

Aircraft, Defense & Space Business Plan

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July 12, 2019

Mitsubishi Heavy Industries, Ltd.

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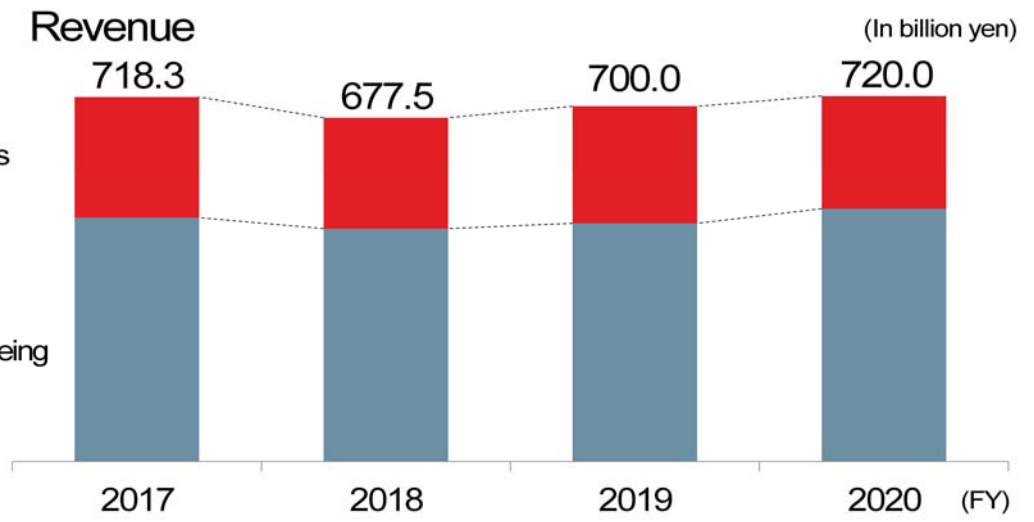
4. Integrated Defense & Space Systems Segment

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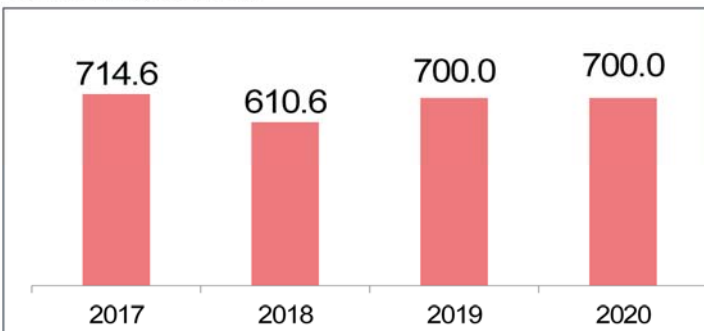
1. Business Overview (FY2018 Results and 2018 Business Plan)

Integrated Defense & Space Systems

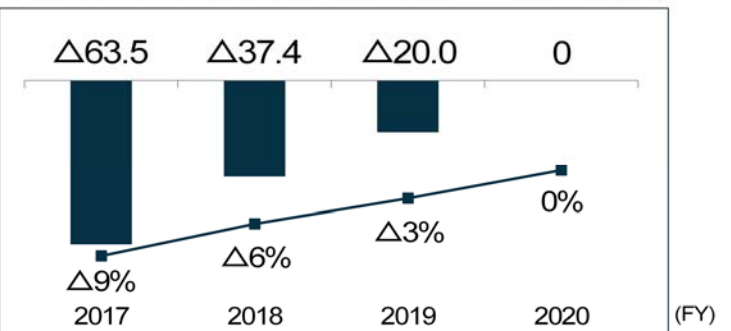
- Naval ships
- Aircraft & missile systems
- Special vehicles
- Space systems
- Commercial Aviation Systems
- Aircraft components for Boeing
- Aircraft components for Bombardier, etc.
- SpaceJet (MRJ)



Orders Received



Profit from Business Activities (In billion yen)



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Thank you for your introduction. My name is Keisuke Hirose, and I am the Commercial Aviation Systems Segment leader. Today, I would like to explain the business strategy of our segment.

Today, I will explain the following four points. Namely, the overview of the business, the management structure, and the progress of the 2018 business plan, as well as our business policies and strategies, in that order.

2-1. Overview

Boeing

787



MHI: main wing boxes



777X



MHI: aft fuselage, tail fuselage and entry doors



777



MHI: aft fuselage, tail fuselage and entry doors



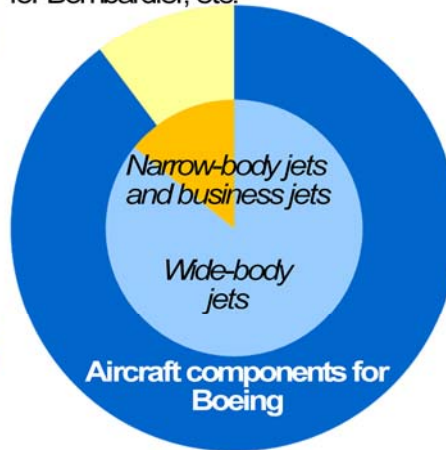
737



MHI: inboard flaps



Aircraft components for Bombardier, etc.



Bombardier

Global 5000/6000



MHI: main wings, center-fuselage and center wing



Challenger 300/350

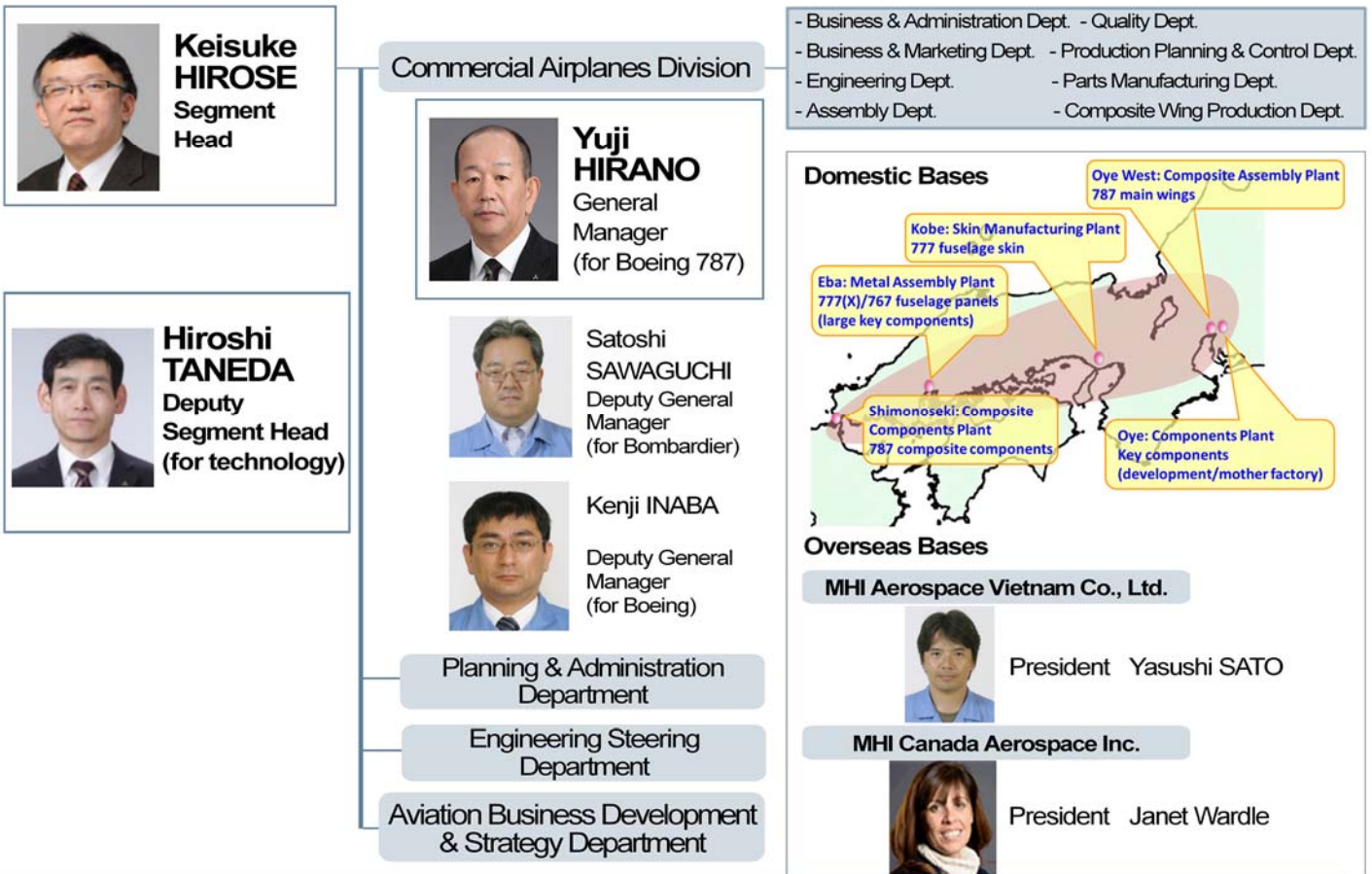


MHI: main wings



First I would like to provide an overview of our business. In the commercial aviation systems segment, we are engaged in the commercial aircraft Tier 1 business, mainly with OEMs such as Boeing and Bombardier. They contract out the production of structure items such as wings and fuselages to us. Currently, we are helping to produce aircraft in the fields of wide body aircraft, narrow body aircraft and business jets, as shown on the screen . For wide body aircraft, we supply the composite main wing boxes for the Boeing 787, and the aft fuselage and doors for the Boeing 777, and its next generation 777X. For the narrow body aircraft, we supply the inboard flap for the Boeing 737 and further the main wings, the center-fuselage and the center wing for the Global 5000, 6000 of Bombardier and also the main wings for the Challenger 300 of Bombardier in the field of business jets. As shown by the pie chart in the center, in terms of sales ratio, the orders from Boeing account for the majority of, and in terms of models, is highly dependent on wide body aircraft.

