Aerospace Systems
Business Operation

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General Manager
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4. Summary

Mitsubishi Heavy Industries, Ltd. owns all intellectual property rights concerning these materials.
1. FY2010 Overview

Orders
Increase of 272.6 billion yen from previous fiscal year by the increase of MRJ and defense related products. (+108.1 billion yen compared to plans at start of the period)

<table>
<thead>
<tr>
<th>Year</th>
<th>Orders (billion yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>435.5</td>
</tr>
<tr>
<td>2010</td>
<td>708.1</td>
</tr>
</tbody>
</table>

Sales
Decrease of 28.0 billion yen from previous fiscal year (+12.2 billion yen compared to plans at start of the period)

- Aircraft deliveries
  - B777 63 airplanes (-19 planes YOY)
  - B787 17 airplanes (+2 planes YOY)

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (billion yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>500.2</td>
</tr>
<tr>
<td>2010</td>
<td>472.2</td>
</tr>
</tbody>
</table>

Operating income
Deficit reduction by 3 billion yen from previous fiscal year (+6.6 billion yen compared to plans at start of the period)

Despite the impact of the high yen trend on foreign exchange rate, the deficit was reduced from the previous year by improving profitability of commercial aircraft.

<table>
<thead>
<tr>
<th>Year</th>
<th>Operating income (billion yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>-3.4</td>
</tr>
<tr>
<td>2010</td>
<td>-6.4</td>
</tr>
</tbody>
</table>

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2. Changes in the Business Environment and Target of the 2010 Business Plan (1) Overview of the Aircraft Business

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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Technological expertise gained through licensed production of fighter aircraft / helicopters</td>
<td>F-86F</td>
<td>F-104J</td>
<td>F-4EJ</td>
<td>F-15J</td>
<td>Helicopters (S-61, HSS-2, SH/UH-60)</td>
<td>SH-60K</td>
</tr>
<tr>
<td></td>
<td>Improved technological capabilities through development of domestic fighter aircraft</td>
<td>T-2/F-1</td>
<td>T-2CCV development</td>
<td>F-2</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Full scale RCS* test model</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Interruption of the domestic commercial aircraft industry</td>
<td>Repair of fighter aircraft</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>SH-60K</td>
<td>Advanced Technologies for fighter aircraft</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>MRJ</td>
<td>B787</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B777</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td></td>
<td>YS-11</td>
<td>MU-2, MU-300</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Mitsubishi Heavy Industries, Ltd. owns all intellectual property rights concerning these materials.</td>
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</tbody>
</table>
(2) Changes in the Business Environment

Production in the Japanese aircraft industry

In 2007, commercial aircraft production exceeded defense.

In the next 20 years, demand for passenger aircraft will grow 2.5 times in the world. Further expansion of commercial aircraft market by the introduction of Japanese-built passenger airplanes is expected.

Based on the results of a survey by The Society of Japanese Aerospace Companies

The budget for defense is on the decline. Significant demand growth could not be expected in the future.
(3) Target of the 2010 Business Plan

**Market Demand**
- Defense: Flat ~ gradually decreasing
- Commercial: Recovering, Long-term growth
- Space: Operating period for International Space Station extended

**Orders received**
590 billion yen for FY2014

**Net Sales**
650 billion yen for FY2014

**Operating income**
17 billion yen for FY2014 (Increase of 20.4 billion yen from 2010)
- Cost reduction activities to improve near-term profitability
- Upturn of B787 profitability by sales increase and initial investments completion.
3. FY2011 Business Operation Policy
(1) Commercial Aircraft  (i) Demand for Aircraft Passengers

Demand for international aircraft passengers: High growth expected in the long term (more than 2.5 times in 20 years). Demand for commercial aircraft also expanding.

Revenue passenger kilometers (billion passenger km)

<table>
<thead>
<tr>
<th>Country</th>
<th>1989</th>
<th>2009</th>
<th>Actual results</th>
<th>Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>1,957</td>
<td>6,921</td>
<td>2.6 (15%)</td>
<td>4.0</td>
</tr>
<tr>
<td>Europe</td>
<td>1,161</td>
<td>1,241</td>
<td>4.9 (26%)</td>
<td>6.1</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>1,241</td>
<td>1,310</td>
<td>7.0 (28%)</td>
<td>6.0</td>
</tr>
<tr>
<td>Others (Incl. CIS)</td>
<td>1,222</td>
<td>8,765</td>
<td>2.7 (19%)</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Source: Japan Aircraft Development Corporation

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(ii) Market Trend by Airplane Size (Number of Seats)

Demand forecast for new airplanes over 20 years (2010-2029): Approx. 29,000 planes

Total
29,083 planes
USD 2.872 trillion

Source: Japan Aircraft Development Corporation

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(iii) Commercial Aircraft: Business Strategy

**Market**
Demand for aircraft is right on track for recovery by airline companies’ recovering business vitality, and continued growth in emerging nations. Long-term expansion can be expected.

