

International Cooperation for Space Exploration (1)
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AN INTERNATIONAL APPROACH TO THE COORDINATION OF TECHNOLOGY
DEVELOPMENT EFFORTS ENABLING THE GLOBAL EXPLORATION ROADMAP

Abstract

The International Space Exploration Coordination Group (ISECG) is a voluntary, non-binding coordination forum of 26 space agencies. Building on the 2018 Global Exploration Roadmap (GER) and on growing global interest in space exploration, ISECG's GER Supplement (Aug 2020) captures the latest developments in lunar exploration planning in an updated Lunar Surface Exploration Scenario. The Supplement describes also emerging national and commercial capabilities to enable lunar initiatives that will serve as preparation for missions to Mars and for further activities on the Moon.

Each step in expanding human presence beyond low Earth orbit relies on the readiness of new capabilities and technologies. As individual agencies may not have the resources to develop all these critical capabilities, appropriately leveraging global investments in technology development and demonstration is important. Although technology development is a competitive area, space agencies seek to inform their technology investment planning, create synergies and maximise their readiness to play a critical and visible part in the global exploration endeavour.

Space agencies participating in ISECG have identified a list of critical technologies related to the missions shown in the GER architecture that are currently not available or which need to be developed or matured. These technologies can be considered technology "pulls" from the GER point of view, even if

the performance characteristics are to be seen as targets and not as mission defined requirements. These technology needs can be mapped to corresponding agency technology development activities; subsequently global technology gaps can be assessed.

The current list of 47 technologies has been identified as being critical to advance the ISECG mission scenarios in the GER architecture. This list of technologies is building on a portfolio list of enabling critical technologies resulting from a human deep space exploration architecture analysis conducted by NASA and published in 2012. The list of technologies presented in this document is maintained by the ISECG/Technology Working Group and updated based on the evolution of the GER mission scenario.

The purpose of this paper is to share ISECG's approach to advance the coordination of technology development efforts and introduce the GER Critical Technology list to exploration stakeholders to inform the dialogue on priorities for technology development to enable the GER mission scenario.