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Author: Mr. Yury Makushenko
S.P. Korolev Rocket and Space Corporation Energia, Russian Federation

Dr. Rafail Murtazin
Rocket Space Corporation Energia, Russian Federation

Dr. Alexander G. Derechin
S.P. Korolev Rocket and Space Corporation Energia, Russian Federation

Mr. Dmitry Zarubin
S.P. Korolev Rocket and Space Corporation Energia, Russian Federation

THE CISLUNAR SPACEPORT: AN EFFECTIVE APPROACH FOR THE CREW DELIVERY TO
THE LUNAR SURFACE

Abstract

Nearly half a century passed after the successful implementation of the Apollo program that brought astronauts to the lunar surface. Today a number of space agencies are considering substantial return to the Moon with the deployment of the lunar surface base enabling long-term crew presence. Such an ambitious objective requires maximum efficiency of the transportation operations.

For the Apollo program one-launch scheme with Saturn 5 super-heavy launch vehicle was used. The same scheme was planned for the Soviet lunar program. All elements of the Lunar Expeditionary Complex were expendable and the maximum stay period on the lunar surface did not exceed 3 days. From today's point of view such an approach is very expensive and inefficient.

At the present time a concept of the Spaceport located on high-elliptical lunar orbit is being widely discussed. The Spaceport could be deployed by ISS-partners taking into account the existing positive experience. The Spaceport is considered to be a transportation hub supporting deep space exploration programs: missions to the Moon, asteroids, Mars and other natural and artificial objects.

Different schemes of crew delivery to the lunar surface using Lunar Lander based and serviced at the Spaceport are compared in the paper. The Spaceport utilization significantly reduces transportation operations time limits and provides conditions for reusable lunar spacecraft implementation. Lunar Expeditionary Complex assembly can be carried out by multi-launch schemes of heavy-class launch vehicles. It will provide effective solutions for future lunar base program.