

“Group Management Policies 2023”

Transforming Business and Business Portfolio

Growth Business

Aero Engines and Space, which are positioned as a Growth Business, will drive the growth of the IHI Group by pursuing business and production transformation, in addition to strengthening and expanding the civil aero engine and defense business. We will also create new business areas from the viewpoint of lifecycle and value chains.

Contribute to the environmentally friendly, economically viable carbon neutrality of aircraft by leveraging high-level, differentiated technology

In “Group Management Policies 2023,” Aero Engines and Space is positioned as a Growth Business and is expected to drive forward the Group’s leap towards a sustainable high-growth company. In the aviation industry, reduction of CO₂ emissions to realize environmentally friendly air transportation is an issue. In 2022, the International Civil Aviation Organization (ICAO) adopted the goal of net-zero aircraft CO₂ emissions by 2050. The Ministry of Land, Infrastructure, Transport and Tourism (MLIT) established a Study Group on CO₂ Reduction in Aircraft Operation Field and has formulated a schedule for decarbonization of aircraft operations. The improvement target for 2030 is to reduce CO₂ emissions by about 10%. To achieve this goal, 10% of the fuel used by Japanese airlines will be replaced by Sustainable Aviation Fuel (SAF) and the aircraft operation methods will be improved. The three future initiatives listed by MLIT are 1, new technologies (electrification, hydrogen-fueled aircraft, etc.), 2, improvement of aircraft operation methods, and 3, promotion of introduction of SAF. In response, the IHI Group aims to achieve environmentally friendly and economically viable carbon neutrality of aircraft by strengthening its efforts for development and commercialization of SAF-based synthetic fuels in addition to development of proprietary differentiated weight reduction technology and electrification technology and application of hydrogen fuel.

Short-term targets

Attain the numerical targets under the medium-term plan and strengthen our global competitiveness, while maintaining our track record and value chains as our strengths and reducing CO₂ emissions by raising production efficiency and reforming operation structures

Global airline demand announced by IATA significantly declined in 2020 and 2021 due to the spread of COVID-19. The recovery trend increased particularly overseas after 2022, and the demand returned to 91% of the pre-pandemic level as of April 2023. The demand for aircraft to be delivered in the next 20 years is expected to grow steadily by 3.4% per year on average, which is a lag of few years compared with pre-pandemic forecasts (source: IATA June 2023 outlook).

Along with the increasing amount of work, the IHI Group has established the Transformation Division to raise production efficiency and reform operation structures. The Group aims to achieve the medium-term plan’s numerical targets and strengthen global competitiveness by driving forward its transformation into an organization with the world’s top-class production efficiency, responding to the upcoming production increase phase with minimum increase in staff, and reducing CO₂ emissions.

The IHI Group will fulfill supply responsibilities in growth markets by raising production efficiency and reforming

operation structures while maintaining the company’s strengths—the track records and value chains cultivated in the business of key parts for civil aero engines.

Medium-term targets

Drive forward technology development of the next-generation aircraft in the 2030s, with an eye on achieving carbon neutrality of aircraft in 2050.

In the Aero Engines and Space domain, we consider the period from now to around 2035 to be a transitional period. We will strengthen our development of technologies and products with significantly improved environmental performance to reduce GHG emissions, while maintaining economic efficiency by making lightweight and heat-resistant aircraft components through application of carbon fiber reinforced plastics (CFRP) for fan blades and ceramic matrix composites (CMCs) for turbine vanes. The Group will also concentrate efforts to develop new technologies towards realization of a carbon neutral society. The technologies include those for electrification of aircraft and their engine systems, such as engine-embedded electric machines and recovery systems for waste heat from air conditioners inside the aircraft.

From 2035, the IHI Group will aim to develop products based on technologies suitable for hydrogen, SAF, and other substitute fuels. The Group will push ahead with the development of technologies for carbon neutral aircraft while minimizing risks by generating funds for the development of next-generation aircraft for decarbonization through the stable revenues from spare parts for aero engines and other sources. In doing so, it is necessary to set forth international technology standards and commercialize products while sufficiently proving the safety of the new technologies. IHI plans to work on the development of next-generation aircraft by actively getting involved in the formulation of a new roadmap together with regulatory authorities and OEM companies from the drafting phase of technology standards.

Accelerate initiatives for the reinforcement of the rocket business and for the utilization of space, land, and underwater data

The global space industry market is expanding mainly in the satellite communication domain and the market is expected to exceed 100 trillion yen in 2040, which is about three times its current size. In addition to strengthening the competitiveness of its solid-propellant rocket (Epsilon Launch Vehicle), the IHI Group aims to establish a small- and medium-sized satellite launch

service business while promoting the establishment of a rocket lineup that can respond to diverse launch needs. Regarding initiatives for the utilization of space, land, and underwater data, the Group has started a service that, with high accuracy, grasps big data on all sea areas which is undetectable from land stations. This service is all offered real-time by monitoring data transmitted by automatic identification system (AIS) using satellites. IHI has set up a joint venture with Sumitomo Forestry Co., Ltd. to engage in a consulting business to appropriately manage tropical peatlands by combining Sumitomo

Forestry's forest management technology and data and IHI Group's weather information monitoring technology. The Group also aims to offer satellites required for space monitoring, etc. in collaboration with Northrop Grumman Corporation, a global leader in the detection and identification of orbital objects. IHI newly established the Space System Business Preparatory Office in the current fiscal year. The IHI Group will accelerate such data utilization and collaborative initiatives with partners to contribute to the realization of an affluent and safe society.

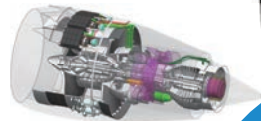
Towards a Affluent, Safe, and a Carbon-neutral society

Advancing into new markets

Expand the businesses from the lifecycle and value chain perspectives

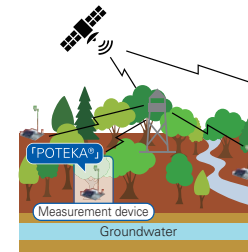
Initiatives for next-generation aircraft

- Use composite materials in airframe structure
- Develop electrification system
- Develop hydrogen utilization system
- Adapt to SAF and synthetic fuels



Initiatives to utilize space, land, and underwater data

- Monitoring and defense systems
- Collaborate with partners who use satellites in ship monitoring, forest management, etc.



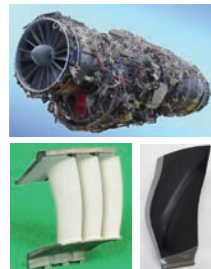
Significantly improve profitability and asset efficiency through drastic production reform utilizing digital technology

Strengthening existing businesses

Business environment: Growth has returned after the economic downturn caused by the pandemic; demand in the defense field is expanding

Strengthen aero engine business

- Raise the performance of gas turbines
- Develop engines for next-generation fighters
- Apply proprietary technologies to next-generation engines
- Build a new MRO (Maintenance Repair and Overhaul) base
- Promote the transfer of defense equipment
- Expand the casting and forging product business



Strengthen the rocket business

- Establish a production structure capable of handling the expansion of defense demand
- Strengthen the competitiveness of solid-propellant rockets
- Establish the launch service business

