8. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting. 	<ul style="list-style-type: none"> 1. Mission goals and objectives are defined 2. Preliminary set of high level mission requirements 3. The mission is feasible 4. Concept evaluation criteria established 5. Technical planning is sufficient to proceed to the next phase. 6. Risk and mitigation strategies have been identified

APPENDIX 2(c): Performance Milestones and Success Criteria:

Milestone 1.3 – SV System Requirements Review (SRR)	
Entrance Criteria	Success Criteria
<p>1. Successful completion of the MCR</p> <p>2. The following documents for system elements are available, and responses made to all MCR Requests for Actions (RFAs) and Review Item Discrepancies (RIDs)</p> <p>Prior to the review:</p> <ul style="list-style-type: none"> a. system requirements document; b. preliminary system requirements allocation to the next lower level system; c. updated concept of operations; d. initial document tree; <p>As part of the SRR Design Review Charts:</p> <ul style="list-style-type: none"> e. project risk assessment and potential mitigations; f. risk management approach; g. system development approach; h. preliminary human rating strategy i. software development approach; j. system safety and mission assurance approach ; k. verification and validation approach <p>3 . At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting.</p> <p>4. Where possible, entrance criteria information shall be provided to NASA at least 5 calendar days prior to the review when NASA input is required.</p>	<p>1. The project utilizes a sound process for the allocation and control of requirements</p> <p>2. Draft System Requirements definition is complete</p> <p>3. External Interfaces defined</p> <p>4. Preliminary Requirements allocation</p> <p>5. Preliminary verification approaches identified</p> <p>6. Major risks have been identified and assessed, with mitigation strategies noted</p>

Pusher Escape Risk Reduction Project Criteria and Deliverables:

2.1 - Pusher Escape Kickoff Meeting	
Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> 1. Development of the project implementation plan, including: <ol style="list-style-type: none"> a. Project scope and objectives b. Project organization c. Technical approach d. Project risks and mitigation plans e. Project schedule f. Project budget 2. At least 5 calendar days prior to meeting, delivery to NASA of: <ol style="list-style-type: none"> a. slide package to be reviewed at meeting b. slide package summarizing prior work during CCDev 1 on pusher escape system risk reduction. 	<ol style="list-style-type: none"> 1. Completion of the meeting.

2.2 - Pusher Escape Test Vehicle #1 Shipment	
Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> 1. Pre-ship review conducted. 2. Transportation arrangements made. 3. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting. 	<ol style="list-style-type: none"> 1. Provide NASA with a letter certifying that entrance criteria have been met and the vehicle has departed Kent, WA for flight test range.

2.3 - Pusher Escape Ground Firing	
Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> 1. Test Plan and Test Procedure released. 2. Pre-test prediction published. 3. Test article assembled. 4. Test HAZOP review conducted and all action items stemming from review closed. 5. Test Readiness Review conducted. 6. NASA personnel invited to be present as witness at test. 7. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting. 	<ol style="list-style-type: none"> 1. Completion of the test. 2. Provide NASA with a letter certifying that entrance criteria have been met. 3. Provide NASA with a video of test. 4. Provide NASA with a quick look report summarizing the data gathered during the test.

2.5 - Pusher Escape Max-Q Sled Test Calibration Run	
Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> 1. Test Plan and Test Procedure released. 2. Pre-test prediction published. 3. Test article assembled. 4. Test HAZOP review conducted and all action items stemming from review closed. 5. Test Readiness Review conducted. 6. NASA personnel invited to be present as 	<ol style="list-style-type: none"> 1. Completion of the test. 2. Provide NASA with a letter certifying that entrance criteria have been met. 3. Provide NASA with a video of test. 4. Provide NASA with a quick look report summarizing the data gathered during the test.

Commercial Crew Development

<p>witness at test. 7. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting.</p>	
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2.6 - Pusher Escape Pad Escape Test

Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> 1. Test Plan and Test Procedure released. 2. Pre-test prediction published. 3. Test article assembled. 4. Test HAZOP review conducted and all action items stemming from review closed. 5. Test Readiness Review conducted. 6. NASA personnel invited to be present as witness at test. 7. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting. 	<ol style="list-style-type: none"> 1. Completion of the test. 2. Provide NASA with a letter certifying that entrance criteria have been met. 3. Provide NASA with a video of test. 4. Provide NASA with a quick look report summarizing the data gathered during the test.

