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POWER SYSTEM TECHNOLOGY APPLICATION OF RENDEZVOUS AND DOCKING IN MANNED SPACE FLIGHT

Abstract

The power system of TG-1 target spacecraft and Shenzhou manned spacecraft in the rendezvous and docking flight is the first associated application of high voltage power system and low voltage power system. This report focuses on the development of the first LEO high voltage power system of the TG-1 target spacecraft. Many key technologies have been resolved including LEO high-voltage protection, such as semi-rigid solar wings, LEO long life nickel-metal-hydride batteries, and LEO long life driven institutions. And the technical solutions of TG-1 power system can meet the LEO high-pressure safety design challenge. The manned spacecraft power system is low-orbit, which focuses on manned safety and reliability, and the grid connection technology of muti-power and muti-unit have been safely validated. The first rendezvous and docking task indicate that the technology with combination of LEO low voltage power system and LEO high voltage power system is practicable, and the muti-grid connection controlling technology is reliable and steady. These technical achievements would play an important role in promoting the development of China's LEO high-power electrical power system.