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Author: Dr. Zhen Huang
Institute of Manned Space System Engineering, CAST, China, huangzhencast@126.com

Mr. Haifeng Yang
China, wuwr@qq.com
Dr. Wenrui Wu
Institute of Manned Space System Engineering, China Academy of Space Technology (CAST), China,
wenruiwu@buaa.edu.cn

ECONOMIC EVALUATION OF REUSABLE CREW RETURN VEHICLE BASED ON LIFE CYCLE
COST

Abstract

In recent years, the continued development of the next generation crew return vehicle (CRV) becomes more and more notable. NASA is committed to Orion, which will take astronauts beyond low Earth orbit (LEO) to deep space, provide emergency abort capability, sustain the crew during space travel and provide safe reentry from deep space. The CST-100 of Boeing and the SpaceX Dragon are competing to be the commercial provider of transportation to the ISS, with the support of NASA's Commercial Crew Programs. Russia is developing the PPTS, which transportation to the ISS, LEO and deep space, using different sizes of propel module. China and India come to heel.

The next generation crew return vehicles of different organizations use different technology, but all of them are reusable for up to 10 flights in order to reduce the average cost of the single vehicle in economic evaluation. This paper presents the economic benefits on reuse of crew return vehicle. First of all, a 3-dimensional life cycle cost (LCC) model for the evaluation system of reusable crew return vehicle is built. Then, the effect of the major elements on the model is discussed with some examples. Suggestions such as reuse rate, reuse times, life period, manufacturing cost, mission cost and so on are presented at last.