IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Commercial Human Spaceflight Programs (2)

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THE INTERACTION OF INDUSTRY AND SCIENCE IN ANALOG AND ON-BOARD EXPERIMENTS AS A POTENTIAL FOR CREATING COMMERCIAL INNOVATIONS

Abstract

A necessary condition for the development of the space industry is the emergence of technical and technological as well as organizational innovations. The expansion of the technics tasks during space exploration requires a constant and sufficiently rapid renewal. The space industry enterprises are interested in finding and implementing modern technical solutions both for improving existing equipment and for creating a new one. It is obvious that technical tests can‘t give an exhaustive answer to the question of how the tested equipment will behave in interaction with the crew. That is why long-term, full-fledged tests should be conducted on Earth. Isolation studies simulating long space flights allow such tests to be carried out in close interaction of science and technology, providing prompt feedback for developers. It is possible to test both scientific and medical equipment, including during simultaneous use, the assessment of the ergonomics of spacecraft cabins, as well as the development of organizational mechanisms for interaction between scientific organizations and industrial enterprises. One of the effective mechanisms for such interaction is to sign framework agreements on cooperation, both between organizations representing one state and international agreements.

The successful performance of isolation studies for more than 30 years (experiments HUBES, ECOPSY, SFINCSS, Mars-500, Moon-2015, etc.) allowed to start a series of experiments "Sirius" organized by the Institute of Biomedical Problems under the auspices of the State Space Corporation Roscosmos jointly with the Human Research Program (NASA) in close cooperation with the Gagarin Cosmonaut Training Center and the Rocket and Space Corporation Energia. The project SIRIUS is a unique opportunity to use a scientific resource for industrial enterprises, including commercial organizations. Moreover, business representatives can act both as a customer and as a contractor, sponsor or partner.

Commercial entities can also participate in scientific research onboard the ISS. Thus, the biothechnological company 3D Bioprinting Solutions performed space experiment on the cultivation of living tissues and organs in microgravity. Such experiments opens up opportunities for creating innovations and occupy new niche in the field of biomedicine and transplantology, as well as the pharmaceutical industry.

It is evident that the developments created as a results of such projects will also contribute to the improving of technology and technologies for further human space exploration, including commercial flights.