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LESSONS AND LEARNS OF LAUNCHING TEST LAUNCH VEHICLE OF KSLV-II CONCERNING LAUNCH COMPLEX DEVELOPMENT

Abstract

On November 28, there was a successful launch of Test Launch Vehicle of KSLV-II. The main purpose of this launch was testing a new 75-ton liquid rocket engine in flight condition and it was fully achieved. In addition, we have acquired many 'lessons and learns' in planning and doing the entire launch operation. First of all, it gave the opportunity to verify entire process of designing and constructing a launch facility for a new launch vehicle including operations. The launch was done using the KSLV-I Naro launch facility. The normalization of functions and remodeling, improvement of the existing launch facility was carried out such as interface modification, construction newly employed equipment, and development of new launch operation procedure to suit the new launch vehicle. Through this, it was possible to verify the design and construction works of the new launch facility for the KSLV-II. Renovation of KSLV-I launch facility gave us also good opportunity to accumulate experience. The performance and adaptability of newly required equipment in launch facility were verified in this launch. The KSLV-II requires a Vehicle Holding Device that holds vehicle for 2 to 5 seconds under a full thrust to check normal operation of engine at very initial stage of combustion. In addition, a device for connecting and recovering umbilical is newly adopted when launch vehicle lift off. The key parameters needed to design these equipment were acquired and knowledge and experience of the development procedures were also learned. It can be applied to the KSLV-II development using verified mechanism through this launch. By redesigning the entire process of the launch operation and applying it to actual launch, it was able to develop a suitable launch operation procedures for the KSLV-II. Since the KSLV-II is a newly developed launch vehicle, the launch operation procedure should be applied differently in many ways, even if a similar launch facility is used. In this test-launch, the newly developed launch operation was tried and verified. It was also possible to train launch operators and check the suitability of support facilities. Through the test-launch of KSLV-II, we have achieved renovating and recycling existing launch facilities, and developing and verifying new launch operation procedures. By using the lessons and learns, it will be helpful to successful development and launching of KSLV-II that will be became a main launch vehicle of Korea.