2-2. Management Structure



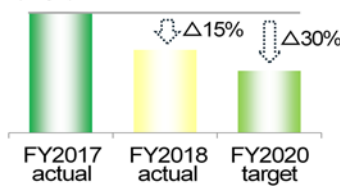
The next slide represents our management structure. I am the segment head and just under me is Hiroshi Taneda, the deputy segment head responsible for technical issues. As explained in the previous page, this segment mainly produces products for Boeing and Bombardier. And, we have three people in charge of each product line as shown on the screen. As for our manufacturing sites, which are shown in the figure on the right, we produce at Oye in Nagoya, Kobe, Eba in Hiroshima and Shimonoseki, respectively. In addition to these, we have production bases in Vietnam and Canada. We are advancing our global supply chain.

Business Environment

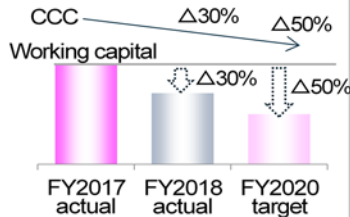
- 1) Market expansion over next 20 years (operating fleets to be doubled)
 - During years of 2018 Business Plan, temporary decrease due to transition from Boeing 777 to 777X. Production to increase from 2020.
- 2) Reduction in contract prices necessary due to fierce OEM sales price competition
- 3) Intensified competition with overseas Tier1 manufacturers

Status of Current Improvements

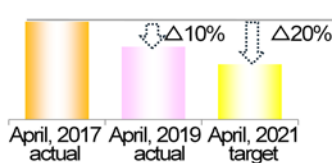
Shorten production lead time (days)



Working capital/CCC



Reduce Fixed cost



Sales to decrease, but earnings to be maintained through higher productivity, fixed cost reductions, etc.

2018 Business Plan Progress

1. Strengthen cost competitiveness to withstand severe business environment

Promote automation and manpower saving

- Introduce automated equipment
- Automate indirect operations through AI/IoT
- Continue ongoing improvement activities



Automated assembly line for 777X
787 wing boxes production line for 14shipsets /month production

• Build global production structure

- Enhance supply chain in North America and Asia

2. Expand into areas with differentiated competitive advantages

• Targeting new Tier1 structure packages

- Advanced materials (composites)
- Advanced engineering /manufacturing processes (metal processing)

3. Expand into new areas

• High value-added products (Components)

- Operation support
- Electrification

Next is the state of progress for the 2018 business plan. I would like to explain in order – the business environment, status of current improvements, and the 2018 business plan progress.

Regarding the business environment for the current 2018 business plan term, the number of aircraft manufactured temporarily decreased due to the transition period from 777 to 777X. But as a whole, within the next 20 years, the commercial aircraft market is expected to double in terms of operating fleets. We consider this market to be a growth market. On the other hand, due to fierce price competition among OEMs, pressure for price reduction is increasing, and at the same time competition with overseas Tier1 manufacturers is also intensifying. Therefore the business environment is getting more and more difficult. In these business environments, we have tried to improve production lead times, reducing working capital, shortening the cash conversion cycle and reducing fixed costs. As a result of these activities, although sales may decrease, we will be able to maintain earnings.


To execute the 2018 business plan, we will continue to strengthen cost competitiveness to withstand severe business environments, promoting automation, saving manpower, and establishing a global promotion structure. In addition to these activities, by expanding into new fields with differentiated competitive advantages such as advanced materials and advanced engineering and manufacturing processes, we will aim to acquire a new Tier 1 package.

Also, we will expand our business into new areas such as operational support, electrification and into high value-added products, like components.


I would like to explain in further detail on the next page.

2-3. 2018 Business Plan Progress Status (2/3)


Established 14shipsets/mo 787 Composite Wing Production. Further Lean production by Automation.



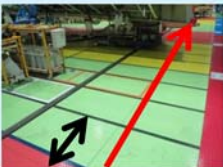
Expansion of Auto-drill (Flowtime Reduction)




Unmanned wing transfer (Expand Automation)



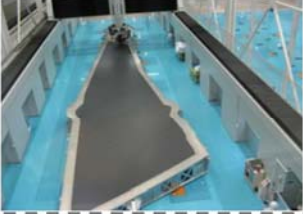
Moving Line for System Installation (Flowtime Reduction)




Champion Time Competition @Shop Floor




Composites factory




Reduction of Composite Lay up Inspection (Process Control)



Next Generation Composite Lay up Machine



AI/IoT Application to Inspection



Expansion of Real-time Production Monitoring

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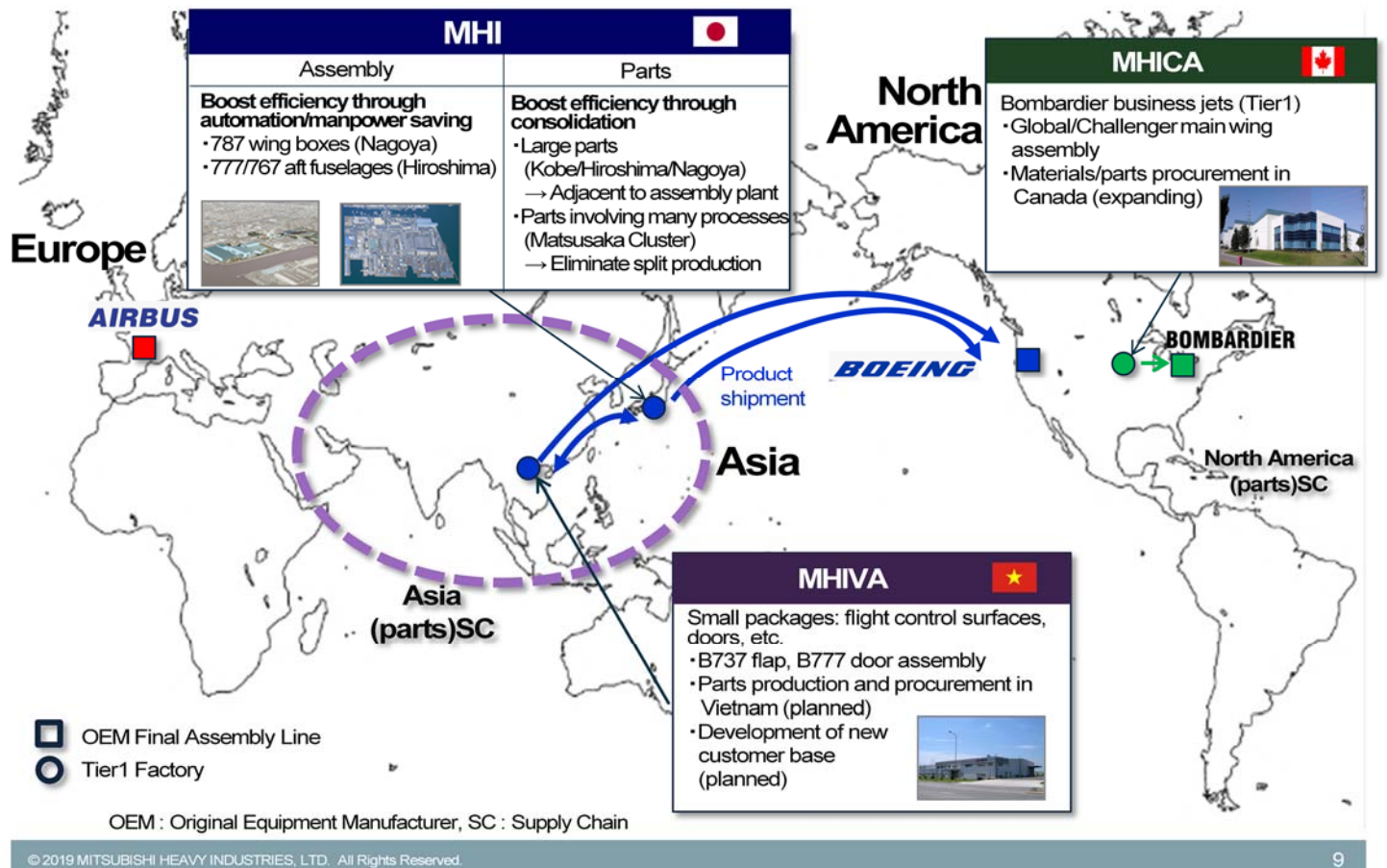
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First of all, I would like to talk about strengthening our cost competitiveness to withstand business environment changes. What you are looking at here is a composite wing production line for the Boeing 787, which increased production to 14 aircraft a month from January this year. The flow of manufacturing is from front to back. In this production line, we are promoting the application of automated technologies such as the expanded application of automated drilling machines to wing panels, unmanned operation of wing transfers, and the introduction of moving lines in the process of system installations. Also, at the composite plant that supplies parts to this production line, we are promoting automations to reduce inspection times of composite lay-up inspections using process control technologies, introducing next generation composite lay-up machines, and applying AI, IoT technologies to inspection work.

Further, we are expanding the application of real-time production monitoring. In addition to these automations and labor-saving efforts, onsite champion time competitions are also conducted. We are also promoting steady improvement activities. Through these activities, we will further improve the productivity of the Boeing 787 wing.

2-3. 2018 Business Plan Progress Status (3/3)

Aim for global structure to meet OEM expectations, enhancing supply chain in North America and Asia



Next, I will explain our global production structure.

