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INNOVATIVE SOLUTIONS FOR DESIGNING A TRAINING SIMULATOR FOR VISUAL INSTRUMENTAL OBSERVATIONS FROM THE ISS

Abstract

Visual instrumental observation (VIO) from the ISS is one of the most informative methods of Earth's remote sensing used in manned space exploration. In accordance with the conceptual issues of Development Roadmap of Russian Manned Cosmonautics up to 2023, further study of the Earth's surface, exploration of the Moon, observations of various processes and phenomena, both on the Earth and on the lunar surface, are envisaged. So these issues entail increased requirements for the training of cosmonauts in this area of activity at all stages of basic training for space flights. Yu.A. Gagarin ResearchTest Cosmonaut Training Center has developed a unique method of training cosmonauts for performing VIOs, which is a training process focused on the cosmonauts' mastering the theoretical foundations of experimental research on topical problems of Earth sciences, studying the physical features of territories, and acquiring the necessary skills and abilities to detect the observed objects as well as to use onboard remote sensing equipment. The "Trenazhor VIN" simulator created at Yu.A. Gagarin ResearchTest Cosmonaut Training Center is intended for the training relating to geophysical research and Earth monitoring from the ISS RS; it allows to simulate the entire process of preparation for the implementation of VIOs and has no analogues. The simulator is based on innovative solutions that take into account the specific features and conditions of performing VIOs from the ISS, the characteristics of used scientific equipment, as well as the experience gained in training cosmonauts for this type of activity. The operator's workplace enables not only to mount scientific equipment on it, but also provides the necessary conditions for setting up this equipment when sighting observed objects. The use of "Trenazhor VIN" simulator in training cosmonauts for VIO-related space experiments improved the quality of cosmonaut training experience in this area.