



Capturing defective satellites in space – DLR awards contract to Astrium

13 September 2012

A service satellite captures an uncontrollable satellite in space, repairs or refuels it and, at the end of the mission, ensures that the defective satellite is disposed of in a controlled manner. Something that sounds like science fiction is now a step closer to reality. The German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) Space Administration has awarded Astrium GmbH the overall system management contract for the mission preparation phase of the 'Deutsche Orbitale Servicing Mission', DEOS.

Gerd Gruppe, DLR Executive Board Member for the Space Administration, and Eckard Settelmeyer, Director of the Astrium facility at Friedrichshafen, signed the DEOS agreement on 13 September 2012 at the ILA Berlin Air Show. The space company has been awarded the contract for systems responsibility in the preparatory mission and product definition (design) phase. The contract has a duration of one year and a gross value of 15 million Euros. Principal responsibility at Astrium lies with the satellites business unit in Friedrichshafen and the space transportation division in Bremen. DLR Space Operations and the DLR Robotics and Mechatronics Center in Oberpfaffenhofen are among the seven subcontractors. The design phase is the final step before construction of the hardware can begin.

"Providing services in space is only possible through the use of space robotics. The performance level of modern robots is comparable to the capabilities of an astronaut in a space suit. The DEOS mission is expected to put this to the test for the first time – as a national technology verification for the maintenance and targeted return of defunct satellites from low Earth orbit," Gerd Gruppe said at ILA. "We also want to use DEOS to prepare for the introduction of sustainable orbital infrastructures. This focuses on efficient methods of teleoperation and controlling a satellite's automated processes," Gruppe added, explaining the potential of the DEOS mission.

The background to this mission is the growing number of satellites in space; this increases the risk of collisions. Impacts with uncontrollable spacecraft can no longer be ruled out with any degree of certainty. But there has long been an absence of solutions for recovering stricken satellites from crowded orbits, and DEOS is expected to fill this gap. The aim is to create an operational on-orbit servicing system. In addition to performing inspection and maintenance, such a system will then be used for eliminating space debris by disposing of satellites in a controlled manner at the end of their service life.

DEOS will test and qualify the technologies and capabilities required for this under real space conditions, from locating and approaching a satellite to capturing and manipulating it in a non-destructive manner and then controlled disposal. To do this, two satellites – one 'servicer' and one 'client' – will be launched together into low Earth orbit, then separated from one another. Then, a comprehensive experiment and verification programme will follow before the satellite pair re-enters Earth's atmosphere and burns up.

DEOS is being implemented by the DLR Space Administration, with funds from the German Federal Ministry for Economics and Technology (Bundesministerium für Wirtschaft und Technologie; BMWi).

DEOS

The DEOS mission will see a servicing satellite capturing a tumbling 'uncooperative' satellite in a non-destructive manner; the coupled satellite pair will subsequently be disposed of. This will be done through a targeted injection into a previously determined re-entry corridor, where both satellites will burn up.

Contacts

Elisabeth Mittelbach
German Aerospace Center (DLR)
Communications, Space Administration
Tel.: +49 228 447-385
Fax: +49 228 447-386
Elisabeth.Mittelbach@dlr.de

Detlef Reintsema
German Aerospace Center (DLR)
DLR Space Administration, General Technologies and Robotics
Tel.: +49 228 447-515
Fax: +49 228 447-718
Detlef.Reintsema@dlr.de

