SPACE DEBRIS SYMPOSIUM (A6)
Operations in Space Debris Environment, Situational Awareness (7)

Author: Mr. Mikhail Astrakhantsev
Central Research Institute of Machine Building (TSNIIMASH), Russian Federation,
Mihail.Astrakhantsev@gmail.com

THE SPECIAL ASPECTS OF THE ISS FLIGHT CONTROL IN THE SPACE DEBRIS ENVIRONMENT

Abstract

The space debris problem is closely connected with the International Space Station flight. ISS has a special status in the process of flight safety ensuring. At present time ISS is a unique object in interests of which the main principles of interaction between different international organizations are applied in effort to ensure the station safety. The risk assessment of collision between the ISS and other different space objects is implemented from the launch of the 1st ISS module in 1998. In Mission Control Center there is a great database of all known close approaches between different space objects and ISS during the period of its functioning. The database contains a lot of messages about close approaches between ISS and different space objects. These messages contain the information about relative positions between ISS and space object, time of the close approach, ISS and space object state vectors on the moment of the closest approach. On the basis of this database analyses an understanding about the ISS flight safety threats from space debris were made and some aspects of flight control in the space debris environment were received. This report presents the results of MCC database analysis with the dependences of the dangerous situations number from the orbit height and from the orbital explosions and other dependences. Also the report is dedicated to the selection of the possible ballistic debris avoid maneuvers schemes calculated by MCC specialists. These schemes depend on different aspects like space object and ISS relative orbital position, the number of threatening objects and accuracy of its close approaches, necessity of the space flight program implementation, different constraints maintenance and etc. The report describes the process of interaction between different operative groups in effort to ensure the ISS flight safety and some special aspects connected with this process.