

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)
Launch Services, Missions, Operations, and Facilities (2)

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DEVELOPMENT AND PROCESS OPTIMIZATION OF LM-3A SERIES LAUNCH VEHICLES
CONTROL SYSTEM IN CONTINUAL LAUNCH MISSIONS

Abstract

Since the first success of LM-3A launch vehicle in 1994, LM-3A series launch vehicles have completed more than 80 missions, which played a key role in satellite communication engineering, lunar exploration program, Beidou satellite navigation engineering, meteorological satellite engineering and international commercial satellite launching services. It is the representative of Chinese commercialized rocket. From 2006 to 2012, LM-3A series launch vehicles completed 2 rounds of continuous launches which were nearly 40 launch missions. It is expected that LM-3A series will have about 40 launch missions in the next three years. Control system is an important part of the launch vehicle. Every year it is needed to complete more than 10 rockets of system production, more than 10 rockets of systems deliver and more than 10 launch missions. In this case we have optimized rapid development continuous improvement and management process in the following aspects 1. Optimizing the test process of the control system shortened the development time of the control system by improving the product efficiency of volume production and optimizing the process of the system test both at home and in the launch site. 2. Multi-state and multi-configuration design of electrical system is improved in unification and universalization adapting to 7 rocket configurations and 8 satellite interfaces. 3. Unified software design: The flight software and test control software meet the different status of launch tasks including GTO orbit, IGSO orbit and upper stage MEO orbit. Multi-trajectory flight timing is also developed in unified design. 4. Advanced testing tools such as automatic generation of flying elements, automatic test system, expert diagnostic system data analysis system are fully developed. The development and process optimization of control system has effectively improved the production quality and efficiency of control system in frequent launch missions, and it enhances the support ability of control system development.