

ESA Commissions World's first Space Debris Removal Contract

As ESA's General Director (DG) Jan Woerner mentioned in his annual press conference on January 11, 2021 ESA to develop a commercial market with industry, awarding contracts for certain tasks.

On Tuesday, 1 December 2020 ESA has signed an €86 million contract with an industrial team led by the Swiss start-up ClearSpace SA to purchase a unique service: the first removal of an item of space debris from orbit. As a result, in 2025, ClearSpace SA will launch the first active debris removal mission, ClearSpace-1, which will rendezvous, capture and bring down for reentry a Vespa payload adapter [1].

With this contract signature, a critical milestone for a new commercial sector in space was established.

The mission is supported within ESA's Space Safety program "pillar" based at the agency's ESOC operations center in Darmstadt, Germany.



ESA's four Programmatic Pillars



Image shared by Carolina Fioratti (LinkedIn)

SpaceOps (SoN) had the opportunity to conduct an e-mail Interview at this early stage of the contract with ClearSpace representatives:

1. What is the difference of this commercial service contract to a regular ESA contract with respect to management and responsibilities?

The service contract allows for a light weight approach to ESA missions. In the ADRIOS [2] contract ESA is a customer for a deorbiting service.

2. What assets would you own and produce "in-house"?

ClearSpace will focus its developments on deep neural network based navigation, low cost sensors, space robotics and capture system. ClearSpace will own the design of the spacecraft and ground segment.

3. ESA acting as customer means Clear Space has to take some financial risks. How would you safeguard against catastrophic events?

We do not comment on financial dispositions.

4. What role would the recent project DEOS [3] developments play in the further developments?

DEOS does not play a direct role in the ADRIOS mission. The use of low cost robotic arms has a potential for in orbit servicing in the future.

5. Will there be co-operations with other institutions working on the "debris-removal" problem or related issues?

ClearSpace does already collaborate with other institutions around debris removal and space traffic management.

6. What are your long term visions for continuation of debris removal?

Our objective is to reduce the costs of in-orbit servicing and active debris removal. We believe that this is a critical step toward sustainable space operations.

Thank you very much for the open information during the early stages of your enterprise. We will be following your progress and wish you a complete success in all aspects – what ClearSpace is doing matters very much!

References:

[1] Contract Signature:

https://www.esa.int/Newsroom/Press_Releases/Call_for_Media_ESA_and_ClearSpace_SA_sign_contract_for_world_s_first_debris_removal_mission

[2] **ADRIOS** (Active Debris Removal / In-Orbit Servicing) In December 2019, the European Space Agency assigned the first ADRIOS mission to ClearSpace, a startup created by a team of researchers from the Ecole Polytechnique Fédérale de Lausanne (EPFL). The project that is being assessed will involve Portuguese companies

[3] **DEOS** (Deutsche Orbitale Servicing Mission) was a mission to practice how to complete maintenance tasks – refuelling in particular – that extend the service life of satellites. DEOS consisted of two satellites, a ‘client’ and a ‘servicer’. The client acts as the satellite requiring maintenance or disposal. The servicer carries out the necessary work on the client.

The DEOS project was to be also for the first time demonstrate technologies for the controlled in-orbit disposal of a defective satellite.

DLR Space Administration announced in September 2012, that Astrium Friedrichshafen was selected as the prime contractor for the definition phase of the DEOS.

The two satellites were to be launched together and brought into orbit at a height of 550 kilometers. According to planning, DEOS was to be ready for launch in 2018, but the project was cancelled after the definition phase [Gunter’s Space Page: https://space.skyrocket.de/doc_sdat/deos.htm]

[3a] See related technical article: End-to-End Simulation of On-Orbit-Servicing:

<https://arc.aiaa.org/doi/10.2514/6.2018-2457>

Additional Info:

https://www.esa.int/Safety_Security/Clean_Space/ESA_commissions_world_s_first_space_debris_removal.

Company home page <https://clearspace.today/> e-mail: media@clearspace.today