Commercial Crew Development

2.7 - Pusher Escape Max-Q Sled Test Egress Run

Entrance Criteria	Success Criteria
<ol style="list-style-type: none">1. Test Plan and Test Procedure released.2. Pre-test prediction published.3. Test article assembled.4. Test HAZOP review conducted and all action items stemming from review closed.5. Test Readiness Review conducted.6. NASA personnel invited to be present as witness at test.7. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting.	<ol style="list-style-type: none">1. Completion of the test.2. Provide NASA with a letter certifying that entrance criteria have been met.3. Provide NASA with a video of test.4. Provide NASA with a quick look report summarizing the data gathered during the test.

Commercial Crew Development

Engine Risk Reduction Project Criteria and Deliverables:

Milestone 3.1 – Engine Kickoff Meeting	
Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> 1. Development of the project implementation plan, including: <ol style="list-style-type: none"> a. Project scope and objectives b. Project organization c. Technical approach d. Test requirements e. Project risks and mitigation plans f. Project schedule g. Project budget 2. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting. 	<ol style="list-style-type: none"> 1. Completion of the meeting.

Milestone 3.2 – Engine TCA Interface and Test Plan Review	
Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> 1. Completion of ICD with Stennis. 2. Completion of draft test plan with Stennis. 3. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting. 	<ol style="list-style-type: none"> 1. Completion of the meeting. 2. Delivery of meeting minutes to NASA.

Milestone 3.3 – Engine Pump Cold Gas Drive Test	
Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> 1. Completion of the test plan. 2. Completion of all test procedures. 3. Completion of test readiness review, including HAZOP. 4. NASA personnel invited to be present as witness at test. 5. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting. 	<ol style="list-style-type: none"> 1. Completion of the tests. 2. Provide NASA with a letter certifying that entrance criteria have been met. 3. Provide NASA with a quick look report summarizing the data gathered during the test. 4. Provide NASA with a test video.

Milestone 3.4 – Engine TCA Test	
Entrance Criteria	Success Criteria
<ol style="list-style-type: none"> 1. Completion of final test plan with Stennis. 2. Completion of test procedures and sequences with Stennis. 3. Completion of test readiness review with Stennis, including HAZOP. 4. NASA personnel invited to be present as witness at test. 5. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting. 	<ol style="list-style-type: none"> 1. Completion of the tests. 2. Provide NASA with a letter certifying that entrance criteria have been met. 3. Provide NASA with a quick look report summarizing the data gathered during the test. 4. Provide NASA with a video of test.

Commercial Crew Development

Milestone 3.5 – Engine Pump Hot Gas Drive Test

Entrance Criteria	Success Criteria
<ol style="list-style-type: none">1. Completion of the test plan.2. Completion of all test procedures.3. Completion of test readiness review, including HAZOP.4. NASA personnel invited to be present as witness at test.5. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting.	<ol style="list-style-type: none">1. Completion of the tests.2. Provide NASA with a letter certifying that entrance criteria have been met.3. Provide NASA with a quick look report summarizing the data gathered during the test.4. Provide NASA with a video of test.

APPENDIX 3: Blue Origin Proprietary Data

- Blue Origin’s December 9, 2010 proposal to NASA submitted in response to the Commercial Crew Development Round 2 solicitation number NASA-CCDev-2 (the “CCDev 2 Proposal”), Blue Origin’s February 28, 2011 CCDev 2 – Supplemental Information Briefing provided to NASA, Blue Origin’s March 2, 2011 Response to NASA comments on strengths and weaknesses in proposal submitted by Blue Origin related to the CCDev 2 Proposal, and any supplements Blue Origin submits to NASA with respect to the CCDev 2 Proposal;

