

SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND  
DEVELOPMENT (D3)Strategies & Architectures as the Framework for Future Building Blocks in Space Exploration and  
Development (1)

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OUTLOOK OF POSSIBLE EUROPEAN CONTRIBUTIONS TO FUTURE EXPLORATION  
SCENARIOS AND ARCHITECTURES**Abstract**

Building upon the important experience acquired with the development of the International Space Station, the major spacefaring countries are working within the International Space Exploration Coordination Group (ISECG) at the definition of a coordinated framework for expanding the human presence beyond the Low Earth Orbit, the Global Exploration Roadmap (GER). The GER defines a long-range strategy for global exploration and include three major elements:

- Common goals of ISECG participating agencies for space exploration.
- Notional mission scenarios which are technically feasible and programmatically implementable. Two mission scenarios were defined in the 1st iteration of the GER: the "Asteroid Next" and the "Moon Next" mission scenarios.
- Identification of near-term opportunities for coordination and cooperation related to e.g. the development of technologies, the implementation of robotic missions to destination of interest for closing strategic knowledge gaps which need to be addressed prior to human missions as well as the utilization of ISS for demonstration of exploration enabling capabilities.

In 2009 two studies have been awarded by ESA to Industrial Teams led by Thales Alenia Space - Italy and by Astrium - Germany to define, analyze and assess optional European scenarios for future human

spaceflight and exploration activities, and to derive the required capabilities for the investigated time-frame until the year 2033. Work on the European scenarios has been aligned with and informed by the international work on the GER.

A conceptual design of the different Building Block Elements has been performed and analyzed with respect to programmatic risks, budgets and required technologies. Key driving requirements for the analyzed Building Block elements have been derived from the international Design Reference Missions included in the GER.

The major outcomes of the human exploration scenario study will be presented, identifying opportunities for European Contributions to an international roadmap for human and robotic exploration.