AIRCRAFT, DEFENSE & SPACE DOMAIN

We are dramatically improving the profit-earnings structure of the Tier1 commercial aircraft business and concentrating on the faithful execution of the MRJ development schedule as we cultivate our base of operations from a long-term perspective.

BUSINESS SEGMENT OVERVIEW

Commercial Aircraft
Long-term customer relationships, a long history of expertise in building aircraft, and the creation of relationships with parts suppliers based on the foundation of a domestic aircraft industry.

- Design and manufacturing technologies for large composite wings and other structural components.
- Complete aircraft (MRJ) offering high levels of efficiency and reliability and outstanding economics.

Defense and Space
Leading-edge technologies fostered through the development of defense and space products.

- Defense: Ability to make proposals for integrated defense systems.
- Space: Development capabilities in launch vehicles and launch systems.
- Defense: Expertise and channels cultivated through Japan-U.S. joint development of the SM-3 missile.
- Space: Development capabilities in launch vehicles and launch systems.

Business Directions at a Key Subsidiary: Mitsubishi Aircraft Corporation

Mitsubishi Aircraft Corporation, which is handling the MRJ development, aims to acquire type certification in 2019 and, with the aim of delivering the first aircraft in mid-2020, will undergo static stress tests and the construction of final test aircraft in Japan. The aircraft will then be subjected to flight tests in Japan and the United States, and the company is putting together a customer support structure. Going forward, Mitsubishi Aircraft will continue working to achieve aircraft performance that surpasses competitors and provide extensive customer support. At the same time, the company will implement cost reductions while maintaining development and schedules and draft development and marketing strategies for subsequent commercial production and the MRJ70’s commercial viability.

To these ends, in November 2016 we established the MRJ Business Promotion Committee, chaired and directly overseen by MH’s CEO. The committee aims to accelerate decision-making and implementation through the seamless exchange of information among the three-base development structure, comprising the city of Komaki in Aichi Prefecture, Seattle, and Moses Lake in the United States. The development committee has also been revised and, with the aim of delivering the first aircraft in mid-2020, will undergo static stress tests and the construction of final test aircraft in Japan. The aircraft will then be subjected to flight tests in Japan and the United States, and the company is putting together a customer support structure. Going forward, Mitsubishi Aircraft will continue working to achieve aircraft performance that surpasses competitors and provide extensive customer support. At the same time, the company will implement cost reductions while maintaining development and schedules and draft development and marketing strategies for subsequent commercial production and the MRJ70’s commercial viability.

Directions for Fiscal 2017 and Focus Strategies for the Medium to Long Term

In the Tier1 commercial aircraft business, we are working to quickly improve earnings. First, we are using robotic to automate assembly and enhancing the efficiency of management and indirect work processes through the use of artificial intelligence (AI) and the Internet of Things (IoT). We are also engaging in supply chain reform. These efforts include the configuration of harmonized production processes, collaboration through the shared technology framework, and the optimization of order placements through the establishment of the Commercial Aircraft Procurement Center. Over the medium to long term, we will pursue synergies with the MRJ business, developing differentiation technologies that include weight reduction and material development. We are also promoting initiatives into new fields, such as functional components and equipment. Furthermore, we will leverage comprehensive Group strengths, harnessing integrated traffic control systems and component-related synergies with the defense and space business.

In these ways, we aim to flexibly reconfigure our business portfolio. In the defense and space business, we are pursuing three principal growth strategies: overseas expansion, dual-use development (commercial business), and expansion of existing fields. In the first category, overseas development, we will leverage the international joint development know-how and channels we have cultivated through the F-35 stealth fighter and the SM-3 Block IIA (ballistic missile defense interceptor with enhanced capabilities). While this is currently under Japan-US joint development. We will also make use of key technologies cultivated in the defense and space systems business. At the same time, initiatives are underway with the Japanese government toward potential international joint development projects. International companies are also discussing the adoption of MH components for use in overseas equipment. Future initiatives include delivering the F-35 as the first domestically assembled aircraft, building up a track record in this area and preparing to erect an MHI® facility. Regarding the SM-3, in line with government policy we will commence preparation of a joint production system. We will also produce and export components for Japan-US deployment. In the second strategy, dual-use development, in fiscal 2016 we began specific considerations toward adapting cybersecurity technology for control systems in defense products. We are currently assessing potential applications in control systems for power plants. Regarding expansion in existing fields, we will promote attractive business proposals that leverage our leading-edge technologies and track record in the future fighter program and the Patriot system. In satellite launch services, through the price-competitive H3 launch vehicle, we aim to obtain more commercial and overseas orders.