- Blue Origin’s vehicles designed, conceived, and/or assembled prior to the date both NASA and Blue Origin signed this Agreement, including but not limited to airframe structure, avionics, instrumentation, GN&C software, propulsion system, separation mechanism, and primary and terminal decelerator for the following:
 - *New Shepard* Crew Capsule (CC) 1.1, CC 1.2 and CC2.0, including but not limited to all aspects of the pusher escape system:
 - BLUE ORIGIN’s September 19, 2009 proposal to NASA submitted in response to the Commercial Crew Development Solicitation No. JSC-CCDev-1 (the “CCDev 1 Proposal”), and BLUE ORIGIN’s Supplement 1 to the CCDev 1 Proposal submitted November 16, 2009, Supplement 2 to the CCDev 1 Proposal submitted November 18, 2009, and materials submitted to NASA pursuant to Space Act Agreement NNJ10TA2S signed by NASA on 1/30/2010 and by Blue Origin on 9 December 2009, as amended;
 - Blue Origin’s TVC development efforts conducted between (i) October 2010 and (ii) the later of the date of Blue Origin’s and NASA’s signature on this Agreement;
 - *New Shepard* Interstage;
 - *New Shepard* Propulsion Module (PM) PM1 (also known as *Goddard*), PM2, PM3 and PM4;
 - *Space Vehicle*;
 - *Reusable Booster System*, including but not limited to all aspects of the BE-3 engine, fuel and oxidizer turbopumps, injectors, thrust chamber, and all valve configurations.

APPENDIX 3: Blue Origin Proprietary Data (continued)

All patent applications filed prior to the later of the date of Blue Origin's and NASA's signature on this Agreement, including but not limited to the inventions listed in the table below:

US Patent & Trademark Office Application Number	Filing Date	Title	Primary Reference
12/885,346	September 17, 2010	Composite Structures For Aerospace Vehicles, And Associated Systems And Methods	Space Vehicle
12/704,690	February 12, 2010	Multiple-Use Rocket Engines And Associated Systems And Methods	Reusable Booster System
12/815,306	June 14, 2010	Sea Landing Of Space Launch-Vehicles And Associated Systems And Methods	Reusable Booster System
12/816,284	June 15, 2010	Predicting And Correcting Trajectories	Reusable Booster System
12/816,267	June 15, 2010	Compensating For Wind Prior To Engaging Airborne Propulsion Devices	Reusable Booster System
12/712,083	February 24, 2010	Bidirectional Control Surfaces For Use With High Speed Vehicles, And Associated Systems And Methods	Reusable Booster System
12/712,156	February 24, 2010	Launch Vehicles With Fixed And Deployable Deceleration Surfaces, And/Or Shaped Fuel Tanks, And Associated Systems And Methods	Reusable Booster System
12/815,288	June 14, 2010	Eyeball Seals For Gimbaled Rocket Engines, And Associated Systems And Methods	Reusable Booster System
61/411,274	November 8, 2010	Rocket Turbopump Valves And Associated Systems And Methods	Reusable Booster System

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SPACE ACT AGREEMENT – NNK11MS02S, AMENDMENT ONE (01)
BETWEEN
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND
BLUE ORIGIN, LLC
FOR
COMMERCIAL CREW DEVELOPMENT ROUND 2 (CCDev2)

PURPOSE AND AGENCY COMMITMENT

The purpose of this Amendment is to modify Space Act Agreement NNK11MS02S to add three unfunded milestones, which results in a modification to Article 15, Term of Agreement. Article 5.D. Quarterly Project Status Briefings is also modified to reduce the frequency of the briefings.

ARTICLE 5.D. Quarterly Project Status Briefings is revised to add the following paragraph:

For the period beginning after the quarterly briefing held in December 2012 until the end of the SAA, Blue Origin shall conduct project status briefings biannually instead of quarterly. The biannual briefings shall cover the same content as required in the quarterly briefings.