**Business Strategy**
Increase earnings by optimizing the portfolio of complete aircraft (MRJ), Joint development under the international cooperation (787 etc.), and Aeroengines (Trent1000 etc.)

1) Complete aircraft and Joint development
- At present, secure profits with a focus on the 777 and other joint developments under the international cooperation with Boeing.
- Establish dual earnings sources by adding the MRJ in the future
- To counter the strong yen, promote measures to reduce foreign exchange rate fluctuations.
- Implement further cost-reduction.

2) Aeroengines
- Create profit with aeroengines in production (PW4000, V2500 etc.)
- Development and smooth preparation for production for new aeroengines (Trent1000 etc.)

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(iv) MRJ: Product Concept

**Mitsubishi Regional Jet**

**MRJ90** Single class: 86-96 seats

**MRJ70** Single class: 70-80 seats

**Selling points**

**Passengers**
- More Comfortable cabin
  - Cabin design for passengers
  - New style of slim seats

**Environment**
- Lower Fuel Burn, Noise, and Emissions
  - Game-changing engine
  - Advanced aerodynamic design

**Airlines**
- More Efficient Aircraft
  - Game-changing engine
  - Advanced aerodynamic design
  - Composite materials technology

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(iv) MRJ: Business Structure

**Mitsubishi Aircraft Corporation**
- MRJ business
- Design, Type Certification
- Sales, customer support

**MHI**
Fabrication and final assembly of the aircraft

**Partner (Japan and overseas)**
Engines/Equipment

**Customer**
Sales financing support
Sales
Support

**Nippon Export and Investment Insurance (NEXI)**

**Orders**

**Investments**
(iv) MRJ: Schedule

Development is in progress successfully

- 2007.10 Authorization to Offer (ATO)
- 2008.3 Launch (Concluded LOI with ANA for 25 airplanes (including 10 options))
  ⇒ 2010.6 Definitive purchase agreement
- 2008.4 Started business as Mitsubishi Aircraft Corporation
- 2008.10 Established sales office in the United States
- 2009.9 Finalized the MRJ configuration (expansion of cabin space, integration of cargo space, main wing materials change)
- 2009.10 Announcement of the signing of LOI with Trans States Holdings, Inc. for 100 airplanes (including 50 options)
  ⇒ 2010.12 Definitive purchase agreement
- 2010.9 From detailed designing phase to the production phase
- 2011.4 Start assembly work
- 2012 First flight (scheduled)
- 2013 Type Certification (scheduled)
- 2014 First aircraft delivery (scheduled)
(iv) MRJ: Start of Assembly Work

Started assembly work from April this year
Ceremonial rivet driving cerebration was held at Nagoya Aerospace Systems Works on April 5, 2011.
Started the assembly of the frame structure in the cockpit roof of the aircraft for bird strike tests
**(v) Boeing 787: Schedule**

Boeing is delivering the first aircraft to ANA in third quarter of this year (scheduled).

Sales/profit increase by production rate up to 10 shipsets per month.

- **✓ 2009.12** Successful first flight
- **✓ 2011.03** Firm orders for more than 830 airplanes
- **✓ 2011.04** MHI wings for 40 airplanes delivered
- **✓ 2011.3Q** Type Certifications and delivery of first airplane (scheduled)
- **End 2012** 10 shipsets per month delivery (scheduled)
(v) Boeing 787: Productivity Improvement

Improve production efficiency and implement automation to support production rate of 10 shipsets per month

Expand facilities and introduce automated equipment to support production rate increase

Stringer end trimmer (Introduced)

Automatic laminator for stringers (Introduced)

Water-jet cutting machine for skin (Expanded)

Composite material layup equipment (Expanded)

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(vi) Improvement of Commercial Aircraft Production Efficiency

**Improvements by means of PULL production process**

<table>
<thead>
<tr>
<th>PULL production</th>
<th>Plan</th>
<th>Procure materials</th>
<th>Store materials</th>
<th>Manufacture parts</th>
<th>Kit Center</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan / Required amount</td>
<td></td>
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</tbody>
</table>

★ A production system that only replenishes the portion of necessary parts needed for post-processing

→ **Reduce raw materials/in-process inventory**

<table>
<thead>
<tr>
<th>PUSH production (previous)</th>
<th>Plan</th>
<th>Procure materials</th>
<th>Store materials</th>
<th>Manufacture parts</th>
<th>Parts inventory</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan / Required amount</td>
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</tbody>
</table>

