

HUMAN SPACE ENDEAVOURS SYMPOSIUM (B3)
How Can We Best Apply Our Experience to Future Human Missions? (2)

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INTEGRATED CONTROL SYSTEM OF THE ISS MULTIPURPOSE LABORATORY MODULE: NEW
APPROACHES IN CONCEPTUAL DESIGN

Abstract

This paper covers certain key features of the Multipurpose Laboratory Module (MLM) development. MLM is the most significant addition to the Russian Segment of the International Space Station (ISS RS) since its Service Module (SM) launch in 2000. The MLM utilization main tasks are: (1) providing more possibilities for the research program implementation on the ISS RS; (2) providing additional habitable volume for the ISS crewmembers; (3) onboard activity support on the ISS RS (providing a docking port for Soyuz and Progress spacecrafts, the European Robotic Arm (ERA)-assisted extravehicular activity support and others). Onboard Equipment Control System for MLM is being developed on the electronic components with using of the standard digital control interfaces. It is a new step as compared with traditional relay-based switching units and traditional control mode by relay-based automatics. The MLM Onboard Computer System will be integrated into the ISS RS Onboard Computer System. The MLM Guidance Navigation and Control (GN&C) System will secure approach and automatic docking of the 20-tonne module to the Service Module docking port to minus Y SM direction. Special attention at MLM Control System development is given to scientific experiments control task solution. For this purpose the Information and Control System (IMS) of MLM is being developed. The system is equipped with standard hardware interfaces for support of scientific experiments conducting. The MLM IMS will provide information support for payloads from the ISS RS Onboard Computer System (GN&C data, precise time reference, etc.). This paper also analyzes new approaches in conceptual design of the MLM integrated control system.