

## BUSINESS SEGMENT OVERVIEW

## AIRCRAFT, DEFENSE &amp; 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.

## 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 main wings and other structural components  
Complete aircraft (MRJ) offering high levels of efficiency and reliability and outstanding economy

## Defense and Space

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

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

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STRENGTHS

## Commercial Aircraft

New demand for approximately 33,000 aircraft over the next 20 years  
Expected market scale over the next 20 years of around 3,500 aircraft with 70-90 seats

## Defense and Space

- **Defense:**  
Cabinet approval of the Three Principles on Transfer of Defense Equipment and Technology  
Accelerating development and procurement of new products in line with the formulation of Japan's Medium-Term Defense Program
- **Space:**  
Increase in the need for satellite launches in emerging countries  
Under Japan's Basic Plan on Space Policy, domestic market scale expected to grow to ¥5 trillion over the next 10 years  
A growing launch market in line with expanding needs for the use of satellites

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OPPORTUNITIES

## Commercial Aircraft

High degree of reliance on specific customers  
High sensitivity to foreign exchange fluctuations, as business concentrated on overseas customers  
Shortage of experience in aircraft development

## Defense and Space

- **Defense:**  
Limited experience in pursuing and leading projects overseas
- **Space:**  
Inadequate cost competitiveness in global markets

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WEAKNESSES

## Commercial Aircraft

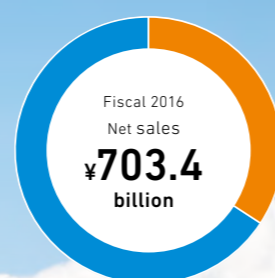
The globalization of aircraft production (business being promoted separately in advanced countries and emerging countries)  
Increasingly stringent competition in the market for regional aircraft  
Ongoing yen appreciation

## Defense and Space

- **Defense:**  
Severe competition with domestic and overseas manufacturers
- **Space:**  
Concern regarding price-cutting by new U.S. companies entering the market for overseas launch services

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THREATS

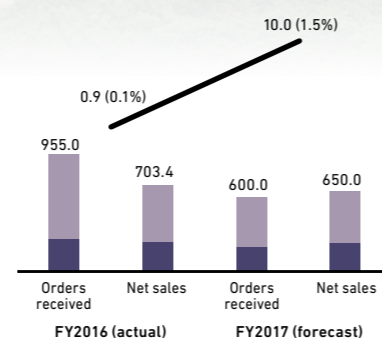
## Net Sales by Core Business



Commercial Aviation Systems  
Integrated Defense & Space Systems

## Operating Performance

Billions of yen



Commercial Aviation Systems  
Integrated Defense & Space Systems  
Operating income (operating margin)

## Operating Environment

In the Tier 1 commercial aircraft business, the business environment was characterized by reduced production levels by customers 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 depresses 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 around 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, we view the Cabinet decision 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 present opportunities in the space business, and we believe these moves will translate to business growth.



## 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 robotics 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 reforms. 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 system synergies 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),

which 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 MHI 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 MRO&U\* 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 missiles. 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 below, entitled "Business Directions at a Key Subsidiary" regarding the MRJ business strategy.

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

## 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 structure 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 MHI'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 organization has also been revised from one led by Japanese employees with foreign advisors to one centered on non-Japanese members of the general manager class. This structural change is aimed at making full use of foreign experts. Simultaneously, the company is reinforcing customer relations to prevent market launch delays from affecting orders already received. Alongside these MRJ Development Team efforts, the Future Advanced Technology Development Team is pursuing the development of further advanced technology from a medium- to long-term perspective. The team is also engaging in technical strategy planning and development of next-generation aircraft concepts.

Development expenses are forecast to peak in fiscal 2019, and we plan to cover these costs with the free cash flow generated by the MHI Group as a whole. Although the payback period will be prolonged, the impact of increased development expenses on profit for each fiscal year should be minimal, and we anticipate virtually no impact on the management of the entire MHI Group.