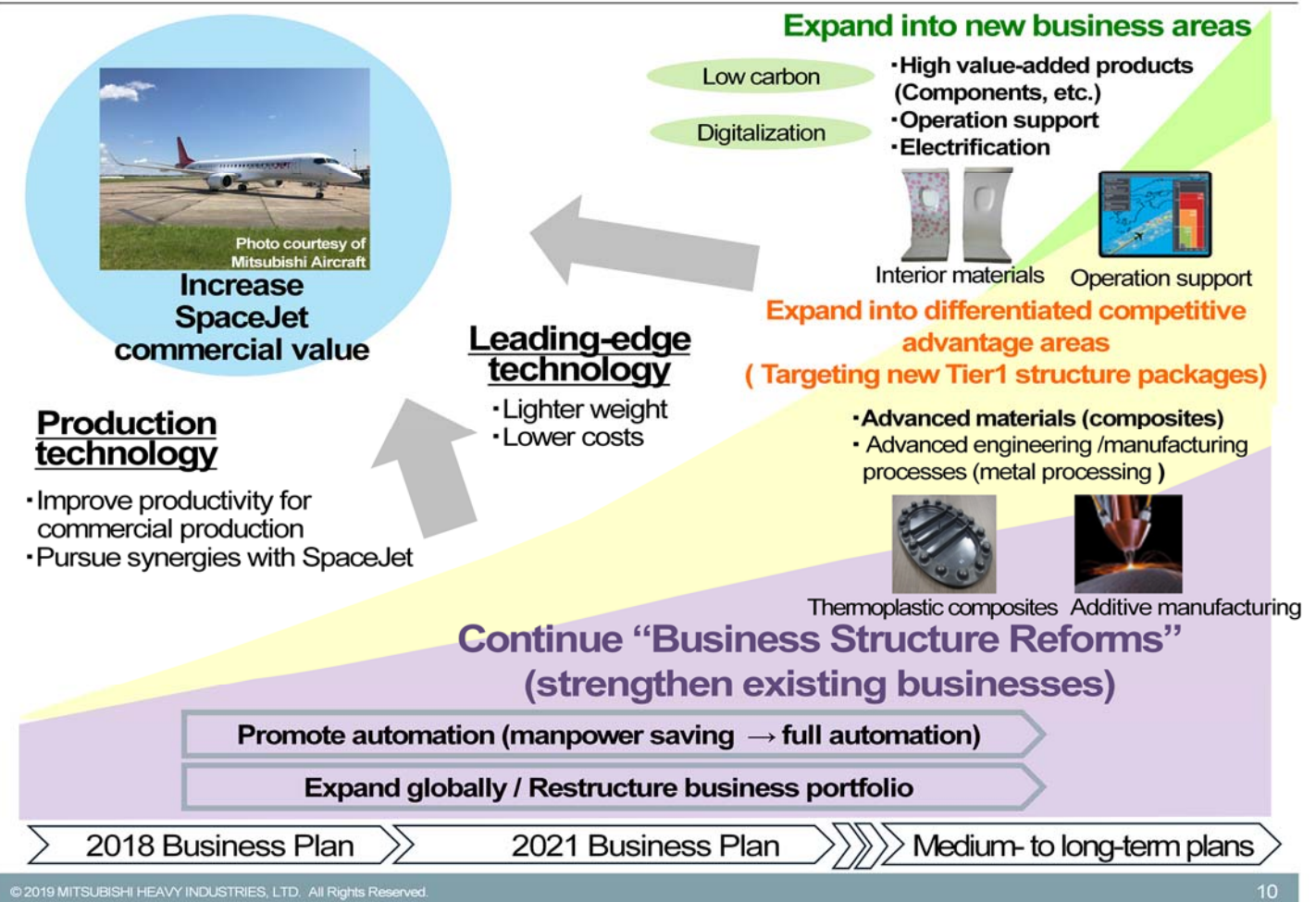
In the assembly of structured parts, we manufacture the large parts in Nagoya and Hiroshima. In Nagoya, we manufacture the wing boxes for the Boeing 787 and in Hiroshima we manufacture the aft fuselage of the Boeing 777 and 767. For these large parts, we thoroughly pursue efficient production. As for the main wing and other components for Bombardier's Global 5000 and 6000, we manufacture them in Toronto, Canada, near Bombardier, which results in reduced time and cost for transport.

Products that are relatively small and not suitable for automation, such as the flaps for the Boeing 737, are produced in Vietnam, utilizing rich low-cost labor.

With regards to the parts supplied for assembly work in Japan, we are working to streamline parts production by consolidating plants. As for large parts, we improve shortening production times, and developing factories adjacent to assembly plants. As for small and medium sized parts, we participated in "an effort to intensively produce multi process parts in one place" at the Matsuzaka cluster, and we are promoting elimination of straddles in production.

In North America, local procurement of materials and parts is also expanding mainly for Bombardier business jets. In the Asian region, we are currently considering expanding local parts production and parts procurement to further expand Vietnam's low-cost production basis.

2-4. Business Policies and Strategies



Lastly, I would like to explain our medium-term business policies and strategies. As explained already, we will continue business structure reforms such as promoting automation and global business deployment. We will also work to strengthen our existing businesses.

In addition, by expanding into new areas with differentiated competitive advantages such as advanced materials and advanced engineering and manufacturing processes, we will aim to acquire a new Tier 1 package. We will expand our business.

And we will apply these production and leading-edge technologies to improving product capabilities of the Mitsubishi Space Jet family which we are currently working on.

And in order to advance into new business fields, we will promote to development of operational support, electrification and high value-added products, like components.

We will work on the diversification and development of the whole of the commercial aviation businesses which is recognized as a growth business.

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3. MRJ Business

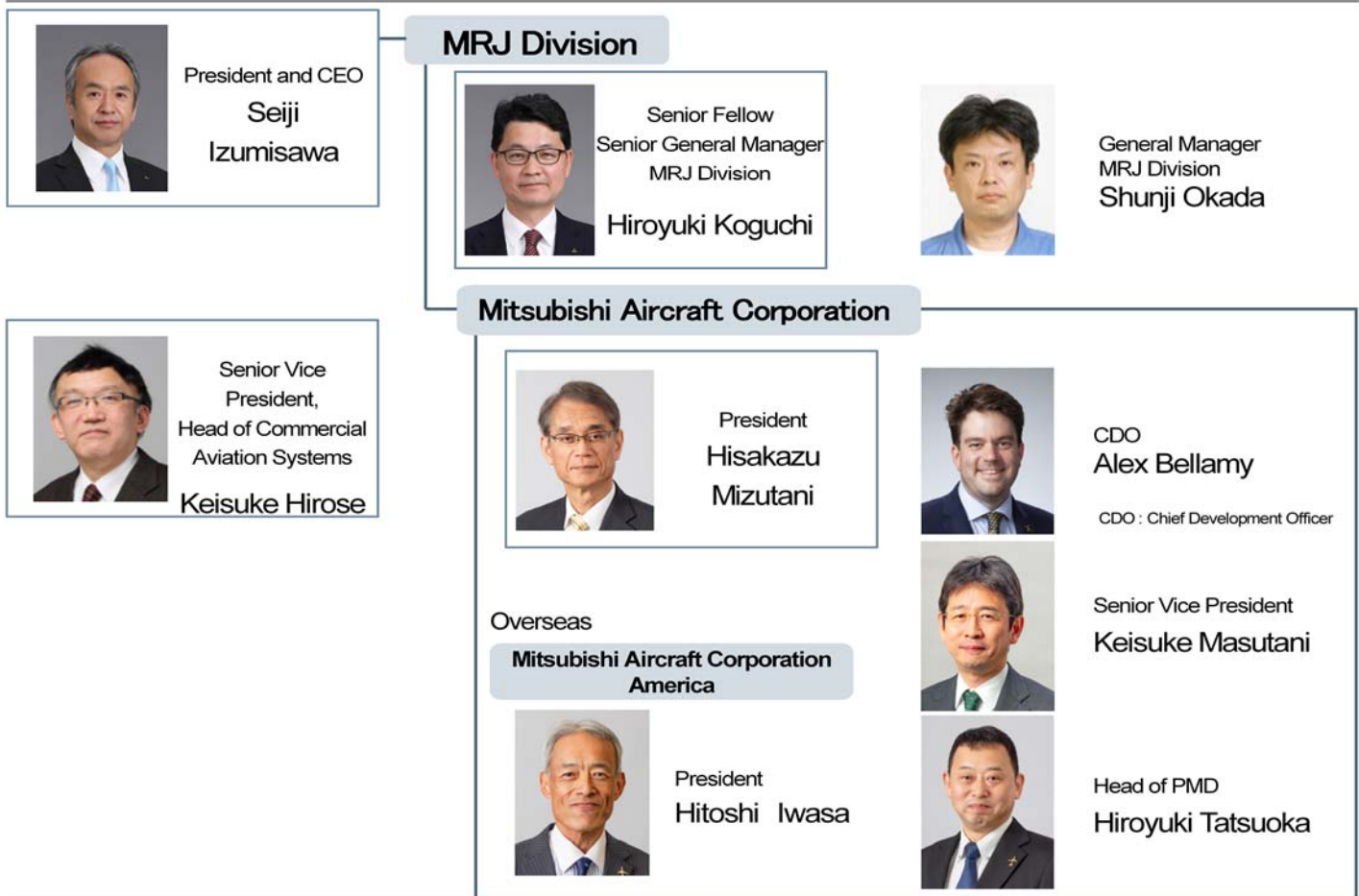
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- 3-2. Progress Towards First Delivery 2020
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Thank you for your introduction. My name is Hiroyuki Koguchi, and I would like to speak about our MRJ business.

3-1. Driving the MRJ Business (Organization)



First, allow me to provide you with a quick overview of our management team. The MRJ Division is directly managed by the President and CEO, Seiji Izumisawa. Within the division, we have the Mitsubishi Aircraft Corporation. The structure is such that we are able to work on mass production equipment as well as test equipment, procurement, quality assurance, and business promotions. Within the division, we have all of the aforementioned departments. Mitsubishi Aircraft Corporation is responsible for engineering development, customer support and sales. These activities were developed and implemented by the Mitsubishi Aircraft Corporation President, Hisakazu Mizutani and Chief Development Officer, Alex Bellamy. Keisuke Masutani is our Senior Vice President and Hiroyuki Tatsuoka is our head of Program Management Division. In addition, we have overseas sites for Mitsubishi Aircraft Corporation America, of which Hitoshi Iwasa has assumed the position of President, as well as head of the Moses Lake Flight Test Centre. This program is very large in size and complex in structure. Some decisions regarding the program can be very urgent and require discussions with the MRJ Promotion Committee, which is lead by chairman, Shunichi Miyanaga, and president Seiji Izumisawa.

