

Technical Review Special Edition: Aircraft, Defense & Space

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Welcome to the special edition of our technical review featuring aircraft, defense and space projects.

Although the commercial aviation industry suffered greatly from the impact of the COVID-19 pandemic, global air travel demand rebounded to the 2019 level by 2024. It is expected to continue to rise at an annual rate of 3-4% in the years to come, boosting the demand for newly manufactured aircraft. To respond to such growing demand, aircraft OEMs are in a rush to build a ramp-up production system, taking on challenges such as strained supply chains, quality issues and shortage of human resources. Sustainable aircraft and their operations for decarbonization are also required to achieve CORSIA's target for 2035 and carbon neutrality by 2050, which were adopted by ICAO. As such, the business environment surrounding the industry is rapidly changing.

There are three possible approaches for achieving carbon neutrality by 2050: (1) technological innovation for aircraft, (2) flight operation improvement and (3) fuel. Of these, CO₂ reduction using SAF is expected to be the most practical solution at this point.

The promotion of digital thread and digital transformation is also expected to help develop aircraft and improve productivity and flight operation safety. These technological innovations not only increase work efficiency and increase productivity, but also make a faster and more flexible response possible through real-time data analysis and prediction. Specifically, the use of digital technology enables the centralized management of all the processes from design to production and operation, thereby allowing decision-making based on data. This type of approach will not only enhance the competitiveness of the entire industry, but also help to improve customer satisfaction.

Cross-border efforts will be indispensable in the coming years. It is required to proceed with the development of innovative technologies through cooperation with companies and organizations in various countries. In particular, since rebuilding global

supply chains and adapting to environmental regulations are urgent priorities, the framework for cooperation needs to be strengthened more than ever.

In light of the current business environment, MHI Group will make more efforts to improve the efficiency of aircraft production and reduce the environmental impact. Specifically, we are promoting the introduction of advanced production processes, the development of new materials, and the promotion of energy-saving technologies. The industry's collective wisdom and capabilities will be called upon to make sustainable aircraft production and flight operations a reality. MHI Group believes that such efforts will help to create a better future for the aviation industry.

This edition contains five reports related to the commercial aircraft business. The first topic, regarding flight operations, is the AI-powered flight support service, which was jointly developed with Japan Airlines Co., Ltd. In this service, meteorological data are used to predict the lightning strike risk, thereby contributing to better operational efficiency and aircraft safety. In the production department, the aircraft production cost, lead time and weight are reduced using the fusion bonding technology for thermoplastic composites. The environmental impact is also lowered by effectively utilizing the resources; the waste materials of Boeing 787 are recycled into parts for home appliances. MHI Group's activities for reducing the factory power cost and CO₂ emissions are reported as one of the efforts to achieve carbon neutrality. Lastly, the development of a new processing method in compliance with the environmental regulations is presented.

All of the reports pertain to the important initiatives that will open up a future for the commercial aircraft business. MHI Group will carry on with the efforts to help transform the industry. Your continued understanding and support are greatly appreciated.

CORSIA: Carbon Offsetting and Reduction Scheme for International Aviation

ICAO: International Civil Aviation Organization

SAF: Sustainable Aviation Fuel

AI: Artificial Intelligence