

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Commercial Human Spaceflight Programmes (2)

Author: Ms. Oksana Grigorieva
JSC Glavkosmos, Russian Federation, oksana.grigorieva@glavkosmos.ru

Mr. Dmitry Loskutov
JSC Glavkosmos, Russian Federation, dmitry.loskutov@glavkosmos.ru

DEVELOPMENT OF THE INTERNATIONAL SPACE STATION AS COMMERCIAL INVESTMENT
IN ORBITAL RESEARCH

Abstract

The International Space Station (ISS) is a joint project between five participating space agencies: Roscosmos, NASA, JAXA, ESA and CSA. More than 200 astronauts from 19 different countries have visited the ISS. The ISS serves as a microgravity and space environment research laboratory in which crew members conduct experiments in biology, physics, astronomy, meteorology and other fields. The ISS is constantly developing system having many features that make it a unique facility for engineering research and technology development. New technologies and modules integrated into the ISS significantly reduce the space station's operational costs and thus free resources for other space activities. Reducing costs means that self-supporting commercial activities on the ISS are getting closer to reality, attracting more and more commercial investment in orbital research. "Nauka" (in Russian language - Science), also known as the Multipurpose Laboratory Module (MLM) is a component of the ISS, funded by Roscosmos State Space Corporation. "Nauka" will be Russia's primary research module initially used for experiments, docking and cargo. It will include the European Robotic Arm (ERA) manipulator, which allows cosmonauts to perform a number of works without going into outer space. "Nauka" will be equipped with engines and attitude control system that can be used as a backup by the ISS. The new module will contain crew quarters with life support equipment including atmospheric processing. It is supposed to be launched into space in 2020 and docking to "Zvezda" module. Science Power Module (also known as "NEM") should become the most advanced component joining the Russian segment of the International Space Station. It will carry state-of-the-art laboratory facilities and large power-generating solar arrays. "NEM" will provide additional living quarters and new flight control systems. "NEM" module will be the basis for future efforts to send humans beyond the Earth orbit. Thanks to its multi-function design, life support and power-supply capability, one or a whole cluster of such vehicles could provide habitation quarters and laboratories for the station at so-called "Lagrange points", which are considered as a staging ground for possible exploration of the Moon, asteroids and Mars. The module is planned to be dispatched at the ISS in 2022.