

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

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DEVELOPMENT OF MODERN MISSION ANALYSIS SYSTEM AND MISSION PLANNING  
IMPROVEMENT IN H3 LAUNCH SYSTEM PROGRAM

**Abstract**

Mitsubishi Heavy Industries, LTD (MHI) is developing next generation H3 launch vehicle with JAXA to meet future launch market demand toward FY2020 maiden flight. H3 provides higher performance, lower price and higher reliability than current H-IIA/H-IIB launch vehicles and most of other conventional launchers.

In parallel, we are working on launch service improvement. Looking at recent satellite market, mission variety is more and more increasing as represented by constellation missions and readiness to customer needs and short term delivery have become higher priorities than before.

Considering that situation, H3 program explicitly defined shortening mission analysis period to 3 months as a development requirement. It enables satellite customers to delay deciding satellite mission requirement as late as possible. In addition, we are planning to provide L-3 quick launch service for 'similar-to-past-experienced' missions such as replacing constellation satellites on a similar orbit. In that case, mission analysis should be done within a month.

To achieve the above H3 program requirement, we reviewed overall analysis process and data flow and are developing a new mission analysis system called SMASH with JAXA. SMASH or Streamlined Mission Analysis System for H3 drastically reduces engineering work and analysis period by highly automating data-handling and trajectory design and introducing sophisticated database among analyses. It is designed to be enhanced sustainably just by updating each analysis module to follow future mission trend. In addition, the core of the system is designed to be universal so that it can be applied to other Japanese

launch vehicles. As for L-3 quick launch service, we will also introduce 'common trajectory concept' to shorten the period drastically.

This paper reports such efforts on mission planning improvement as well as development of SMASH.