

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Utilization & Exploitation of Human Spaceflight Systems (3)

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RESEARCH POTENTIAL OF THE ISS'S NAUKA MODULE

Abstract

A key feature of the ISS RS's construction and utilization process is a consecutive application of the exchangeable payloads method on the segment's modules, directed towards efficient utilization of research facilities installed on board. The method is based on a concept of the multipurpose workstations, integrated both in the pressurized compartments, and outside the modules. Advanced multipurpose workstations, supporting frames of different design, "base points" of the European robotic arm, workstations equipped with magnetomechanical anchors/locks and handrail clamps for small external payloads are used on the external surface of the station. Simple and convenient racks for payloads (after their assembly in orbit) equipped with roll-out shelves-modules and frames-arches, a complete set of electrical/information interfaces, along with multipurpose gloveboxes, incubators for lower and higher temperatures, vibration-isolating platforms, also are used in pressurized compartments of the ISS RS. Almost all of them have already been tested in flight, but wide application of the workstations, racks, facilities, and tools will start aboard Multipurpose Laboratory Module (MLM) Nauka (Science in English), which is targeted for the station in the near future. The next Scientific-Power Module that should also become a part of the ISS RS after MLM, will be equipped with the enhanced MLM-type workstations. This paper describes and analyses capabilities of engineering facilities and tools to support payloads use, maintenance, and testing aboard the MLM Nauka, in context of execution of the Long-Term Dedicated Research Program aboard the ISS RS until 2024, and to the future exploration program.