Technical Review Special Edition: Aerospace Technology

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Welcome to this special edition of our technical review featuring aircraft and space projects.

On April 1, 2017, Mitsubishi Heavy Industries, Ltd. (MHI) launched its Aircraft, Defense & Space domain, which consists of three segments: Integrated Defense & Space Systems, Commercial Aviation Systems, and MRJ Division.

As the defense and space system business, covered by the Integrated Defense & Space Systems segment, is substantially affected by the government budget, our performance in this field has remained almost flat for over 20 years. As such, the Integrated Defense and Space Systems segment faces challenges in terms of business expansion and strengthening of fragile profit structure.

To address these issues, we established a three-part growth strategy that includes overseas expansion, dual-use applications (for civilian and military use), and expansion of existing businesses. The space sector in particular presents many opportunities such as an increased need for satellites in emerging countries, the Japanese government's revised basic plan on space policy and roadmap, and expansion of the satellite launching businesses.

This special edition introduces research activities, latest developments, and also future prospects for the following four projects we have been working on to expand our space business.

The H3 launch vehicle, a successor to the H-IIA/H-IIB, is Japan's new flagship rocket currently under development in partnership with the Japan Aerospace Exploration Agency (JAXA). Its maiden flight is set for 2020. A key development target is increased commercial satellite launch business through superior cost competitiveness. The article reports on the latest development status of this project.

A reusable launch vehicle is being pursued as a means to significantly reduce space transportation costs. MHI is participating in elemental technology demonstrations led by JAXA. In addition, MHI has independently conducted technology research in-house on landing guidance control. The article reports on research results in both areas.

The Arase spacecraft, a geospace exploration satellite, developed by JAXA, was launched into space in December 2016 to closely observe the formation process of high-energy electrons trapped in radiation belts surrounding the Earth (i.e., the Van Allen belts). Its probe has been generating data successfully. The article provides an overview of MHI's participation in the Arase mission module development.

A small thruster is a small liquid rocket engine used for orbit maneuvers and attitude control of a satellite. MHI has been developing small thrusters designed for next-generation commercial satellites with high control-precision and longer lifespan. The article gives an overview and reports on development status and future plans.

We hope this special edition will facilitate a deeper understanding of MHI businesses and we deeply appreciate your ongoing support and guidance.