

SPACE ACT AGREEMENT AMENDMENT SIX
BETWEEN
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
AND
ORBITAL SCIENCES CORPORATION
FOR
COMMERCIAL ORBITAL TRANSPORTATION SERVICES DEMONSTRATION
(COTS)

PURPOSE AND AGENCY COMMITMENT

The purpose of this Amendment is to modify Space Act Agreement (SAA) NNJ08TA32S to add two (2) additional Milestones (numbers 23 through 24) to Appendix 2. The purpose of these new milestones is to lead towards a potential additional test launch of the Orbital Sciences Taurus II launch vehicle prior to the system demonstration mission to the International Space Station. A Taurus II maiden test launch would reduce risks associated with the development of a new launch vehicle and increase the chance of success of the system demonstration mission with the Orbital Sciences Cygnus Spacecraft.

In accordance with Article 5 – FINANCIAL OBLIGATIONS of the Space Act Agreement, the Government’s liability to make payments to ORBITAL is limited to only those funds obligated annually under this Agreement or by amendment to this Agreement, and NASA may obligate funds to this Agreement incrementally. Therefore the Parties agree there is no commitment or obligation to conduct an additional test launch of the Taurus II launch vehicle.

Appendix 2 is amended as follows:

The following milestones are added to the SAA.

<p>Milestone 23: Taurus II Maiden Flight Preliminary Mission Analysis</p> <p>Orbital shall develop a Preliminary Mission Analysis defining the trajectory and the overall mission plan.</p> <p>This analysis is prepared using the best available mission requirements to identify any potential problems inherent in accomplishing the mission objectives.</p> <p>Success Criteria: Orbital shall conduct a detailed review of the analysis in the form of a walkthrough of the analysis report. .</p>	<p>Amount: \$10,000,000 Date: February 2011</p>
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The preliminary mission analysis shall include, as a minimum:

- a. The nominal and 3-sigma limits for orbit elements
- b. Mission Unique Requirements
- c. Performance capability, margins and reserves
- d. Sequence of events and tracking coverage
- e. Time history of trajectory from launch to targeted condition
- f. Launch vehicle summary weight statement
- g. Sources and magnitude for all dispersions used. If statistical dispersions are used, then the distribution method (e.g., normal, Gaussian) shall be specified for each parameter
- h. Definition of all coordinate systems used
- i. Reference to the source(s) for all payload inputs to this analysis (e.g., requirements, mass properties)

Milestone 24: Design Review of Cygnus Mass Simulator

Orbital shall conduct a Design Review for the Cygnus mass simulator to be flown on the Taurus II Maiden Flight.

Success Criteria: Successful completion of the Design Review in accordance with the CDR criteria defined in Appendix 3 of the Orbital COTS SAA, tailored by mutual agreement between NASA and Orbital.

Amount: \$10,000,000
Date: March 2011

ARTICLE 28. SIGNATURE BLOCK

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

NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION

BY: Douglas R. Cooke
Douglas R. Cooke
Associate Administrator,
Exploration Systems Mission Directorate

DATE: 2/14/2011

ORBITAL SCIENCES CORPORATION

BY: Antonio L. Elias
Dr. Antonio L. Elias
Executive Vice President and General
Manager, Advanced Programs Group

DATE: 25 JAN 2011

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