

SPACE ACT AGREEMENT AMENDMENT FIVE  
BETWEEN  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AND  
SPACE EXPLORATION TECHNOLOGIES CORP.  
FOR  
COMMERCIAL ORBITAL TRANSPORTATION SERVICES DEMONSTRATION (COTS)

PURPOSE AND AGENCY COMMITMENT

The purpose of this Amendment is to modify Space Act Agreement NNJ06TA26S to add Milestones that reduce risks associated with the remaining development and timely demonstration of cargo space transportation capabilities. The additional Milestones improve the chance of mission success by (1) augmenting ground and flight testing; (2) accelerating development of enhanced cargo capabilities; or (3) further developing the ground infrastructure needed for commercial for commercial cargo capabilities.

Appendix 2 is amended to add the following:

<p><b>Milestone 23: Pressurized Cargo Environment Modal Test Plan and Setup</b></p> <p>SpaceX shall prepare a Test Plan and Procedure for a pressurized cargo environment modal test using a flight like Dragon structure and sample manifest of cargo simulators, as needed. The required test facilities, test equipment, and a flight like Dragon Structure shall be prepared as appropriate and agreed to with NASA.</p> <p>Entrance Criteria:</p> <ul style="list-style-type: none"><li>• Develop the primary and secondary structures to be tested</li><li>• Test Plan (series) defined including objectives and risks, agreed to by NASA</li><li>• Test procedures released and under configuration control</li><li>• Ground and data acquisition systems ready to support test</li></ul> <p>Success Criteria:</p> <ul style="list-style-type: none"><li>▪ Hardware and Test equipment available or on schedule for test</li><li>• Test Plan agreed to by NASA</li><li>• Test Procedure released and provided to NASA</li></ul>	<p>Amount \$5,000,000 Date: November 2010</p>
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**Milestone 24: Pressurized Cargo Environment Modal Test**

SpaceX shall conduct a pressurized cargo environment modal test using a flight like Dragon structure and sample manifest of cargo simulators, as needed. The Test shall collect critical data to allow development of a test correlated Dragon model. Test results will be provided to NASA.

Entrance Criteria:

- Hardware and Test equipment available or on schedule for test
- Test Plan agreed to by NASA
- Test Procedure released and provided to NASA

Success Criteria:

- All defined tests completed
- Test data recorded, archived and made available to NASA
- Conduct Quick-look Post-test Review of test data and anomalies (2 days after completion of testing)

Amount \$5,000,000  
Date: December 2010

**Milestone 25: LIDAR Sensors 6 Degree of Freedom Testing (open loop)**

SpaceX shall fabricate a flight-like Dragon LIDAR and install in a simulated sensor bay with representative sensor field of view and conduct testing of the systems at a 6 Degree Of Freedom (DOF) test facility to characterize the systems performance over a wide range of angles of attack and lighting conditions in an open loop control configuration. The Parties agree that the data/items furnished by SpaceX in this LIDAR testing shall not be considered "Proprietary Data" as that term is defined in Article 12.

Entrance Criteria:

- DragonEye LIDAR installed on test stand in a simulated Dragon sensor bay configuration and ready for test
- Test Plan/ Procedure reviewed by NASA and released
- Acceptable ranges for key performance parameters defined
- Data acquisition system tested and ready to support test
- Data and analysis to be provided to NASA defined and agreed

Success Criteria:

- All defined tests completed
- Test data recorded and archived
- Conduct Quick-look Post-test Review of test data and anomalies (2 days after completion of testing)
- Provide all planned data and analysis 30 days after test completion

Amount \$5,000,000  
Date: December 2010

**Milestone 26: Solar Array Deployment & Component Thermal Vacuum Tests**

SpaceX shall perform testing of critical components and subsystems of Dragon Solar Array Deployment mechanism (spring/damper & hinge/latch mechanisms) in a Thermal Vacuum Chamber. SpaceX shall conduct a deployment test of the solar array system in atmosphere.

**Entrance Criteria:**

- Develop a list of components and subsystems to be tested, agreed to by NASA
- Test Plan (series) defined including objectives and risks
- Test procedures released and under configuration control
- Ground and data acquisition systems ready to support test

**Success Criteria:**

- All defined tests completed
- Test data recorded and archived
- Conduct Quick-look Post-test Review of test data and anomalies (2 days after completion of testing)

Amount \$5,000,000  
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ARTICLE 28. SIGNATURE BLOCK

The terms and conditions of SAA NNJ06TA26S, as modified by this Amendment, are hereby incorporated herein.

NATIONAL AERONAUTICS AND  
SPACE ADMINISTRATION

SPACE EXPLORATION  
TECHNOLOGIES CORP.

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Date: 12/4/2010

Date: 11/16/10