

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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MARCO POLO: ATMOSPHERIC IN-SITU RESOURCE UTILIZATION FOR MANNED MARTIAN
MISSIONS

Abstract

Success of future manned and sample return missions to Mars and other deep space bodies will rely upon In-Situ Resource Utilization (ISRU) to provide return propellant and life support system commodities from indigenous resources. The Mars Atmospheric and Regolith Collector/Processor for Lander Operations (MARCO POLO) is a multi-center NASA project working towards an ISRU lander payload that integrates Mars soil and atmosphere processing to produce propellant. Kennedy Space Center (KSC) has focused on the Atmospheric Processing Module (APM) of MARCO POLO. The purpose of the APM is to capture and pressurize carbon dioxide from a simulated Martian atmosphere (95.32