Driving the MRJ Business

Continue Focus on Obtaining TC

Establish a Customer Support System

Develop an Optimal System to Support a Synergized Production

Develop a Mainstream Product for North American Market and Enhance our Service System

TC: Type Certification

How we plan to drive the MRJ business is shown here. There are four pillars, or core parts, with which we promote the MRJ business. The first initiative is to continue focusing on obtaining TC (type certificate). The M100 is a new type which will be explained later on, but we have been working on obtaining the TC for, and delivering, the MRJ90. Achieving this will lay the foundation with which we are able to build upon in starting the process for the M100, and would be the most important driver for our advancement in efforts towards the next stage. The next pillar is to establish a customer support system. We already delivered a flight simulator to Haneda airport in June, for our launch customer, ANA, and have begun preparations for supplying spare parts' inventories and providing customer support. The third pillar of driving the MRJ business is to develop an optimal system to support synergized production for tier 1 businesses and the other businesses. So, synergy between this tier 1 business and other related businesses should be put into actual production. At this moment, as has already been explained, we are proceeding with the tier 1 business, as the 787 production line is in operation. Additionally, in Hiroshima we have the Boeing 777X automated assembly line, in addition to other lines, and have accumulated IT capabilities and simplified our production processes for Boeing 787 lines, as well as others. So again, the horizontal deployment of accumulated expertise should be made while at the same time having a mass production system in place which enables us to meet our customer's expectations and delivery deadlines. The fourth pillar is to develop a mainstream product for the North American market and enhance our service system. This is directed towards the M90, the MRJ90 based system. So, the commercial properties for that should be based on M90 to enhance competitiveness. So, the Mitsubishi SpaceJet M100 will be launched. We have been working on the development of M100. And I would like to explain the status surrounding the development from the next page onward. Please, move onto the next page.

3-2. Progress Towards First Delivery 2020

FY2018 Achievements

- ◆ Demonstration flight at Farnborough Air Show
- ◆ Obtained TIA from JCAB
- ◆ Type Certification (TC) flight tests started
- ◆ Received LOA from FAA
- ◆ Achieved approximately 2,700 flight hours



FY2019 Initiatives

Development

- Accelerate TC flight test with additional Flight Test Vehicles
- Prepare a customer support system for First Delivery



Paris Air Show

- Announcement of Mitsubishi SpaceJet Family
- Introduced new concept "M100"

TIA: Type Inspection Authorization LOA: Letter of Authorization (Notice from FAA to its Pilots and Staffs to authorize on boarding to SpaceJet as a part of TC related activity)

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This slide is about the progress towards the first delivery of aircraft in 2020. First let's look back at fiscal year 2018's achievements, and then forward to the initiatives we have for this year, fiscal 2019. For achievements in 2018, we had a demonstration flight at the Farnborough Airshow that allowed our customers to see firsthand how quiet and full-efficient our engine was. And then, from the Civil Aviation Bureau, we obtained the TIA, which stands for Type Inspection Authorization, with which enables us to start the aviation test that serves as the foundation for obtaining the TC. That was something we obtained at the end of last year. Starting in 2019, we began working on the TC flight tests in Moses Lake. We then received a letter of authorization, or LOA, from the Federal Aviation Administration, FAA, and have since achieved approximately 2700 hours of flight.

Now, if you take a look at the pictures on the left side, you'll be able to see our aircraft going through a snow blowing and freezing fog test at the McKinley Laboratory, as well as a cross-wind test in the picture at the bottom. The entire body of the aircraft had been covered and then exposed to extreme temperatures of negative 40 and positive 50 degrees, to ensure the engines maintained functionality and that the doors opened and closed. Utilizing the US laboratory site, we were able to conduct many tests such as these. Then, we looked into the cross-wind test. We chose the timing and then tried to see whether landing and take-off was affected by winds coming from each side of the plane. On the right side of the slide, you can see our initiatives for 2019, in which we plan to further test for TC. We plan to accelerate the TC flight test with additional flight test vehicles. We have prepared three planes – the 10, 7 and 11, for testing. So, we have to make sure that all three aircraft are ready for the final TC test in order to accelerate the process for acquisition. Please take a look at the top picture on the right. This is the number 10 aircraft being prepared. You can see the engines, the tail, as well as others. They are all put together and then we have to work on the in-carrier fitting, and are in a very final

stage of fitting all these features necessary for functioning. Then on the very far right-hand side, you see a grey, box-shaped piece of equipment. This is the flight simulator that I spoke about earlier. This was already delivered to ANA in June. And then, we made our demonstration at the 2019 Paris Air Show. At the time, we used aircraft number 3 for the test flight, and unveiled the new design and branding of the Mitsubishi SpaceJet family, as well as the new concept of the M100, which is a major advancement over MRJ70.

• TC Tests

- TC Engine & APU test
- TC Cold temperature test
- TC Anti icing system test
- TC Fuel system test
- TC Avionics test



APU: Auxiliary Power Unit

Moving on to the next page. This page shows our progress and achievements for the TC test. I will be brief. These are the tests conducted in the United States; the TC engine test, APU, the driving equipment test and also, as was shown on the picture, we had a cold temperature test, sensor tests, specifically for the tip of the equipment and facilities. This is an anti-icing system test. In very high altitudes, it tends to get very cold and some of the equipment can experience icing. For this defrosting capabilities were tested. TC fuel system tests, and avionics tests were also conducted to check the software and hardware that control the aircraft. This was also tested for the TC acquisition. As of the end of June, we have conducted 3000 hours' worth of testing for flying. And much of these tests are being done in Nagoya, not Moses Lake – like the fatigue test, in which 10,000 cycles was conducted on the 4th of July. That was one of the requirements by the TC that has already been completed.

3-3. Commercialization - New brand: Mitsubishi SpaceJet Family



- Naming to emphasize product value, instead of “Regional” market segment
- Provide “Spacious and Wide Cabin & Overhead Bin”, “Ultimate Comfort”, “Environment-friendly” and “Excellent Economics”
- Introducing the “Mitsubishi SpaceJet” family, branded with “Mitsubishi”



M90

Designed for 76-92 Seats
(The foundation of SpaceJet Family)



M100

Designed for 65-88 Seats
(Comply with US Scope clause)



M200

Designed for up to 100 Seats
(Under consideration)



SPACEJET
Space where it matters

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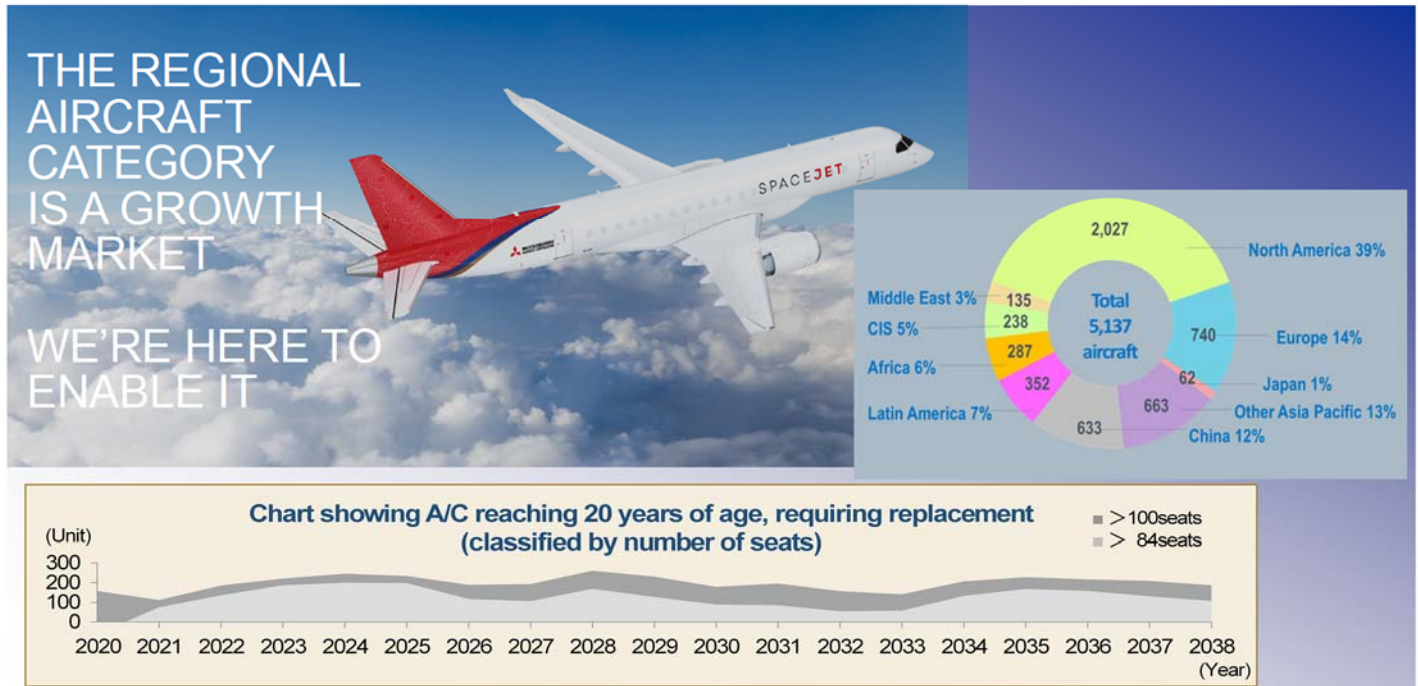
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Next page. From this page onwards, I would like to share with you our new brand. We have changed our regional jet branding from the MRJ to the Mitsubishi SpaceJet family. To give you some background, the M100 is a new aircraft that we are developing. The MRJ70 is a conventional aircraft and is based on the MRJ90. In terms of commercial viability, space arrangement and cabin space have been greatly widened. So, it has undergone a very positive change in terms of commercial value. Manufacturers use regional as a classification term, and of course, that is a direct representation of its market. But perhaps this wording “regional” does not accurately portray the characteristics of the product. We believe we needed to have a brand name that would truly incorporate the space utilization features. It’s been 10 years since we have launched the aircraft business. We believe now is perfect timing to change the brand name, and that is the reason why we have done so. SpaceJet is the new name, and this new branding will be something that helps us really push forth the value of the product. It has a fairly spacious and wide cabin, wide aisles, and the overhead bin is quite wide as well. It can accommodate a lot of luggage. It is highly advantageous in comparison to conventional models. That is exactly the point we would like to solicit behind this brand name of Mitsubishi SpaceJet. If we take a look at the new brand coloring for the aircraft a moment, we can further realize the meaning within the design. For the coloring, initially we used lacquer with the MRJ, which provided a traditional Japanese image and inspiration for the design, but we have since decided to improve the design to better fit our new branding. The tail wing of the SpaceJet, colored in red, represents the coloring of the Mitsubishi logo. The sky blue, we imagined to represent ANA, our launch customer. Previously, we used black, red and gold for the MRJ. We decided to reduce the amount of gold coloring in the SpaceJet. If we take a closer look at the detail on the tail, we can see a Karesansui design, a traditional Japanese pattern used in rock gardens to represent mountains and water. We

