SPACE ACT AGREEMENT AMENDMENT ONE
BETWEEN
NATIONAL AERONAUTICS AND SPACE ADMINSTRATION
AND
BLUE ORIGIN, LLC
FOR
COMMERCIAL CREW DEVELOPMENT (CCDev)

PURPOSE AND AGENCY COMMITMENT

The purpose of this Amendment is to modify Space Act Agreement NNJ10TA02S to update the Appendix 2: Performance Milestones and Success Criteria and implement such other adjustments to timing and performance as agreed-to by NASA and Blue Origin.

NASA shall provide or identify all related ARRA guidance applicable to this Agreement as provided under ARTICLE 3. RESPONSIBILITIES, paragraph A.(3), no later than the date of NASA's acceptance of Milestone A1 of APPENDIX 2, as modified herein.

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

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

ARTICLE 16. TERM OF AGREEMENT is modified to read:

> This Agreement becomes effective upon the date of the last signature below and shall expire on March 31, 2011.

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

APPENDIX 2: Performance Milestones and Success Criteria

CCDev Blue Origin Project Milestones

Pusher Escape System Maturation Plan:

Milestone A1: Project Kickoff Meeting Hold a meeting at Blue Origin facilities in Kent, WA to brief NASA personnel on project implementation plan. Agenda for the meeting:	Amount: $835,000 Date: March 2010

• Introduction
  ○ Project Scope
  ○ Relationship of Project Scope to Risk Mitigation for Blue Origin Orbital Capsule
  ○ Success Criteria
• Project Management Plan
• Current Project Status
  ○ Blue Origin Status
  ○ Subcontractor Status
• Review of Project Schedule to Completion
• Facility Tour
 	
Success Criteria: Completion of the meeting.	

Milestone A2: 1-DOF TVC Test Conduct test firing of full-scale demonstration SRM integrated with TVC system on 1-degree of freedom (DOF) thrust measurement stand. Success Criteria: Perform the test and demonstrate the ability to actuate TVC system in the presence of an exhaust plume. Record video of test and 1-DOF thrust data; recover TVC components for later analysis of erosion. Provide 'quick look report' verifying that all above success criteria have been met.	Amount: $835,000 Date: July 2010
Milestone A3: 6-DOF TVC Test Conduct test firing of full-scale demonstration SRM integrated with TVC system on 6-degree of freedom thrust measurement stand. Success Criteria: Perform the test and demonstrate the ability to actuate TVC in the presence of an exhaust plume. Record video of test and 6-DOF thrust data; recover TVC components for later analysis of erosion. Provide 'quick look report' verifying that all above success criteria have been met.	Amount: $835,000 Date: October 2010
Milestone A4: Rocket Sled Test Conduct non-separating test of full-scale CC OML and mass simulator on rocket sled track. Success Criteria: Accelerate a CC OML and mass simulator on a rocket sled track to the velocity that a later CC flight test vehicle would separate to replicate Max-Q	Amount: $0 (zero) Date: March 2011

escape control conditions. Gather video and data on sled loads and pressure distribution on CC OML and mass simulator for later use in designing the separating Max-Q escape test. Provide 'quick look report' verifying that all above success criteria have been met.	

Composite Pressure Vessel Maturation Plan:

Milestone B1: Project Kickoff Meeting
 	
Hold a meeting at Blue Origin facilities in Kent, WA to brief NASA personnel on project implementation plan. Agenda for the meeting:
 	
• Introduction
  o Project Scope
  o Relationship of Project Scope to Risk Mitigation for Blue Origin Orbital Capsule
  o Success Criteria
• Project Management Plan
• Current Project Status
  o Blue Origin Status
  o Subcontractor Status
• Review of Project Schedule to Completion
• Facility Tour
 	
Success Criteria: Completion of the meeting.
	Amount: $290,000
	
	Date: March 2010

Milestone B2: Test article composite parts received Receive all parts necessary to complete assembly of one composite pressure vessel, closing supplier risk. Success Criteria: All five major composite assemblies for the test article have passed inspection and are in Blue Origin Kent facility, ready for assembly.	Amount: $290,000 Date: May 2010
Milestone B3: Test article assembly complete Blue Origin completes assembly of the test article. Success Criteria: The structure of the test article is complete. This includes the composite pressure vessel and supporting structure on the forward and aft end,	Amount: $290,000 Date: August 2010

including machined aluminum beams and base heat shield. Mass simulators and instrumentation will not yet be installed.	

Milestone B4: Structural testing complete Blue Origin completes planned structural testing on the test article. Success Criteria: Install instrumentation and mass simulators. Complete over-pressurization testing of test article. Determine if repair necessary prior to drop test, and perform any determined to be necessary. Conduct drop test to simulate a hard landing event. Gather video, accelerometer, strain gage and pressure data necessary to assess fulfillment of test objective. Provide 'quick look report' verifying that all above success criteria have been met.	Amount: $290,000 Date: October 2010

ARTICLE 27 SIGNATURE BLOCK

The terms and conditions of Space Act Agreement NNJ10TA02S, as modified by this amendment are hereby incorporated herein

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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

DATE: 18 March 2010

BLUE ORIGIN, LLC

BY: _____
Robert Meyerson
21218 – 76th Ave South
Kent, WA 98032

DATE: 18 February 2010