

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Upper Stages, Space Transfer, Entry and Landing Systems (3)

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NASA AND ESA PARTNERSHIP ON THE MULTI-PURPOSE CREW VEHICLE SERVICE MODULE

Abstract

Following the decisions at the ESA Council in March 2011 a joint ESA - NASA working group was established to analyse the feasibility of Europe to provide the Service Module (SM) of the NASA Multi Purpose Crew Vehicle (MPCV) based on a derivative of Europe's ATV. This working group was established by ESA and NASA with industrial support from Astrium, TAS-I and Lockheed-Martin.

Following the approval of the ISS Exploitation Declaration for the ISS lifetime extension until end 2020, it was decided to offset the European obligations to the ISS Program with different means, following the ATV-5 mission foreseen in mid 2014. The identified alternative approach is based on a barter element that would generate cost avoidance on the NASA side. NASA and ESA considered a number of barter options, and concluded that the provision by ESA of the SM for MPCV was the sole barter element of interest to NASA.

The MPCV is the spacecraft that NASA intends to use to send humans and cargo into space beyond low earth orbit. The first two exploration missions consider an unmanned lunar fly-around mission end of 2017 as well as manned lunar circular orbit mission end of 2019.

An ESA provided SM would make use of Europe human space flight development heritage using European systems. Major functionalities of the SM in support of the crew module are propulsive support, fuel storage, power generation and distribution, thermal control and consumable storage. To facilitate a potential utilization in European missions the SM will have a modular configuration and will be compatible with an Ariane 5 launch.

Following successful completion of the feasibility working group, NASA Associate Administrator for Human Exploration and Operations and ESA Director General signed a "Framework between NASA and ESA Concerning Follow-on Activities required for decisions to be taken in 2012 for the 2016 through 2020 ISS Common Operation Costs (CSOC) Barter." Both Agencies agreed to extend the assessment of the cooperation in order to achieve technical and programmatic maturity necessary for the decision to be taken by the ESA Council at Ministerial level to be held in November 2012. ESA and NASA have continued with the MPCV-SM phase A/B1 activities including System Requirement Review and System Design Review milestones in 2012.

The proposed paper will give an overview of the results of the on-going study as well as of its perspective utilization for the global space exploration endeavour.