

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

Author: Dr. Sergey K. Shaevich
Khronichev State Research & Production Space Center, Russian Federation,
Shaevich.S.K@khronichev.com

Dr. Sergey Pougachenko
Khronichev State Research & Production Space Center, Russian Federation, mks@khronichev.com

UTILISATION IN FUTURE SPACE MANNED PROGRAMS OF THE FGB “ZARYA”
DEVELOPMENT AND ADAPTATION EXPERIENCE TO THE ISS PROGRAM CHANGES

Abstract

The FGB “Zarya” distinctions from analogues which allowed fulfilling successfully the role of the first ISS module are summarized. The possibilities of FGB transformation to meet the ISS assembly changes were initially envisaged and implemented later. The additional FGB in-flight modifications caused by redistribution of power supply and life support functions between American and Russian segments are described. The FGB positive results achieved are due to skilled personnel of mission control center accomplished by engineering support as well as the adjusted system of spares logistics and on-orbit maintenance by ISS crew. The statistics data of FGB as a source and user of ISS on-board resources of power, crew activities/accommodations, cargo and fuel storage are provided. The resent new tasks of FGB to function beyond prescribed 15 years as well as ways to resolve them are analyzed. The proposed multi-step approach takes into account non-replaceable parts of FGB structure and on-board systems as the most critical. It is based on the analysis of the FGB characteristics, on-ground tests of prototype equipment. The analysis of FGB material specimens returned by Space Shuttle is planned. The COFR also includes the analysis of functional redundancy and spares availability. Because of FGB is the “oldest” module of ISS it becomes the pilot example of long-duration space flight technologies. The brief description of Lunar manned future program concept with long-life on-orbit and surface outposts is presented where the main aspects of the FGB experience could be used.