SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 3 (2C)

Author: Mr. Friedhelm Claasen
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany, friedhelm.claasen@dlr.de

Mr. Norbert Henn
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany, norbert.henn@dlr.de
Mrs. Britta Schade
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany, Britta.Schade@dlr.de
Mr. Volker Schmid
Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany, Volker.Schmid@dlr.de

THE GERMAN SPACE AGENCY'S MOON EXPLORATION ACTIVITIES

Abstract

The German Space Agency's exploration efforts continue with a focus primarily on the Moon. The ESA Lunar Lander activities are strongly supported as they are fully in line with our national strategic approach to realize a small Lunar Lander as a technical precursor demonstration mission, e.g. for an autonomous soft precision landing and hazard detection and avoidance (GNC&HDA), carrying some science, too. The inclusion of a Mobile Payload Element (MPE) would also be of great interest. This MPE could be a small robotic technology platform to demonstrate e.g. soil sample collection and delivery to the Lander Module. DLR undertakes preparatory work to provide this MPE as a national contribution payload. Because of the importance of GNC&HDA a feasibility study for a terrestrial Lander Demonstrator has been done within the National Program in 2009/10. Dedicated technologies need further development effort to be available in due time.

Besides that DLR strongly supports a wider scale of exploration preparation: The prolonged ISS Utilisation throughout 2020 provides the opportunity to use ISS as stepping stone for exploration and as test bed for related developments. The Advanced Re-entry Vehicle (ARV) could provide a variety of transport capabilities for Europe, first to enhance ISS utilisation, later to support exploration missions to Moon and beyond. ARV can be seen as one of the European building blocks for exploration. Some instrument developments/contributions for international exploration missions are under discussion in Germany. Dedicated technology studies for e.g. life support and energy systems as well as in-situ resource utilisation are continued. Automation and robotics studies contribute to the development of critical technologies and the raising of their technology readiness levels.

With regard to international exploration activities, DLR plays an active role within the International Space Exploration Coordination Group, is ready to provide assets as a member of the International Lunar Network, and applied for an affiliate membership with the NASA Lunar Science Institute.

The actual reorientation of NASA along the presidential budget proposal and the international reactions seem to stimulate for a more intense cooperation among the community of space faring nations. DLR is ready to participate in a responsible and visible role. Robotic precursor missions will prepare for human spaceflight beyond ISS and low Earth orbit.

The paper will provide the actual status, results and the programmatic orientation of the ongoing German Space Agency's exploration activities with a focus on the Moon.