APPENDIX 2(a) Performance Milestones and Success Criteria is amended to add the following:

1. Space Vehicle Design Maturation Project

<p>Milestone 1.4 – SV Subsystem Interim Design Review Description: Hold a meeting at Blue Origin headquarters in Kent, WA to review Space Vehicle subsystem design progress with emphasis on power and actuation systems, in-space propulsion, multiplex avionics, flight mechanics and GN&C.</p> <p>Entrance Criteria:</p> <ol style="list-style-type: none">1. NASA personnel invited to participate in Interim Design Review.2. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting. <p>Success Criteria:</p> <ol style="list-style-type: none">1. Completion of the meeting.2. Provide NASA with meeting minutes summarizing the discussion.	<p>Date: March 2014 Unfunded</p>
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3. RBS Engine Risk Reduction Project

<p>Milestone 3.6 – BE-3 Engine Test</p> <p>Description: Conduct a test firing of the pump-fed engine at Blue’s West Texas Launch Site simulating a subscale booster suborbital mission duty cycle (MDC).</p> <p>Entrance Criteria:</p> <ol style="list-style-type: none">1. NASA personnel invited to observe test readiness review at WTLS. This meeting will summarize the test plan.2. NASA personnel invited to be present as witness at test.3. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting. <p>Success Criteria:</p> <ol style="list-style-type: none">1. Conduct the test for the planned full mission duty cycle.2. Provide NASA with a letter certifying that entrance criteria have been met.3. Provide NASA with a quick look report summarizing data gathered during the test.4. Provide NASA with a video of test.	<p>Date: September 2013</p> <p>Unfunded</p>
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<p>Milestone 3.7 – Subscale Propellant Tank Assembly Review</p> <p>Description: Conduct a review of the design, manufacture, and assembly of a subscale booster propellant tank at Blue Origin headquarters in Kent, WA.</p> <p>Entrance Criteria:</p> <ol style="list-style-type: none">1. NASA personnel invited to participate in Tank Assembly Review.2. At least 5 calendar days prior to meeting, delivery to NASA of slide package to be reviewed at meeting. <p>Success Criteria:</p> <ol style="list-style-type: none">1. Completion of the meeting.2. Provide NASA with meeting minutes summarizing the discussion.	<p>Date: December 2013</p> <p>Unfunded</p>
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ARTICLE 15. TERM OF AGREEMENT is amended to the following:

ARTICLE 15. TERM OF AGREEMENT

This Agreement becomes effective upon the date of the last signature below and shall remain in effect until the completion of all obligations of both Parties hereto, or May 31, 2014, whichever comes first.

ARTICLE 28. SIGNATURE BLOCK

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION

BLUE ORIGIN, LLC

BY: Philip R. McAlister
Philip McAlister
Director Commercial Spaceflight Development

BY: Robert Meyerson
Robert Meyerson
Program Manager 

DATE: 2/25/2013

DATE: 2/21/13

SPACE ACT AGREEMENT – NNK11MS02S, AMENDMENT TWO (02)
BETWEEN
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND
BLUE ORIGIN, LLC
FOR
COMMERCIAL CREW DEVELOPMENT ROUND 2 (CCDev2)

PURPOSE AND AGENCY COMMITMENT

The purpose of this Amendment is to extend the term of the agreement to allow completion of the work associated with Milestone 1.4 Space Vehicle Subsystem Interim Design Review.

Article 15 is modified as follows:

ARTICLE 15. TERM OF AGREEMENT

This Agreement becomes effective upon the date of the last signature below and shall remain in effect until the completion of all obligations of both Parties hereto, or August 31, 2014, whichever comes first.

ARTICLE 28. SIGNATURE BLOCK

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION

BLUE ORIGIN, LLC

BY: Philip R. McAlister
Philip McAlister
Director Commercial Spaceflight Development

BY: Robert Meyerson
Robert Meyerson
Program Manager

DATE: 8/16/2014

DATE: 13 May 2014

SPACE ACT AGREEMENT – N NK11MS02S, AMENDMENT THREE (03)
BETWEEN
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND
BLUE ORIGIN, LLC
FOR
COMMERCIAL CREW DEVELOPMENT ROUND 2 (CCDev2)

PURPOSE AND AGENCY COMMITMENT

The purpose of this Amendment is to extend the term of the agreement to allow completion of the work associated with Milestone 1.4 Space Vehicle Subsystem Interim Design Review.

