

SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
Future Space Transportation Systems (4)

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A ROAD MAP TOWARD JAPAN'S FUTURE REUSABLE SPACE TRANSPORTATION SYSTEM

**Abstract**

Mitsubishi Heavy Industries, LTD. (MHI) has been contributed to the development and manufacture of liquid fuelled launch vehicles from early phase in Japan. MHI began providing launch services with H-IIA launch vehicle for both commercial and government missions in 2007. In 2013 the H-IIB was added in the line-up of service launcher family. The latest success rate of H-IIA/B has reached to 97 percent. In addition, the development of new expendable launcher H3 has started, and it's first flight is planned in FY2020.

In parallel, aiming for the drastic reduction of space transportation cost, RD for the reusable space transportation systems are in progress. The fundamental technologies for reusable engine, landing gear, and propellant management devices needed during way back flight, has been developed with JAXA. Especially, reusable 40 kN thrust liquid hydrogen/oxygen engine has been developed and demonstrated successful firing worth 100 flights duration in 2014. Additionally, MHI has studied guidance, navigation and control technology for vertical landing rocket, and demonstrated the control law in the flight test by a subscale experimented vehicle.

This paper describes the current RD status of reusable rocket and approach to future reusable space transportation system which MHI considers.