SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Future Space Transportation Systems (4)

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CONCEPT STUDY OF REUSABLE MULTI-PURPOSE MANNED SPACECRAFT

Abstract

The capability of accessing to space is an important factor of human space activities. Currently ISS is the only facility for human near-earth activities. With the construction of Chinese Space Stationthe rising of near-earth commercial manned space activities, and the exploration of future manned deep space, manned space transportation demand will continue to increase. For a long time manned spacecraft has been an important way for human to access space, and in the future it will act as the same role. The manned spacecrafts in active service and under development are Soyuz spacecraft, Shenzhou spacecraft, Multi-Purpose Crew Vehicle, Dragon spacecraft,CST-100, Dream Chaser, Clipper and PPTS.This paper analyzes the development trend of new manned spacecraft and the demand of future space stationmanned lunar exploration and deep space exploration. A new concept of Reusable Multi-Purpose Manned Spacecraft (RMPMS) is proposed. The concepts of generalization, modularization, reconfigurable are adopted in the design of RMPMS. RMPMS can be divided into reentry vehicle and orbiter. The reentry vehicle adopts no-wing lifting-body configuration and can be used repeatedly. The orbiter can be reused by propellant refueling, and can adapt to the near-earth manned activitythe manned lunar exploration and manned deep space exploration by combining multiple orbiters.