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A CONCEPTUAL DESIGN STUDY OF CRYOGENIC FUEL STATION AND SYSTEM CONFIGURATIONS FOR HUMAN LUNAR EXPLORATION MISSION

Abstract

International Space Exploration Coordination Group (ISECG) released reference mission scenario ultimately conducting manned exploration to the Mars, which is known as the Global Exploration Roadmap (GER). On the course of attaining the ultimate goal, the Moon is one of the most promising intermediate destinations. This paper gives the results of a conceptual design study of system architecture for a reference mission scenario of Human Lunar Exploration. Liquid oxygen and liquid hydrogen (LOX/LH2) are selected as common propellants for emergency escape vehicle, human lunar lander, and lunar sample recovery vehicle. Earth-Moon Lagrange Point2 (EML2) Manned Station is designed not only as the base camp for exploration, but also as the LOX/LH2 depot for above-mentioned vehicles. Within candidate exploration architectures, electric propulsion OTV is also proposed.