

International Cooperation for Space Exploration (1)
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DEMOCRATIZING ACCESS TO SPACE BY APPLICATION OF UN NPS PRINCIPLES IN ROBOTIC
AND CREWED MARS-/EUROPA-INTERNATIONAL NUCLEAR POWER AND PROPULSION
SYSTEM FLAGSHIP (INPPS)

Abstract

This talk presents the contemporary status of the MARS- and EUROPA-INPPS (International Nuclear Power and Propulsion System) flagship related scenarios for utilization in international context addressing technical, scientific and especially political and legal challenges.

Since about 2015, significant technological process has been achieved for nuclear reactor usage in space, in Russia (about 1 MWe), USA (about 10 kWe) and China (about 100 kWe). Successful ground tests have been completed for the Russian space nuclear reactor. Droplet radiators and electric thrusters – foreseen to be used as INPPS flagship subsystems – have successfully passed Earth ground testing and partial space qualifications. Towards 2030, steps for realization are in preparation for the first robotic space qualification journey of INPPS flagship towards Mars, return to Earth and continuation of space flight towards Jupiter moon Europa. Therefore, the first INPPS will be the most qualified high power space transportation system with NEP (Nuclear Electric Propulsion) for safe, efficient and effective transport of humans to Mars with only one second INPPS flagship in the 2030th.

Moreover, it was very important to consider INPPS safety aspects related to Earth, interplanetary cruising, to Mars, deep space exploration to Europa as maximal preparation for humans on board with the second flagship to Mars. Mission components such as the nuclear reactor as the power source for the propulsion system will have to comply with the 1992 UN Principles Relevant to the Use of Nuclear Power Sources (NPS) in Outer Space. It will be described in details, why the flagship overfulfil the UN Principles.

This talk will address questions concerning political co-operation to receive a world-wide public, new economics in space and on Earth, scientific frontier mentality and to support UN Sustainable Development

Goals. The talk will be concluded with a ceremony of presenting the newest book edition of the English-Russian translation of the Commentary on the UN NPS Principles and including up-to-date introduction into European and Russian NPS activities.