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Author: Dr. Igor V. Sorokin
S.P. Korolev Rocket and Space Corporation Energia, Russian Federation

Mr. Alexander Kalery
S.P. Korolev Rocket and Space Corporation Energia, Russian Federation

THE ISS NAUKA MODULE: COMMISSIONING PHASE AND BEGINNING OF UTILIZATION

Abstract

The Multipurpose Laboratory Module (MLM) Nauka ("Science" in English) became a part of the Russian segment (RS) of the International Space Station (ISS) on 29 July 2021. During preflight preparation of the module at Baikonur cosmodrome MLM was equipped with a certain number of multipurpose workstations and their elements, special facilities, and equipment to support the in-flight testing, maintenance, and use of payloads. MLM has been also equipped with additional systems and facilities in orbit, after the docking with the ISS, both inside of its pressurized compartments and on the external surface, during several sessions of extravehicular activity that were performed by Russian crewmembers in 2022. Among these additional facilities and systems are the Lock chamber, the European robotic arm (ERA), additional external radiator of the temperature control system (that were stored at the ISS within 10 years), and others. Also, a number of the facilities and instruments were delivered onboard Progress-MS cargo transportation vehicles. After assembly, integration, and putting into operation of new facilities and structures, all of them were tested in orbit (during the commissioning phase) to confirm their operability. Upon completion of this process the module's nominal utilization has been started. This paper describes and analyses the results of the MLM commissioning phase, its operational readiness to proceed with the scientific experiments approved in the "Long-Term Dedicated Research Program onboard the ISS RS until 2024", and considers the first results of MLM utilization in space.