used gold as the highlight against the gorgeous red background. That's the reasoning of why we have come up with these colors and design for the newly branded plane. Now that the brand has changed to Mitsubishi SpaceJet, likewise with the corporate brand name, we have also changed the naming of the aircraft. The M90 used to be the MRJ90, but beyond that, naming of the aircraft is now completely free from the concept of seating. The MRJ90 and 70 were the previous names used, but now we have changed them to the M90, and M100 to represent the different models. And, the M200 will be the possible name once we develop a larger aircraft. Naming the planes in this way represents performance of the aircraft and that is why we used the name M100. The "70" in the MRJ70 represented the maximum seating amount, but the new model now has a wider range of seating arrangements. It can accommodate up to 88 seats. That is why we are no longer confined to the seating in naming the models.

Mitsubishi SpaceJet Family

- 5,000+ regional jets (100 seater and below) in demand for coming 20 years
- Strong and stable demand for replacement - as many as average 200 per year
- Two family models: M90 with 76 - 92 seats and M100 with 65 - 88 seats to set a new standard in the RJ segment



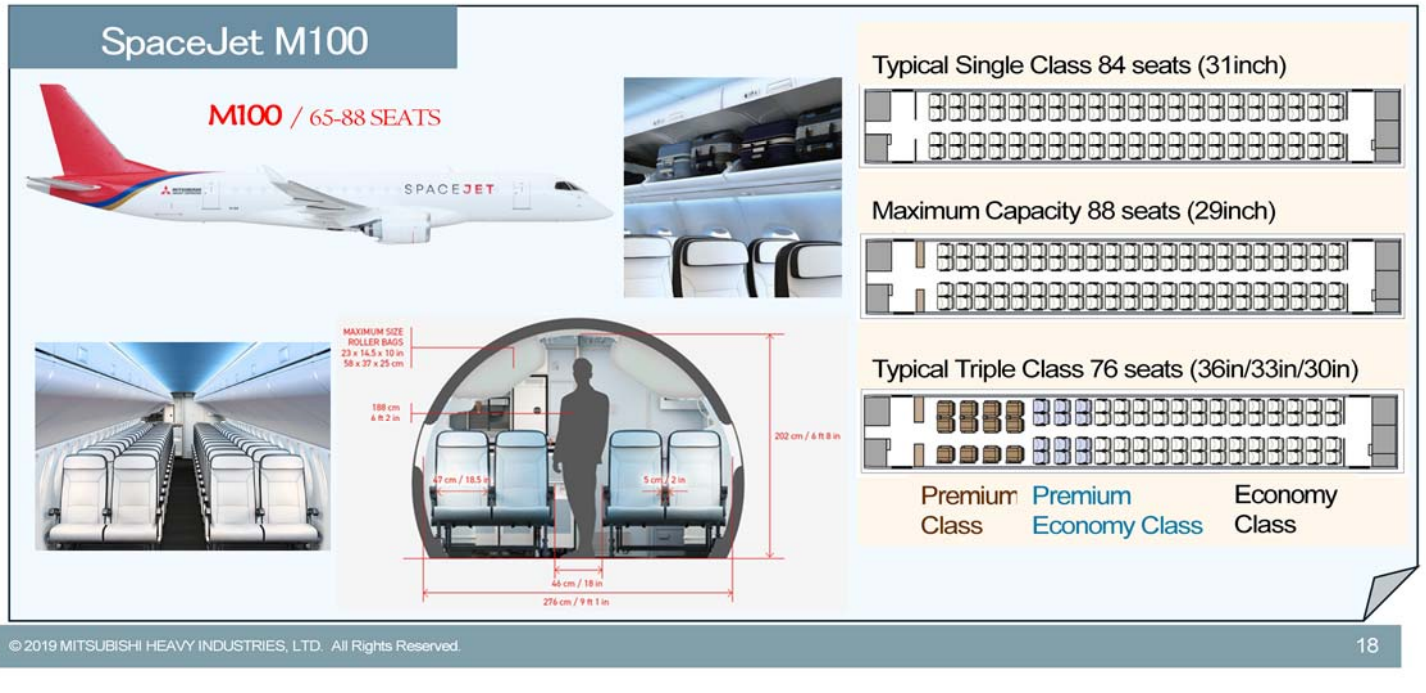
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What are some of the possibilities for the M100 model? We have shown a glimpse of the market in this graph. For aircraft with 100 seats or less, in the next 20 years we expect to see demand for more than 5000 regional jets. The graph below shows the demand trend. Typically aircraft aged 20 years or more are retired or phased out. The bottom graph shows the demand projection resulting from the retirement of these 20 year-plus regional jets. Units are noted on the vertical axis, and the year is noted on the horizontal. In 2020 we expect demand for 200 or so jets with under 100 seats. For 2020 and onwards, in terms of replacement demand, we do not expect to see any dips. In fact, we believe this trend will continue for some time. In the pie chart, note the breakdown for demand by geographical region. North America accounts for the largest market, and is followed by Europe and then Asia. These are exactly the areas in which we will pursue going forward. In addition to this market climate, competitors are beginning to show movement as well. As many of you are already aware, Embraer will be teaming up with Boeing in the regional market for 100 seaters or smaller regional jets, and will focus on developing aircraft slightly smaller than the 737 and Airbus 320. The E1-175 was a direct competitor to our MRJ90, that has been our assumption, but now they have been looking into the E2-175. They seem to be exploring the possibility of this model as well, so we need to watch this carefully. As far as Bombardier is concerned, we focused on the CRJ. Back in 1990s since they launched the CRJ they have stretched the fuselage, but have not been able to develop a new generation model. And this time around, the CRJ program is expected to release from Bombardier the Q400, a turbo propeller craft and the A220, that has been given to Airbus. Bombardier has decided to exit from these programs. They have clearly stated that they will be making an exit from the commercial aircrafts. For this 100 or less regional jet market, we have the E1-175, that is the only aircraft available in this specific market. If we can introduce the M100 to this specific target, this will be the sole next generation aircraft. We believe we do have a fair chance to win in this particular area.

3-3. Commercialization - SpaceJet M100 Product Study

SpaceJet M100

- Designed with excellent performance, adapting to wide range of market needs. Perfectly matches US and global market
- Complies with Scope Clause with 65 - 76 seats three-class cabin configuration, and expandable to 88 seats single-class. Industry leading operational economics and array of cabin options allows the product to flexibly meet various needs across the globe



SpaceJet M100
M100 / 65-88 SEATS

Typical Single Class 84 seats (31inch)

Maximum Capacity 88 seats (29inch)

Typical Triple Class 76 seats (36in/33in/30in)

Premium Class Premium Economy Class Economy Class

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The image contains several diagrams and photos of the SpaceJet M100. At the top left is a side view of the aircraft with 'M100 / 65-88 SEATS' written on it. Below that is a photo of the cabin interior showing rows of seats. To the right are three seat layout diagrams: 'Typical Single Class 84 seats (31inch)', 'Maximum Capacity 88 seats (29inch)', and 'Typical Triple Class 76 seats (36in/33in/30in)'. The triple class diagram is labeled with 'Premium Class', 'Premium Economy Class', and 'Economy Class'. At the bottom center is a circular diagram showing a person standing in the cabin aisle with various dimensions: 188 cm (6 ft 2 in) for cabin height, 47 cm (18.5 in) for seat pitch, 5 cm (2 in) for seat width, 44 cm (18 in) for seat depth, and 276 cm (9 ft 1 in) for cabin width. A note indicates 'MAXIMUM SIZE ROLLER BAGS 23 x 14.5 x 10 in / 58 x 37 x 25 cm'.

Let me give you some more details about the features of our aircraft, the SpaceJet M100. The SpaceJet M100 was built to exhibit superb performance and accommodate the needs of various markets. The mainstream market for the aircraft, as of now, is the United States. With regards to seating, the scope clause in the US calls for 76 seats, but we are capable of accommodating aircraft with a range of 65-88 seats. You can see the seating arrangement at the bottom of the slide. Recently, even in the regional jet market, there has been a push to increase the ASP for passengers. Most aircraft offer business, premium economy, and economy, as a typical three-class cabin configuration. From that perspective, the M100 can accommodate the three class configuration with wider seating and adjustable seat pitch. We don't believe it will happen for some time, but once the scope clause has become more relaxed, chances are airlines may have to change aircraft to increase the total number of seats. The fact that the M100 can be configured to accommodate 88 seats, would enable it to meet the future demand of customers, should scope clauses/demand change. This graphs show the pitch of the seating and the height of the cabin, which showcases our overhead-bin luggage space. As you can see, there is quite a bit of space for luggage. These are the areas in which we are finalizing specifications and would like to solicit to our customers.

