

HUMAN SPACEFLIGHT SYMPOSIUM (B3)  
Advanced Systems, Technologies, and Innovations for Human Spaceflight (7)

Author: Mr. Igor Verkhovsky  
S.P. Korolev Rocket and Space Corporation Energia, Russian Federation, Igor.Verkhovsky@rsce.ru

Ms. Anastasia Murashko  
RSC Energia, Russian Federation, Anastasiya.Murashko@rsce.ru  
Mr. Steven Johnston  
The Boeing Company, United States, steven.johnston@boeing.com

SOLAR ELECTRIC PROPULSION DEMONSTRATIONS FOR THE INITIAL BEYOND LEO  
MISSIONS

**Abstract**

Utilization of Solar Electric Propulsion is crucial for effective long-term beyond LEO missions' implementation. Available technologies enable development of solar tugs with tens of KW capacity. Initial system-level technology demonstrations (solar arrays, engines, etc.) could be performed within the ISS. Demonstrating technologies in the framework of missions, which can potentially contribute to the beyond LEO exploration, is considered to be reasonable. Development of a power and propulsion module, based on SEP technologies, for EML2 outpost could be one of these reasonable solutions. Requirements for SEP in terms of power supply, outpost keeping and maneuvering in cis-lunar space can be met utilizing available (debugged) technologies and solutions. As a demonstration of existing technologies some other tasks can be performed in support of initial manned flights beyond LEO, such as small modules and payloads delivery to EML2 outpost, demo-SC delivery to the cis-lunar space, etc. The demonstrator can be developed by RSC Energia and The Boeing Company and deployed at the ISS.