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RESPONSIVE TEST TECHNOLOGY FOR CHINESE NEXT GENERATION LAUNCH VEHICLE

Abstract

This paper presented the responsive test technology for Chinese next generation launch vehicle (LV). In the design, a high speed data bus connected on-board system (OBS) and ground system (GS), all the data were sampled by OBS based on BIT technology, and sent to GS through the bus without on-board software intervention. Data evaluation was completed in ground terminal, where the on-board processing could be duplicated and played back concurrently with the same model, algorithm and inputs, so the results of the two systems could be compared for FDI. The paper gave a comprehensive introduction to the realization of the design, such as bus interception, which was different from BM of 1553B data bus, and an appropriate monitor point was installed in OBS to collect data; data-driven analysis, which was triggered in GS during interception, and provided convenience for failure isolation; system-in-the-loop test, which was a closed-loop testing method integrated with mathematical simulation model of LV, and was suitable for checkout on launch site. Due to the design, data evaluation was performed in real-time, automatically, and adaptively to various test cases. Moreover, the interfaces between LV and test and launch control system (TLCS) were dramatically simplified, and could be standardized to expand the adaptability of EGSE. The design had been applied in CZ-7 medium-size LV, which greatly reduced the time for checkout and engineers on site for technical support.