Acquire CRJ Program from Bombardier Inc.

**Acquire Customer Support, Marketing, Sales, and
TC from CRJ program
(including US service centers)**

**Complement the Development, Manufacturing,
Sales, and Customer Support for Mitsubishi
SpaceJet family**

**Expected transaction closing during first half of
2020 (subject to regulatory approvals and
customary closing conditions)**

This is the final page. Next is regarding the Bombardier CRJ program, and forging a business transfer contract. June 25th was the date we announced this. For Bombardier, they call it the commercial jet business. The CRJ program will be acquired by us. Of course, we have to wait for the final approval. We will be acquiring customer support, marketing, sales and TC from the CRJ program. The production site and plants in Canada will not be part of the acquisition. In terms of production, CRJ program still has some backlogs. For those, we will manufacture them on a consigned basis. There is no longer development on actual aircraft and therefore we will not be carrying out development functions. So, as you can see in the first text box, it says "including US service centers." For customer support, we believe some of the largest assets within the CRJ program are the customer support functions in Arizona and West Virginia. In these two areas, which cover the west and east coasts of the US, they have maintenance, repair, and overhaul bases. They have hangars as well, which will allow for aircraft to be brought in for maintenance, conducted by highly skilled workers. So, the majority of repairs can be conducted and approved by local authority as well. Hence, we will not be replacing the service centers which are of high value in terms of assets. Without these CRJ programs in place, we would have the liability to operate them on a standalone-basis. However, from day one we need to maintain our airworthiness. So, from day one, we have to ensure that we provide support to customers. That would be the most important mission for us, airworthiness needs to be retained. One thousand two hundred aircrafts or so are already in operation. Of course, we need to continue to support these aircrafts as well. Once the acquisition is complete, it will complement the development, manufacturing, sales and customer support for the Mitsubishi SpaceJet family. These programs already in place will only enhance the reliability of our SpaceJet business. Finally, you may be wondering when this transaction will be complete. We are currently undergoing anti-monopoly inspection by various authorities, so we are looking at the first half of 2020 as the expected transaction closing date. And, that is all I have. Thank you very much.

1. Business Overview

2. Commercial Aviation Systems Segment

- 2-1. Overview
- 2-2. Management Structure
- 2-3. 2018 Business Plan Progress Status
- 2-4. Business Policies and Strategies

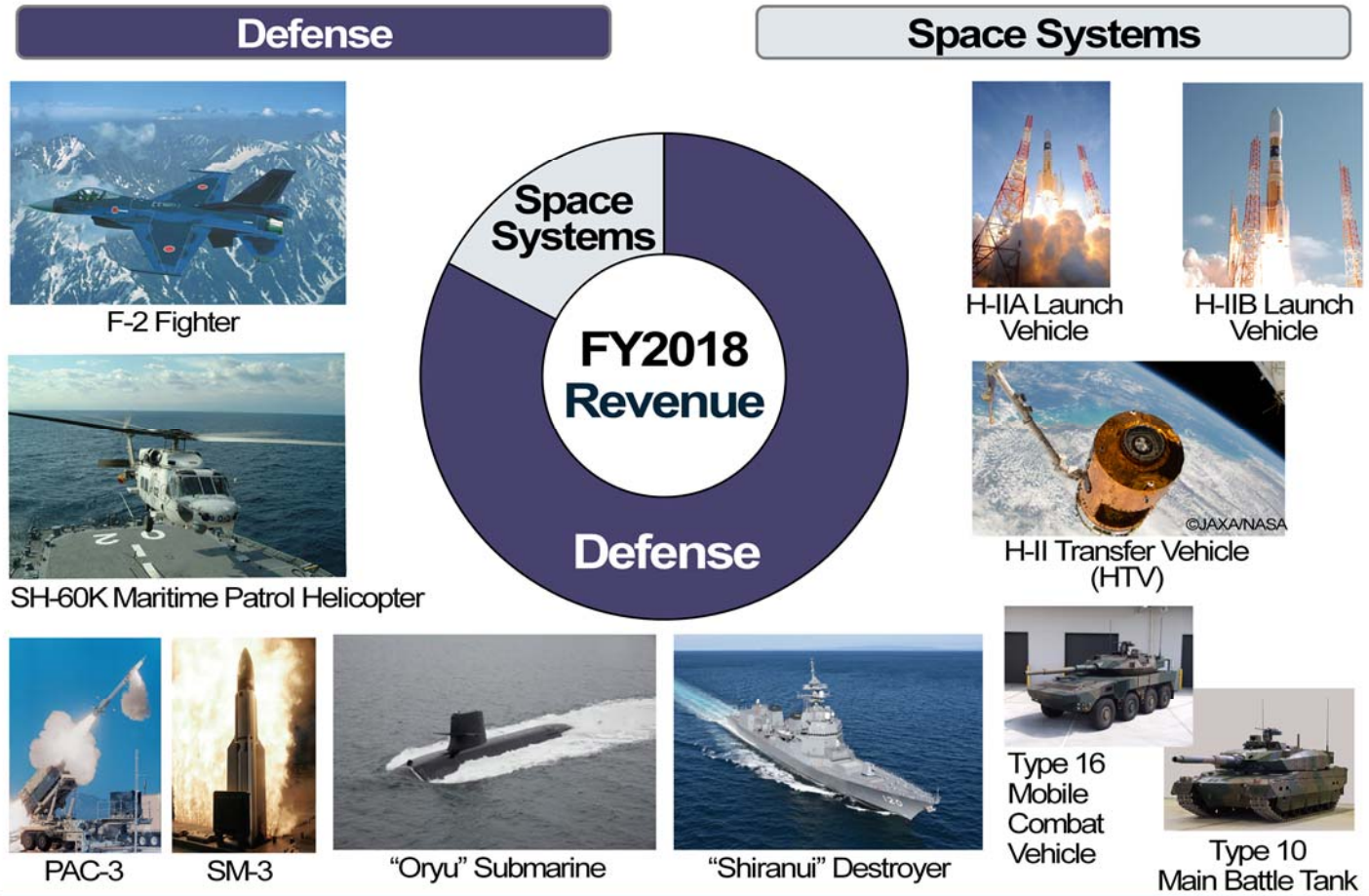
3. MRJ Business

- 3-1. Driving the MRJ Business
- 3-2. Progress Towards First Delivery 2020
- 3-3. Commercialization

4. Integrated Defense & Space Systems Segment

- 4-1. Overview
- 4-2. 2018 Business Plan Progress Status
- 4-3. Measures Targeted at FY2021 and Beyond

Hello, my name is Koji Abe and I am from the Integrated Defense & Space Systems. First I would like to provide an overview of our segment and then I'd like to speak about the progress of the 2018 business plan, and finally our targets for FY2021 and beyond.



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So, here is a snapshot of the segment. Our product line includes fighters, helicopters, missile systems, submarines, destroyers, and combat vehicles. Of course, we have space systems as well. In terms of overall revenue, space accounts for about 15% of the total in the segment.

Management Structure



Naohiko ABE
Senior Vice President,
Head of Integrated
Defense & Space Systems



Keiji SAKURAI
Senior Fellow
Senior Chief Engineer
(Future Fighter)



Mitsuru HAMADA
Senior Fellow
Senior Chief Engineer
(Special Affairs)



Hiroshi ARAKAWA
Senior Fellow
I & I Domain Senior Chief
Engineer
IDSS Senior Chief Engineer
(Acting)

Product Lines

Functions

<Defense>



Masashi MORITA
Vice President and
General Manager
Aircraft & Missile Systems
Division



Motohiro KITAGAWA
Senior Fellow
Vice President and
General Manager
Naval Ships & Maritime
Systems Division



Hitoshi SHIRAISHI
Vice President and
General Manager
Planning & Administration
Department



Takashi OKAZAKI
Vice President and
General Manager
Special Vehicle Division



Koji ABE
Vice President and
General Manager
Advanced System
Programs Department

<Space Systems>



Masahiro ATSUMI
Senior Fellow
Vice President and
General Manager
Space Systems Division



Takashi FUJII
Vice President and
General Manager
Procurement
Department

Here is our current management structure. Last year, we had two divisions, the Naval Ship Division and Maritime Systems Department, separately. This year, we integrated these divisions into the Naval Ship & Maritime Systems Division. As a whole, we have organized our operations in the areas of land, sea, air and space.

