

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Future Space Transportation Systems (4)

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DREAM CHASER FOR EUROPEAN UTILIZATION (DC4EU): ESA PILOT PHASE RESULTS

Abstract

In 2015 ESA launched an ongoing initiative for strategic partnerships with the private sector, leveraging ideas for advancing the implementation of ESA's space exploration strategy. A strong focus is placed on the commercial dimension of ISS utilization, post-ISS low Earth orbit exploitation and lunar exploration. In the frame of this initiative, the Dream Chaser for European Utilization (DC4EU) has been selected by ESA for the implementation of a pilot phase.

This partnership aims to establish a European on-demand low Earth orbit (LEO) operational capability using the Dream Chaser® Space Utility Vehicle developed by Sierra Nevada Corporation (SNC), a US company awarded with a NASA Commercial Resupply Services (CRS2) contract in 2016. The DC4EU service plans to offer an affordable and flexible platform for user-driven European research and technology demonstration opportunities in space.

The main goals of the DC4EU service are to offer:

- first class research facilities for science opportunities remain, even after the International Space Station (ISS) is decommissioned,

- flight application of developed European transportation technologies (e.g. docking/berthing adapter, operational software, active debris removal, thermal protections, rendezvous and re-entry guidance navigation control, etc.) and capabilities (launch and landing) and
- new technology validation in relevant environment (robotics, grappling, etc.) and generate spin-off to other areas of space activities (space exploration, in-orbit servicing, assembly in space, etc.).

This paper aims to present the main results of the DC4EU pilot phase, covering a technical and programmatic feasibility assessment of the DC4EU service, description of a representative mission in LEO, the evaluation of different user scenarios and an analysis of the resources available for payloads, in terms of mass, power and communication.