

Lunar Exploration (2)
Lunar Exploration (1) (1)

Author: Mr. Andrzej Kotarski
Polish Astronautical Society, Poland, andrzej.kotarski@gmail.com

ORBITAL INFRASTRUCTURE AS A FACTOR IN ENSURING THE CONTINUITY OF REMOTE
MINING OPERATIONS ON THE LUNAR SURFACE

Abstract

The Moon is a goal of planned missions for the space agencies of the United States, China, India and Japan, and the European Union and Russia. In these programs, as well as under privately supported programs, it is planned to conduct unmanned technical demonstration missions for the exploitation of local resources for mission needs. This is an introduction to securing mission needs with the duration of stay on or under its surface. A key resource of interest is water, which can be used in life management systems or as a propellant or raw material for its production. The factor that changes the nature of man's stay on the Moon from short-term to long-term or permanent is the use of its resources on an industrial scale for these needs. The key element enabling this is an adequate orbital infrastructure that will ensure the operation of the extraction of the Moon's resources in a continuous mode and their global reach. The simulations of two scenarios of operations on the Moon without orbital infrastructure and with its use show a significant increase in the operational capabilities of units operating on its surface and orbit and an increase in their range when used. An important element is conducting these operations in real time and obtaining their global reach. In the light of the results of the simulations of the scenarios of mining operations on the moon with and without the orbital infrastructure, it appears that it is a key element opening up their conduct in real time and on a global scale.