Defense

- **SM-3**

2018 Oct, Dec

Successful flight test of anti-ballistic missile
(U.S. Department of Defense)

- Development has been completed -



©MDA

- **Multi-Purpose Compact Destroyer**

2018 Oct

Orders received for 2 vessels



- **Christening and launch ceremony**

2018 Oct

Submarine "Oryu"
(Kobe)



- **Delivery ceremony**

2019 Feb

Destroyer "Shiranui"
(Nagasaki)



Space Systems

- **Launch vehicles**

1) Launch of H-IIA/B

2018 Jun H-IIA No. 39

Sep H-IIB No. 7

Oct H-IIA No. 40



2) Launch services

2018 Dec

Agreement with Inmarsat
(UK) on H3 launch after 2022



3) H3 (First launch scheduled for FY2020)

2019 Jan

Started 1st-stage BFT
(battleship firing test)



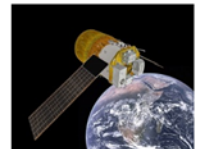
- **HTV**

2018 Sep No. 7 Launch

Nov No. 7 Re-entry

**HTV-X in detailed design
underway**

**(No. 1 scheduled for launch on
H3 in FY2021)**



©JAXA

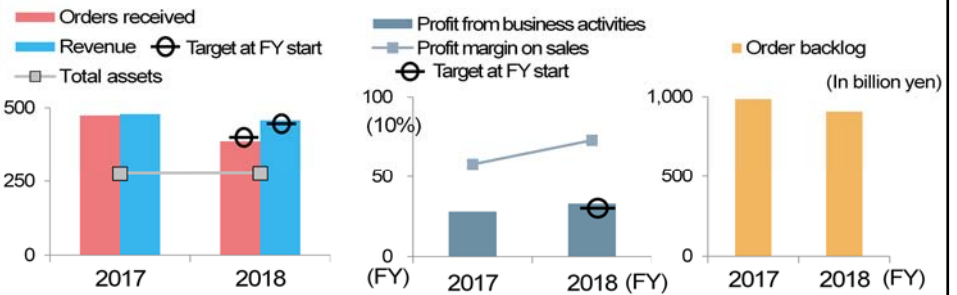
The next slide shows our project summary and orders received for FY2018. Starting with defense, the SM-3 Block IIA development has been successfully completed after finishing up flight tests. We have received orders for two new destroyers last year. Up to 8 ships, 2 per year, are planned with our company designated as the prime contractor. Last October in Kobe, the christening and launch ceremony of the submarine Oryu was conducted, as was the delivery ceremony for the destroyer Shiranui in Nagasaki. Now for space systems, we have launched three vehicles, two of the H-IIAs and one H-IIB. In terms of launch services, we have reached an agreement with Inmarsat in the UK. Inmarsat is the fifth largest satellite operator in the world. Although the contract has not been signed yet, Inmarsat expressed intention to launch a satellite using the H3 rocket. For H3, we have started the first stage BFT – battleship firing test at the Tashiro Field Laboratory in Akita prefecture. It has been progressing quite positively. As of now, our HTV has launched its number seven vehicle, and we were able to make a reentry in November. And our HTV-X is in the detailed design phase.

4-2. 2018 Business Plan Progress Status

Achievements in FY2018

■ Generally smooth progress toward achievement of 2018 Business Plan targets

- Sales revenue reached target
- EBIT slightly exceeded target on fixed/variable costs reduction



Business Environment

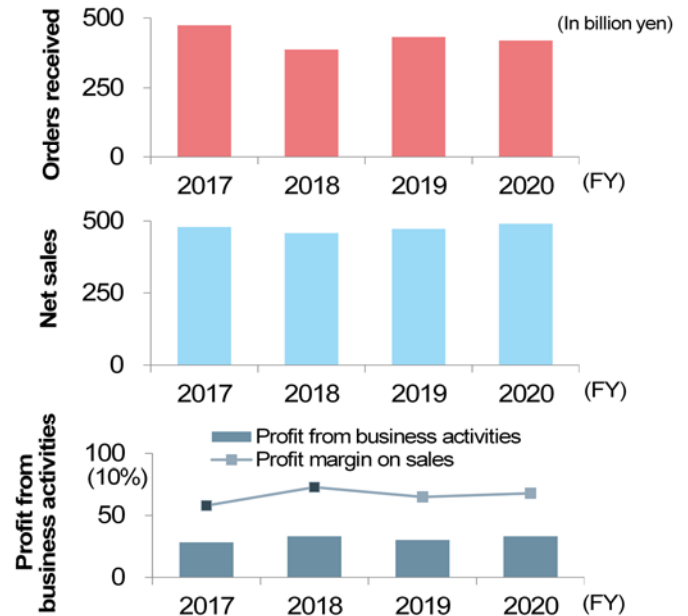
■ Government plans established in FY2018 fell within MHI's range of assumptions made when 2018 Business Plan was formulated.

- Defense: National Defense Program Guidelines for FY2019 and Beyond / Medium Term Defense Program (Dec 18, 2018)
- Space systems: Basic Plan on Space Policy revised (Dec 11, 2018)

Policies for FY2019 and FY2020

■ Firmly hold to basic policies of 2018 Business Plan

- Expand business through acceleration of growth strategies
 - Steadily get next core businesses up and running
 - Prepare for promoting medium and long term business plan
- Continuously strengthen existing businesses
 - Reduce fixed costs rate
 - Reduce variable costs



Next, I'll talk about progress in our mid-term business plan; which started in 2018 and ends in 2020. For 2018, the results can be seen on this slide. The orders, revenues and the profits are shown here. They are pretty much in line with our expectations. Also, in terms of the business environment, as of the end of last year, the new national defense program guidelines and also the medium-term defense programs were established. For space systems, the basic plan on space policy was revised. Based on the market trend, it was pretty much within our expectations. The impact on our business is minimal. Based on that, we have policies in place for this year and next year, FY2019 and 2020. We expect to see a gradual increase in the overall numbers. Also, some of the policies going forward are to expand business through acceleration of growth strategies and continuously strengthening our existing businesses. The second part about strengthening of existing businesses will directly affect profits. So gradually, we will be seeing an improvement in existing businesses.

Long-range Market Outlook

Growth Strategies for Next 3-Year Business Plan

Defense

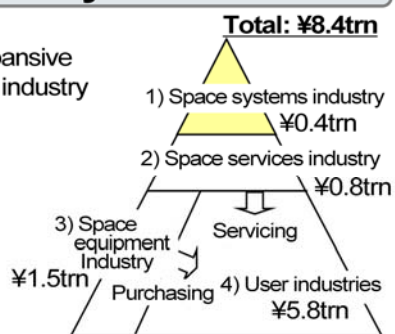
- Defense budget in increasing trend (increased maintenance and servicing costs)
- Formulation of new National Defense Program Guidelines and Medium Term Defense Program
 - ✓ Early start of future fighter development
 - ✓ Projected growth in space, cyber and electromagnetic domains



Source: Compiled by MHI based on online information of Japanese Ministry of Defense and House of Councillors

Space Systems

- Market extremely expansive below space systems industry (MHI core business)



Source: Compiled by MHI based on The Society of Japanese Aerospace Companies' (SJAC) "JAPANESE SPACE INDUSTRY ANNUAL SURVEY REPORT -FY2017 Results-"

- #1: Expansion of existing domestic and peripheral fields (ref: page 26)
 - Existing business
 - Steadily get next core businesses up and running (future fighter, H3 launch vehicle)
 - Expand business scope such as command and control, M&S, etc.
 - Peripheral fields
 - Expand MRO business in maintenance and servicing fields
 - Expand into new peripheral fields (space (including satellite information usage), cybersecurity, unmanned vehicles etc.)
- #2: Overseas business expansion
 - Adapting MHI components for use in overseas equipment
 - Utilize channels with overseas manufacturers cultivated through existing businesses
 - Collaborate with Japanese government in parallel with inter-company consultations
 - Potential international joint development projects
 - Start international joint development projects with alliance countries (MHI support Japanese government)
 - Enter joint development projects
- #3: Establishment of dual-use development businesses (ref: pages 27-28)
 - Utilize core technologies of defense and space business
 - Meet private-sector demand particularly in safety and security field (Cybersecurity, Situational awareness, Wide-area status observation)



This shows our measures targeted towards FY20-21 and beyond. At the top left, we have the long-term market outlook. So, for the defense market, as many of you are aware, in 2013 and onwards the defense budget has been gradually increasing. In accordance with that, what is increasing here, as you may be aware, is FMS through which equipment has been purchased from the US. Also, maintenance and servicing costs have been on the rise as well. This is a major trend within the defense market. Another point about space systems, if you were to analyze the market, or what we call the space systems industry, which is made of rockets and satellites and so forth, you'll find that the whole space market, and the industries that make use of satellite data is quite large. The satellite data usage, data utilization industry is much larger. Based on this outlook, we have formulated the growth strategy on the right-hand side. Since a couple of years back, we have been promoting this strategy. In terms of growth strategy, the first plan of action is to increase our domestic, existing business, our second is for overseas business expansion, and the third is to establish a dual use development businesses. So, let us first start with existing businesses on the domestic front. The details are shown in the next page onwards. First of all, the existing businesses includes the future fighters and H3 launch vehicle. That will become part of our core strategy for the next year onwards. In terms of the peripheral fields, we talked about increasing maintenance and servicing costs. So, our MRO business will be very important. And also satellite information usage would be another important part. Phase two of our growth strategy is overseas business expansion. Exporting of MHI components will be our focus in this area. And also, we would like to look into potential international joint development projects. The third strategy is establishment of dual use development businesses. So, that is for defense and space systems. We would like to leverage our core technologies to focus on security applications. This is an objective we have set forth and are promoting.

Growth Strategies for Next 3-Year Business Plan #1: Expansion of existing domestic and peripheral fields

	Defense	Space Systems
Existing	<h3>Future Fighter</h3> <ul style="list-style-type: none"> ● New Medium Term Defense Program calls for early development led by Japan ● Acquisition completed of all key technologies necessary to start development ● Research on the integration of the mission system of a fighter aircraft incorporated into FY2019 budget <div style="text-align: center;"> <p>Integration of mission system (conceptual image)</p> <p>Source: Ministry of Defense website ("Overview of FY2019 Budget")</p> </div>	<h3>H3 Launch Vehicle</h3> <ul style="list-style-type: none"> ● Under development for the first launch in FY2020 <ul style="list-style-type: none"> ▪ Detailed design phase of launch vehicle systems completed; now in production and testing phase ▪ 1st-stage battleship firing test with propulsion system and engines began in early 2019 <div style="text-align: center;"> <p>Battleship firing test</p> </div> <ul style="list-style-type: none"> ● In preparation of operation system for launch services
	Peripheral	<h3>MRO business</h3> <ul style="list-style-type: none"> ● Entry into government maintenance work as private sector for the needs of low birthrate and aging population <ul style="list-style-type: none"> ▪ Involvement of defense aircraft, etc. underway toward integrating management of armed forces and in-house maintenance data, contributing to maintenance streamlining ● Expand into MRO business for U.S. forces stationed in Japan <ul style="list-style-type: none"> ▪ MRO underway for equipment models common to Japan and U.S. forces, in areas where MHI can use its own facilities

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MRO: Maintenance, Repair and Overhaul

Let us look at the domestic existing business and how we can increase the peripheral fields. First let's take a look at the future fighters. As of the end of last year, the new medium-term defense program was established. This calls for early development led by Japan. And our acquisition has been almost completed of all key technologies necessary to start development. In addition, research on the integration of the mission system of a fighter aircraft has been incorporated into our FY2019 budget. We will proceed diligently with preparations and research. Now in terms of the peripheral area, let's take a look at our MRO business for defense. With declining birth rates, we would like to enter into the government maintenance segment to integrate the management of armed forces and in-house maintenance data contributing to streamlining maintenance. Also, under the Japan-US security cooperation, we will contribute to the maintenance of equipment of US forces stationed in Japan through our own existing facilities. As for the H3 launch vehicle, we are looking into our first launch for FY2020, as mentioned already. With the two engines mounted, we have conducted the BFT already. We are under preparation to conduct the BFT for three engines. We would also like to prepare for the operations system for launch services. And we will be looking into receiving orders for the launch services as well. In terms of the periphery area, we will focus on satellite data utilization. We would like to pursue analyzing satellite images and other data for maritime domain awareness and disaster response. We are already conducting a trial at a customer site.

