49th IAA SYMPOSIUM ON SAFETY, QUALITY AND KNOWLEDGE MANAGEMENT IN SPACE ACTIVITIES (D5)
Risk Management for Safety and Quality in Space Programs (1)

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INNOVATION AND PRACTICE OF TECHNICAL RISK MANAGEMENT METHODS IN CHINESE LAUNCH VEHICLE ENGINEERING

Abstract

The characteristics of launch vehicle engineering determine that effective analysis and control of technical risks have important theoretic worth and practical significance. During continuously successful development and emission records of more than 10 series of Long March launch vehicles in CALT in the past 60 years, by consistently insisting on the scientization of quality management, CALT systematically integrates system engineering theories, risk management techniques and quality-reliability techniques, successfully sets up technical risk control system based on taking engineering process as working guide, taking methods as core, taking organization as guarantee and taking technological base as support. Combining the industrial foundations and developing laws of Chinese aerospace engineering, CALT continuously and systematically innovates a series of technical risk management methods adapted to the characteristics and situation of Chinese aerospace engineering, including analysis of single-point breakdown mode, analysis and confirmation of flying sequential actions, combining analysis of FTA and FMEA, envelope analysis of successful data and so on. Through successful practice, CALT has obtained good application effects such as building up successful and strong foundation in order for normalization, systematization, standardization and quantization of developing changes in technical risk control system, enhancement in controllability of technical risks, satisfiability of request to "high reliability, high safety, high quality and high quantity" of launch vehicle engineering under new situation, comprehensive realization of continuously successful development and emission of Long March launch vehicles.