HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Astronaut Training, Accommodation, and Operations in Space (5)

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THE STUDY OF TOPICAL ISSUES RELATED TO THE FEATURES OF THE MOON EXPEDITIONS ACTIVITY

Abstract

The Russian conception of manned space exploration for the period till 2050 provides for the moon exploration as a major strategic objective. Flying to the Moon will enable maturing the technologies of interplanetary missions to Mars and other bodies of the solar system. Regular building of habitable (visited) laboratories and corresponding infrastructure on the lunar surface will open a new era of space exploration. It is expected that lunar missions will be performed according to the scheme of separate delivery of manned spacecraft and a takeoff-and-landing complex into circumlunar orbit with their subsequent docking. The landing of the 2-4-person crews in the vicinity of a lunar base will be carried out using a takeoff-and-landing complex. Activity of a crew on the lunar surface will be supported by the lunar base infrastructure (including transport means). The main tasks of lunar expeditions will be as follows: applied research, installation and maintenance of complex scientific equipment, geological investigations in the interests of future moon exploration, maturing of engineering solutions and technologies of long-duration stay and work of humans on the surface of celestial bodies for the benefit of human Mars exploration. Practice of manned space exploration shows that an adopted model of crew activity has the decisive importance in determining the ergonomic requirements, requirements for information support, ensuring of safety when designing and operating MSV and organizing and planning activity of a crew aboard manned spacecraft as well as in developing the concept of cosmonaut selection and training. Currently, issues of developing the structure and content of the standard activity model for lunar expeditions are not sufficiently tackled. That's why, it seems urgent to carry out anticipatory study of challenging features of human activity on the lunar surface for various scripts of missions to the Moon and its exploration. The paper presents investigation findings of the structure and content of the standard model of lunar expeditions' activity and substantiates a number of challenging issues that require further research.