See the section entitled ‘Business Directions at a Key Subsidiary’ regarding the MRJ business strategy.

*MRO&U: Maintenance, repair, overhaul, and upgrade

Operating Environment

In the Tier1 commercial aircraft business, the business environment was characterized by reduced production levels and a downward trend in contract prices from fiscal 2016. As we expect this situation to continue for the foreseeable future, we recognize that strengthening cost competitiveness is essential. Also, ongoing yen appreciation depreciates sales. In the MRJ business circumstances, the market for 70- to 90-seat regional jets is forecast to grow by 4% annually for the next 20 years, to approximately 3,500 aircraft. However, as a competitor is slated to launch a next-generation 90-seat aircraft in 2021, in order to maintain our predominance we will need to catch up with the delay in our development schedule.

The MRJ is the only next-generation aircraft in the 70-seat class. As the defense and space business is largely dependent on government budgets, the scale of this business has remained essentially flat for more than 20 years. This is one issue we face in terms of expanding our scale of business. Another issue is a fragile profit structure in the defense business, which we believe the Cabinet on the Three Principles on Transfer of Defense Equipment and Technology and government consideration of the National Defense Program Guidelines as opportunities to increase the defense business. Similarly, we believe the revision of the Basic Plan on Space Policy and Implementation Schedule and the formulation of the Vision for the Space Industry prevent opportunities in the space business, and we believe these moves will translate to business growth.

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Addressing Social Issues

Cybersecurity Technologies That Protect Infrastructure Control Systems

MHI Group’s Solutions

In March 2016, MHI and NTT concluded an agreement for joint research in cyber security technologies applicable to critical infrastructure control systems. At the same time, MHI opened the Cyber Lab to serve as a base to verify the effectiveness of cybersecurity at power generation facilities and in a broad range of other fields. By combining the high-reliability and safe control technology developed by MHI in the fields of defense and space and the security orchestration technology® developed by NTT, in late November 2016 we completed a prototype of InteRSePT® cyber-security technology, which enables real-time anomaly detection of unknown cyberattacks.

InteRSePT® consists of a real-time network monitoring system and an advanced security management system, and monitors real-time data flows in networks in an integrated manner. The system delivers real-time security measures that place importance on availability® by changing the security mediation rules on each operating state of the target device. This enables protection against cyber-attacks that exploit control commands.

Going forward, MHI and NTT will evaluate the technology prototype at Cyber Lab and verify its adaptability to control systems, to further advance InteRSePT® and expand its application to the operation and maintenance business. We will focus on commercial fields in which availability is essential, such as at thermal power plants and chemical plants.

Cross-Cultural Communications and Training

To restructure the development schedule in the MRJ business, in late 2016 we began actively recruiting foreign engineers with experience in the airframe business, and we have been allocating key roles in our organizational structure to these personnel. As of June 2017, some 2,300 employees were involved in the MRJ business at our three locations. Foreign engineers have reached one third of this number, or around 600 people. At our development base in Komaki, Aichi Prefecture, foreign staff participate in meetings, which are held in English. We are conducting training on cross-cultural communications and training non-Japanese staff on Japanese-style leadership in an effort to facilitate communications and mutual understanding. By building a globally fluent organizational structure and culture, we are working to reinforce leadership and the transfer of authority, thereby accelerating decision-making. At the same time, by fostering open-minded communication and information-sharing, we are enhancing teamwork and speeding up development activities.

MHI is currently developing the H3 launch vehicle in the aim of reducing costs and improving reliability in comparison with the current H-IIA/B launch vehicle. In the development of a launch vehicle, its engine is an important factor affecting reliability, cost, and performance. Ensuring combustion stability is essential in developing a launch vehicle engine capable of generating propulsive power at hydrogen and oxygen combustion temperatures exceeding 1,000°C. In fiscal 2016, a significant improvement in combustion stability was attained through improvement in the injector and resonator by establishing and applying a proprietary combustion stability evaluation tool. By July 2017, a combustion test of the total engine system had been conducted, confirming its technical feasibility. MHI has earned a strong international reputation for the reliability of its launch services, but further cost reductions are an issue. By bolstering cost competitiveness through the development of the H3 launch vehicle, we aim to expand the number of commercial and overseas launch orders.