

SPACE ACT AGREEMENT AMENDMENT THREE
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 the terms and conditions of Space Act Agreement No. NNJ08TA32S to identify certain equipment that will be loaned by NASA to enable accomplishment of the COTS system development and execution of the demonstration flight, and to clarify the COTS technical approach described in Appendix 1.

Appendices 1 and 4 are modified as follows:

Appendix 1 – Section I.E3 COTS Technical Approach

The first paragraph is replaced in its entirety with the following (underlines added to indicate changes):

Our COTS technical approach parallels the two distinct phases of NASA's COTS program. During the demonstration phase (2008-2011), Orbital will develop and qualify a new, lower-cost medium launch vehicle; design, manufacture, qualify and integrate the Cygnus visiting vehicle including a service module and a protoflight Pressurized Cargo Module (PCM) which is procured by Orbital under a Commercial Resupply Services (CRS) subcontract with Thales-Alenia; and establish ground infrastructure and mission operations capabilities. Working closely with NASA, Orbital will also develop the essential human spaceflight safety practices and cost-disciplined commercial protocols in this phase, to support future COTS operational missions. The culmination of this phase will occur in 2011 with the COTS demonstration flight to ISS where we will demonstrate the rendezvous, proximity operations, SSRMS capture, and berthing at ISS. Building on the results of this initial phase, Orbital will be able to provide operational CRS missions to ISS in the follow-on service phase, with the first such mission planned to take place in 2012.

Appendix 4 – NASA Equipment Loaned to Orbital

The following items are deleted:

3) Up to four (4) single and double middeck stowage lockers (flight unit or development unit) to support performance of a cargo accommodation demonstration.	Return date: Not later than 2 months following completion of the Orbital COTS Demonstration flight.
4) Powered cargo and powered cargo ground support equipment required to verify the interfaces between the cargo and Cygnus.	Return date: Not later than 2 months following completion of the Orbital COTS Demonstration flight.

Item numbers 5 and 6 are renumbered to 3 and 4 as follows:

3) Berthing Mechanisms or components, including test equipment needed to verify the interface.	Return date: Not later than 2 months following completion of the Orbital COTS Demonstration flight.
4) Ground and flight cables to test interfaces between the Cygnus and ISS hardware and/or simulators.	Return date: Not later than 2 months following completion of the - Orbital COTS Demonstration flight.

The following items are added:

5) Restraints and Mobility Aids	Return date: For the Orbital COTS Demonstration flight, this item will be loaned on-orbit and returned on-orbit.
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Appendix 5 is added as follows:

Appendix 5 : Government Furnished Equipment to Orbital

1) IVA and EVA Labels.
2) Rendezvous and Proximity Operations Target, including as a minimum, a Common Berthing Camera System (CBCS) target.
3) Smoke detector laser diodes

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

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DATE: 4/22/2010

ORBITAL SCIENCES CORPORATION

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DATE: 8 APRIL 2010