SPACE EXPLORATION SYMPOSIUM (A3)
Space Exploration Overview (1)

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ASSESSING SPACE EXPLORATION TECHNOLOGY REQUIREMENTS AS A FIRST STEP TOWARDS ENSURING TECHNOLOGY READINESS FOR INTERNATIONAL COOPERATION IN SPACE EXPLORATION

Abstract

Advancing critical and enhancing technologies is considered essential to enabling sustainable and affordable human space exploration. Critical technologies are those that enable a certain class of mission, such as technologies necessary for safe landing on the Martian surface, advanced propulsion, and closed loop life support. Others enhance the mission by leading to a greater satisfaction of mission objectives or increased probability of mission success. Advanced technologies are needed to reduce mass and cost. Many space agencies have studied exploration mission architectures and scenarios with the resulting lists of critical and enhancing technologies being very similar. With this in mind, and with the recognition that human space exploration will only be enabled by agencies working together to address these challenges, interested agencies participating in the International Space Exploration Coordination Group (ISECG) have agreed to perform a technology assessment as an important step in exploring cooperation opportunities for future exploration mission scenarios.

"The Global Exploration Strategy: The Framework for Coordination" was developed by fourteen space agencies and released in May 2007. Since the fall of 2008, several International Space Exploration Coordination Group (ISECG) participating space agencies have been studying concepts for human exploration of the moon. They have identified technologies considered critical and enhancing of sustainable space exploration. Technologies such as in-situ resource utilization, advanced power generation/energy storage systems, reliable dust resistant mobility systems, and closed loop life support systems are important examples. Similarly, agencies such as NASA, ESA, and Russia have studied Mars exploration missions and identified critical technologies. They recognize that human and robotic precursor missions to destinations such as LEO, moon, and near earth objects provide opportunities to demonstrate the technologies needed for Mars mission.

Agencies see the importance of assessing gaps and overlaps in their plans to advance technologies in order to leverage their investments and enable exciting missions as soon as practical. They see the importance of respecting the ability of any agency to invest in any technologies considered interesting or strategic. This paper will describe the importance of developing an appropriate international strategy for technology development and ideas for effective mechanisms for advancing an international strategy. This

work will both inform and be informed by the development of an ISECG Global Exploration Roadmap and serve as a concrete step forward in advancing the Global Exploration Strategy.

For more information on the ISECG please visit www.globalspaceexploration.org or contact the ISECG Secretariat at: isecg@esa.int.