Article 15 is modified as follows:

ARTICLE 15. TERM OF AGREEMENT

This Agreement becomes effective upon the date of the last signature below and shall remain in effect until the completion of all obligations of both Parties hereto, or October 31, 2014, whichever comes first.

ARTICLE 28. SIGNATURE BLOCK

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION

BLUE ORIGIN, LLC

BY: Philip R. McAlister
Philip McAlister
Director Commercial Spaceflight Development

BY: Robert Meyerson
Robert Meyerson
Program Manager

DATE: 8/28/2014

DATE: 8/27/14

SPACE ACT AGREEMENT – NNN11MS02S, AMENDMENT FOUR (04)
BETWEEN
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND
BLUE ORIGIN, LLC
FOR
COMMERCIAL CREW DEVELOPMENT ROUND 2 (CCDev2)

PURPOSE AND AGENCY COMMITMENT

The purpose of this Amendment is to add three unfunded milestones, which results in a modification to Article 15, Term of Agreement.

Article 15 is modified as follows:

ARTICLE 15. TERM OF AGREEMENT

This Agreement becomes effective upon the date of the last signature below and shall remain in effect until the completion of all obligations of both Parties hereto, or April 17, 2016, whichever comes first.

APPENDIX 2(a) Performance Milestones and Success Criteria is amended to add the following:

2. Pusher Escape Risk Reduction Project

<p>Milestone 2.7 – Pusher Escape In-Flight Escape Demonstration Data Review</p> <p>Description: Conduct a data review of an in-flight escape of the pusher escape system demonstration from a subscale booster during a representative suborbital mission.</p> <p>Entrance Criteria:</p> <ol style="list-style-type: none">1. NASA invited to participate in milestone review meeting.2. At least 5 calendar days prior to the milestone review meeting, delivery to NASA of slide package to be reviewed at meeting. <p>Success Criteria:</p> <ol style="list-style-type: none">1. Conduct the in-flight escape demonstration of the pusher escape system from a subscale booster.2. Provide NASA with a quick look report summarizing demonstration objectives, as well as flight and post-flight data.3. Review video of the demonstration with NASA.	<p>Date: March 2016</p> <p>Unfunded</p>
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3. RBS Engine Risk Reduction Project

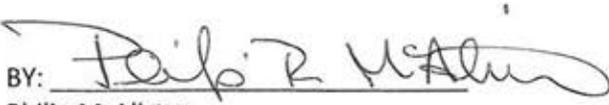
<p>Milestone 3.8 – Flight Demonstration of BE-3 Engine</p> <p>Description: Conduct a flight demonstration of the BE-3 engine on a subscale booster during a representative suborbital mission.</p> <p>Entrance Criteria:</p> <ol style="list-style-type: none">1. NASA personnel invited to a pre-flight briefing.2. NASA personnel invited to observe the flight.3. NASA personnel invited to a review of post-flight inspection results. <p>Success Criteria:</p> <ol style="list-style-type: none">1. Provide NASA with a quick look report summarizing engine operating conditions during flight.2. Review video of the flight demonstration with NASA.	<p>Date: September 2015</p> <p>Unfunded</p>
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<p>Milestone 3.9 – Flight Demo of Subscale Propellant Tank Assembly</p> <p>Description: Conduct a flight demonstration of the subscale propellant tank assembly during a representative suborbital mission.</p> <p>Entrance Criteria:</p> <ol style="list-style-type: none">1. NASA personnel invited to a pre-flight briefing.2. NASA personnel invited to observe the flight.3. NASA personnel invited to a review of post-flight inspection results. <p>Success Criteria:</p> <ol style="list-style-type: none">1. Provide NASA with a quick look report of tank operation during flight.2. Review video of the flight demonstration with NASA.	<p>Date: September 2015</p> <p>Unfunded</p>
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ARTICLE 28. SIGNATURE BLOCK

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION

BLUE ORIGIN, LLC

BY: 
Philip McAlister
Director Commercial Spaceflight Development

BY: 
Robert Meyerson
Program Manager 

DATE: 10/31/2014

DATE: 30 Oct 2014