

## HUMAN SPACE ENDEAVOURS SYMPOSIUM (B3)

## Human Space Endeavour: Overview (1)

Author: Dr. Alexander G. Derechin

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

## LESSONS LEARNED FROM INTERNATIONAL COOPERATION

**Abstract**

10 years ago the Intergovernmental Agreement on the ISS program was signed, and Zarya Functional Cargo Module was launched. This year after ESA module Columbus and JAXA module Kibo are delivered to the ISS, the station is “globalized”. ESA member-states, Japan and Canada became “full” Partners having the rights for flight opportunities, ISS user resources and bearing obligations for the operations. The ISS lessons are very important for successful international cooperation now and in future. The international cooperation mechanism in the ISS program mainly includes the following: (1) Bilateral MOUs between NASA and each Partner; (2) Implementing arrangements on balance of rights and contributions; (3) Program control boards; (4) Working groups. By agreement the Partners follow the principles mentioned below: a) All Partners have equal rights in making decisions. As a rule, decisions are taken by consensus; b) NASA has the leading role and gets the corresponding compensation for that; c) Operations related to crew safety and ISS robustness have priority over other operations including utilization; d) ISS momentum, including station assembly, is mainly driven by the funding level (first of all in the USA and Russia). It is worth mentioning the main achievements: 1) integrated onboard systems, integrated crew and integrated mission control providing for the permanent successful ISS and crew operations; 2) compared to other programs, more simple and efficient mechanism for technology transfer; 3) back-up capabilities of the Partners to counteract “problems” of other Partners. The main drawbacks of the existing ISS cooperation mechanism: insufficient attention to utilization; excessive bureaucracy; difficulties for the participation of non-partners and private business. International Space Station is the most global and successful intergovernmental program in the area of high technologies. Further evolution of international cooperation in space area may go in the direction of intergovernmental projects such as Moon and Mars programs and in the direction of commercial programs, such as Sea Launch, space tourism and others. The following issues are the most important for the intergovernmental projects: A) development of common standards (reliability and safety certification, etc.); B) development of common interfaces (mechanical, hydraulic, electrical, data, etc.); C) development of the efficient MTCR procedures. The following tasks are to be resolved for commercial space programs: development of international legislation to regulate property rights, responsibility of the project participants, etc.