## BUSINESS SEGMENT OVERVIEW: AIRCRAFT, DEFENSE & SPACE DOMAIN

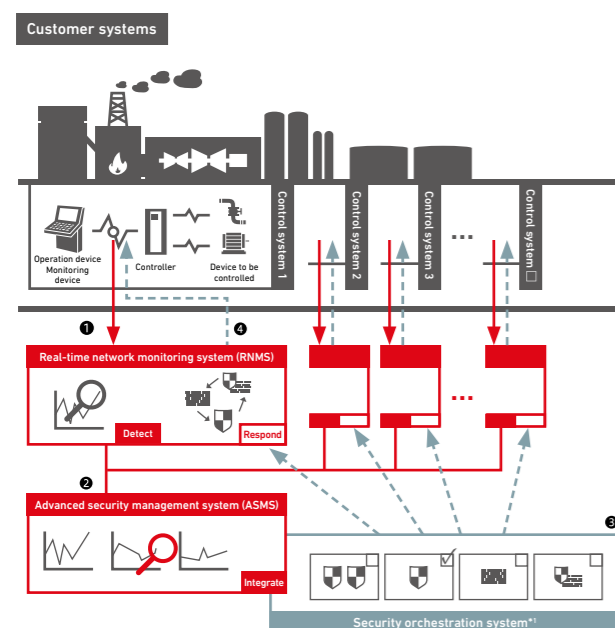
### Addressing Social Issues

#### Cybersecurity Technologies That Protect Infrastructure Control Systems

##### Social Issues

The proliferation of the Internet has led to an increase in convenience, with all manner of systems and large numbers of physical items being connected over networks. At the same time, this connectedness has prompted a sharp increase in cyberattacks, and measures to protect important infrastructure are of particular importance. Effective security measures have been developed to address such cyber threats as malware, including malicious software and computer viruses, and distributed denial-of-service (DDoS) attacks aimed at bringing down systems via a huge volume of data requests. However, recent years have seen a rise in serious malware that monitors the operational characteristics and control commands of equipment being targeted for attack, and then seeks to damage the targeted equipment by altering the timing and content of these instructions. New measures are sought to counter such potential attacks.

##### InteRSePT Framework and Characteristics



##### Targets:

Critical infrastructure such as power plants and transportation systems where continuous availability is of high importance.

- 1 Collects and analyzes packets of sensor information flows in the control system network to monitor the overall operating status.
- 2 Processes the real-time detection data in an integrated manner with the ASMS and monitors the behavior of the entire control system to enable early detection.
- 3 Performs appropriate control over different devices based on integrated security information and changes the communication control rules of the RNMS in response to operational conditions.
- 4 Analyzes and blocks the packets based on rules according to the operating status determined by the security orchestration system/technology.

##### 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 security 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\*1 developed by NTT, in late November 2016 we completed a prototype of InteRSePT\*\*2 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\*3 by changing the security remediation 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.



Cyber Lab

\*1. Security orchestration technology/system: Technologies/systems that collect and analyze cyberattack related information including target device and system status and anomaly events, and comprehensively control diversified security appliances.

\*2. InteRSePT®: Abbreviation of Integrated Resilient Security and Proactive Technology, a registered trademark of MHI.

\*3. Availability: Continuous operation of a system without stoppage.

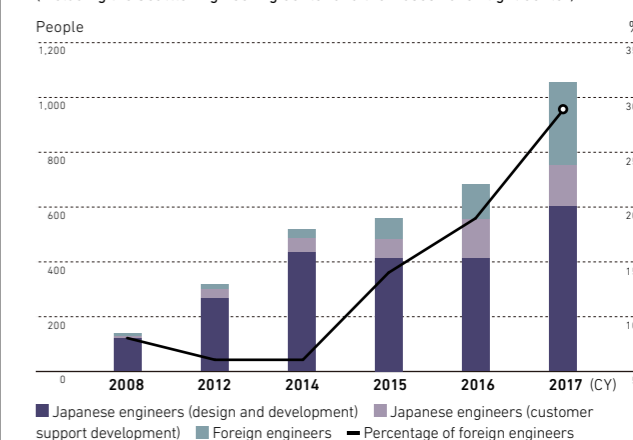
### Initiatives in This Domain Related to Material ESG Issues

Material issue 2: The Use of Global Human Resources

#### MRJ Development Structure Incorporating Foreign Experts

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 2,000 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.

##### Technical Managers and Core Engineers (Including the Seattle Engineering Center and the Moses Lake Flight Center)



Project spearheaded by Mitsubishi Aircraft Corporation

Promotion by MHI Group under a structure headed by the CEO



### R&D Case Study

#### Improving Engine Combustion Stability to Lower Costs and Improve Reliability on the H3 Launch vehicle

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 3,000°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.