SYMPOSIUM ON BUILDING BLOCKS FOR FUTURE SPACE EXPLORATION AND DEVELOPMENT (D3)
Systems and Infrastructures to Implement Future Building Blocks in Space Exploration and Development (2)

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DEVELOPING EXPLORATION KEY TECHNOLOGIES FOR IN-ORBIT VALIDATION: THE STEPS2 PROJECT

Abstract

Building upon the important results obtained by STEPS (Sistemi e Tecnologie per l'EsPlorazione Spaziale), a second phase of this research project has been recently undertaken as a joint development of technologies and systems for Space Exploration supported by Regione Piemonte, the European Regional Development Fund (E.R.D.F.) 2007-2013, Thales Alenia Space Italia, SMEs, Universities and public Research Centres belonging to the network "Comitato Distretto Aerospaziale del Piemonte" the Piedmont Aerospace District in Italy.

STEPS2 has been conceived in line with the Global Space Exploration Plan and associated stream of initiatives with the aim to catalyze and bring to maturity the technology development initiated in STEPS for potential technological demonstrations in near-term space missions like:

- robotic exploration of Moon and Mars
- in-orbit demonstration, making use of the ISS utilization as technological test-bed for several exploration technologies
- re-entry transportation, both manned and un-manned, and their related technological demonstrators

STEPS2 main objective, in fact, is to close the gap between the TRL levels reached by the selected technologies with the STEPS programme activities (i.e., 3 or 4) and the level required to apply/demonstrate these technologies in space. Taking into account the potentiality for near-term applicability, the following technologies have been selected for further development in STEPS2:

- Precision Landing
- Surface Navigation
- Smart Skin
- Landing Legs
- Regenerative Fuel Cells
- RVD & Mechanisms
- Inflatable and Environmental Protection
- Ablative/aerothermodynamics

- Health Management Systems / Ultralight Structures

This paper will present the main results of the first year activity.