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

Author: Dr. Marco Berg
OHB System, Germany

Ms. Andrea Jaime
OHB System AG - Munich, Germany
Mrs. Antonella Sgambati
OHB System AG-Bremen, Germany
Dr. Timo Stuffler
OHB System AG - Munich, Germany
Mr. John Roth
Sierra Space, United States
Dr. Luciano Saccani
Sierra Space, United States
Ms. Kathy Benzin
Sierra Space, United States
Mr. Neeraj Gupta
Sierra Space, United States
Dr. dario castagnolo
Telespazio, Italy
Mr. Franco di Stadio
Telespazio S.p.A., Italy
Mr. Bernhard Hufenbach
European Space Agency (ESA), The Netherlands
Mr. Marco Caporicci
European Space Agency (ESA), The Netherlands

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 Utlitization (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.