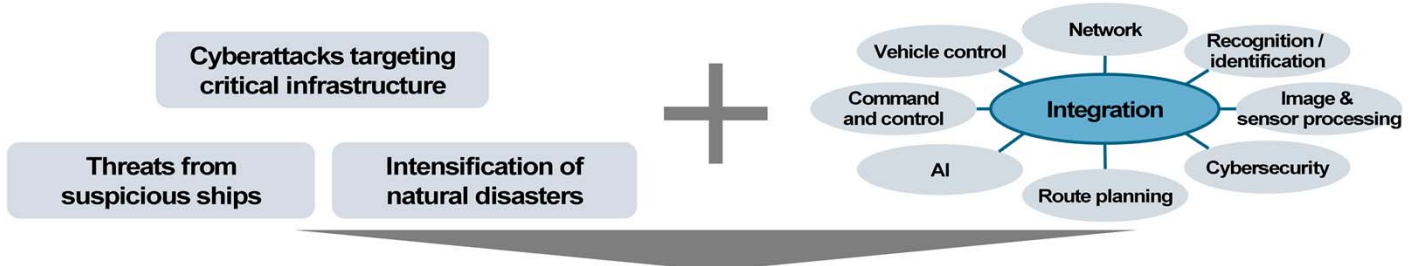
4-3. Measures Targeted at FY2021 and Beyond (3/5)

Growth Strategies for Next 3-Year Business Plan
 #3: Establishment of dual-use development businesses 1/2

- Provide total solutions enabling safety and security
- Meet private sector demand for dual use cutting edge technologies developed in Defense & Space Systems business

Expanding needs for safety and security measures

MHI technologies cultivated in defense and space areas



Total solutions for safety and security

Cybersecurity	Situational awareness	Wide-area status observation
<p>InteRSePT Protection of Control Systems</p>	<p>CoasTitan Monitoring by Unmanned Vehicles</p>	<p>BRAINS Analysis of Wide-Area Image Data</p>
<p>Real-time analysis of operation patterns in infrastructure control systems; early anomaly detection</p>	<p>Developed system matching customer needs, integrating UAVs, USVs and UUVs</p>	<p>Satellite image data analyzed by AI, enabling swift grasp of damage, contributing to disaster relief</p>

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UAV: Unmanned aerial vehicle, UUV: Unmanned underwater vehicle, USV: Unmanned surface vehicle

Next, I would like to focus on the dual use development business. Provision of total solutions enabling safety and security is important. So, we would like to meet the private sector demand for dual use by promoting and implementing our cutting-edge technologies. When we talk about safety and security measures, we are addressing cyber-attacks that target critical infrastructures, threats from suspicious vessels at sea, as and intensification of natural disasters. By combining our state of the art technologies, we are able to develop various solutions to combat and prevent such cyber threats. At the bottom of the slide, you can see our core set of solutions, starting from the left at cyber security and then moving on to situational awareness, and then wide area status observation. InteRSePT, CoasTitan, BRAINS are the brand names for these specific applications and various trials are underway.

4-3. Measures Targeted at FY2021 and Beyond (4/5)

Growth Strategies for Next 3-Year Business Plan

#3: Establishment of dual-use development businesses 2/2

Cybersecurity

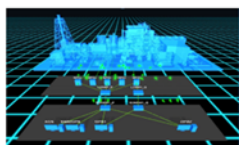


FY2016-FY2017

- In collaboration with NTT, developed malfunction detection device for control equipment

FY2018

- Commercialization and market launch
- Improved functions such as automatic generation of detection rules
- Mounting in defense equipment
- Demonstration testing at waste incineration facility and power generating plant



FY2019 and beyond

- Use of AI, development of advanced defense functions
- Proactively undertake demonstration tests with potential customers, toward expanding applications

Situational awareness

CoasTitan

FY2017

- Started concept study
- Developed unmanned autonomous vehicles and surveillance control system

FY2018

- In-house demonstration testing
 - Network (remote) monitoring
 - Automated ship landing of unmanned aircraft
- Manpower-saving control device



FY2019 and beyond

- Demonstration testing at customer sites
- Improve usability, toward commercialization
- Interface with unmanned underwater/ground vehicles
- Add situation analysis function, toward disaster situation monitoring

Wide-area status observation

BRAINS

FY2017

- Started concept study
- Survey of customer needs

FY2018

- In-house demonstration testing (disaster detection/analysis, vessel differentiation)
 - High-volume visual analysis processing
 - Differentiation/identification using AI
 - Improved operability



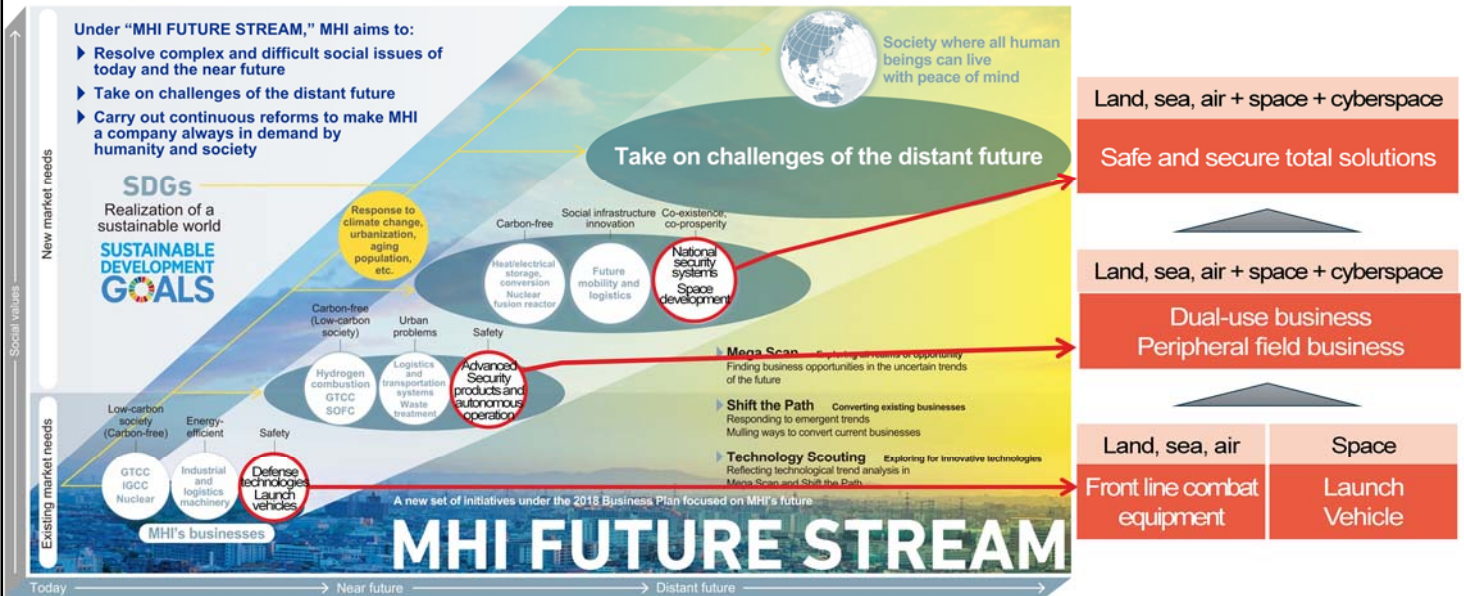
FY2019 and beyond

- Demonstration testing at customer sites

Here's a closer look at the three solutions. Let's start off with InterSePT. In 2016, through collaboration with NTT, we launched this project to detect irregular behavior and movement within facilities and infrastructures. We have been developing various products, but from this year onwards, we will be conducting demonstrations at customer sites, especially for InterSePT. It has already been tested and used at a facility housing defense equipment. For situational awareness, our CoasTitan solution consists of unmanned autonomous vehicles, remote monitoring systems, and a surveillance control system that is now under development for vessels. So, some will go under water and some will fly in the air. From this year onwards, we would like to start demonstrations of the CoasTitan for potential and current customers. Finally, BRAINS is our wide area status observation solution. This is currently undergoing internal testing, and will function to collect and process big data, such as satellite and terrestrial data, in order aid in disaster prevention.

Long-term vision

Expand business territory from land, sea, air and space to cyberspace and provide total solutions enabling safety and security



Within this, we have the company-wide stream, or MHI future stream. Right now, we are at the phase on the bottom right – land, sea, air, the front-line combat equipment and launch vehicle. This is the stage we are in. But we are moving to the next stage, a dual use business and peripheral filed business stage, and will be adding cyber space to our land, sea, and airspace territories. Finally, we would like to incorporate all these areas to provide total solutions for safety and security.

That is all for me. Thank you very much.

MOVE THE WORLD FORWARD

**mitsubishi
heavy
industries
group**