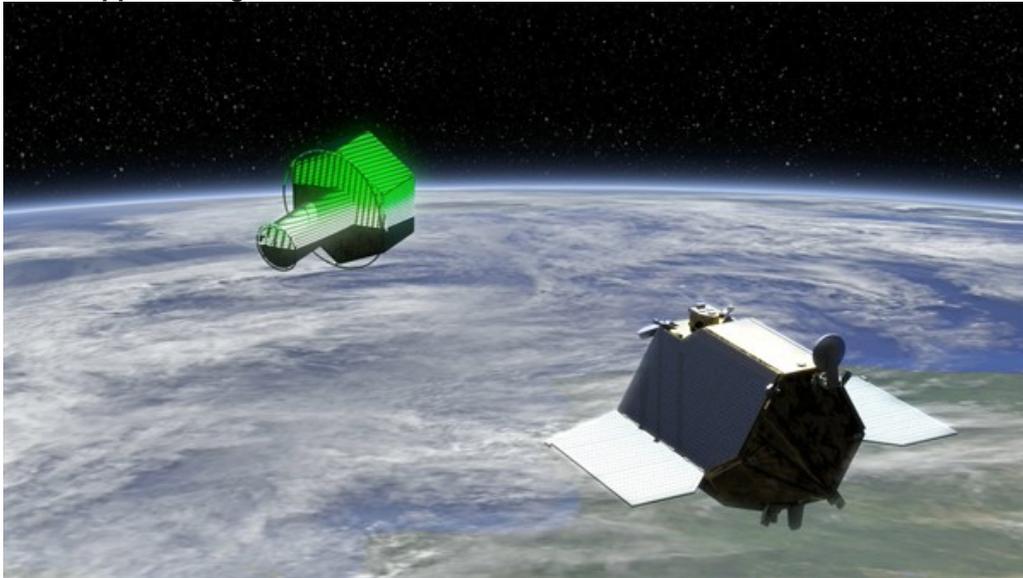
Contract signature – DLR awards contract to Astrium for orbital servicing mission



The German Aerospace Center's Space Administration has awarded Astrium GmbH the overall system management contract for the mission preparation phase of the Deutsche Orbitale Servicing Mission, DEOS. The contract was signed on 13 September 2012 at the ILA Berlin Air Show. From left to right: Christoph Hohage, Project Director, DLR Space Administration; Gerd Gruppe, DLR Executive Board Member for Space Administration; Eckard Settelmeyer, Astrium; Michael Menking, Astrium.

Credit: DLR (CC-BY 3.0).

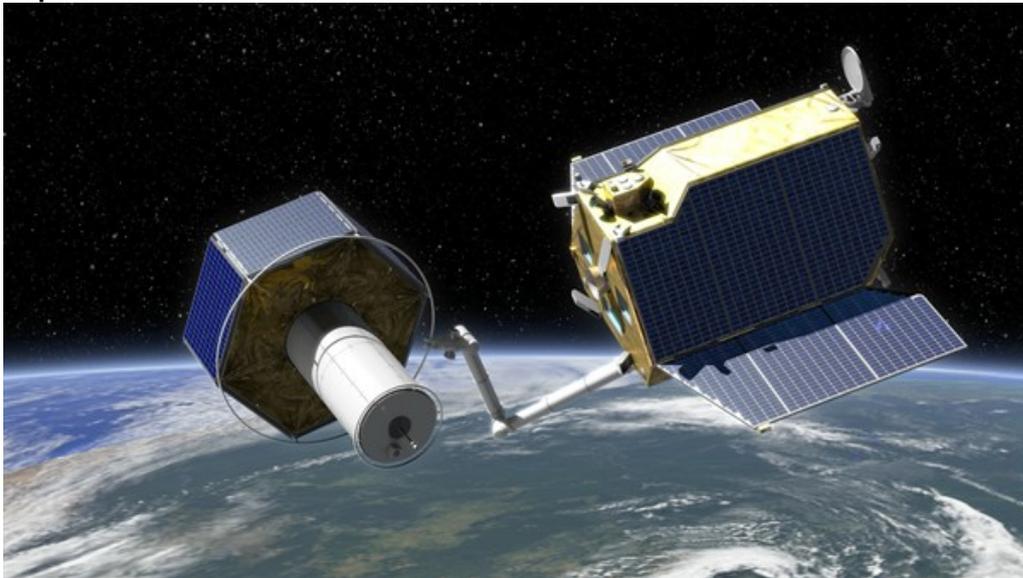
DEOS approaching a satellite



The DEOS satellite approaches a defective satellite detected with its sensors...

Credit: Astrium GmbH.

Capture of the satellite



... the servicing satellite's grip extends, captures the defective satellite and repairs it.

Credit: Astrium GmbH.

The satellite pair burns up



If no repair is possible, the satellite pair burns up in Earth's atmosphere.

Credit: Astrium GmbH.

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