★ Unit production based on planned amounts/production schedule

→ **Difficult to respond to fluctuations such as model changes**

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**Improvement by developing “moving line”**

Before improvement

- Fixed style
- Work progress not visible

B737 flap assembly line

After improvement

- **Reduce production costs**
- **Improve quality**

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**Improvement by parts kit**

Supply medium and small parts from Kit Center as necessary for immediate use on the assembly line

Example of B777 parts kit

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(vii) Globalization of Commercial Aircraft Production

Promote overseas production as a measure to reduce fluctuations risk of foreign exchange rate ("dollar conversion of yen based costs")

Challenger 300 assembly work in Canada (MHICA)

B737 flap assembly in Vietnam (MHIIVA)

MHI Aerospace Vietnam Co., LTD.
Thang Long Industrial Park, Hanoi

MHI Aerospace Canada, Inc.
Missisagua on the outskirts of Toronto
(viii) Improvement of Commercial Aircraft Profitability

Profitability structure of commercial aircraft / Aeroengines
Because significant investment is necessary in development stage, initial burden of depreciation costs is high. Thereafter, profit/loss will be improved through production learning effect, efforts to keep costs reduction activities at the production stage, and full depreciation of initial investment.

Examples of cost reduction activities

(1) Materials cost
   Buying in quantity, overseas procurement, blanket order
(2) Manufacturing cost
   Improve production process (e.g. moving line, supply parts kits)
   Invest for efficiency
   (e.g. Introduce automated equipment, tools improvement)
   Design improvements etc.
(3) Other
   Logistics streamlining

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3. FY2011 Business Operation Policy
(2) Defense (i) Budget Trends

- Amid a trend for cutbacks in budget for defense equipment, budget for aircraft have been decreasing in recent years while budget for the missiles have been increasing.

→ Sustain business scale with BMD and other missiles
(ii) Business Strategy

**Market**
New projects in the National Defense Program Guideline for FY2011 and beyond, and Mid-Term Defense Program (FY2011-FY2015) are initiated.

(i) The National Defense Program Guideline, Mid-Term Defense Program were approved by the cabinet in December last year.
- Aim to raise the readiness of the Self-Defense Force and to strengthen joint operations, on the other hand Cold War-style equipment/organization to be reduced.
- Clarify medium and long-term strategy in order to develop and maintain defense production and technological base.
- Study for changes in the international environment regarding defense equipment (international joint development is the mainstream among developed countries)

(ii) In January this year, the Ministry of Defense organized the IPT (Integrated Project Team) and started evaluation work to select a successor to the F-4 fighter aircraft (F-X).

**Business Strategy**
sustain and develop by responding to nation’s needs

(i) Sustain fighter aircraft production and technological bases.
   From platform manufacturer to weapon systems integrator for fighter aircraft.

(ii) Improved SM-3 interceptor missile under joint development by US and Japan
   ; Secure work share for Japan by joint production by US and Japan

(iii) Respond to decrease in budget by securing base load through acquiring orders for repairs and spare parts

(iv) Steady promotion of new programs (Advanced Technology Demonstrator, New air-to-ship missile, Type 88 surface-to-ship missile (improved), Next rescue helicopter for Air Self Defense Force)
3. FY2011 Business Operation Policy  
(3) Space  (i) Market Trends

- Government demand: At present, large-scale increase in national space-related budget cannot be expected
- Operating period for International Space Station (ISS) extended (2015→2020)
(1) Promote use of satellite data from Earth Observing Satellites
(2) Quasi-Zenith Satellite: First satellite (for verification), study business plans including 2nd satellite and thereafter
(3) Improve manned technology platform
(4) Overseas expansion by means of space system package proposals
   (Set up government taskforce team aiming to export to emerging countries etc.)

Official demand: Satellite launches

<table>
<thead>
<tr>
<th>Rocket</th>
<th>Customer</th>
<th>Satellites</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-IIB</td>
<td>JAXA</td>
<td>Global Change Observation Mission – Water</td>
<td>FY2011</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(GCOM-W)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advanced Land Observing Satellite (ALOS-2)</td>
<td>FY2013</td>
</tr>
<tr>
<td>H-IIA</td>
<td>JAXA</td>
<td>Global Precipitation Monitoring System (GPM)</td>
<td>FY2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>X-ray Astronomy Satellite (ASTRO-H)</td>
<td>FY2013</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quasi-Zenith Satellite</td>
<td>From FY2013</td>
</tr>
<tr>
<td>H-IIB</td>
<td>JAXA</td>
<td>HTV Kounotori</td>
<td>FY2011,</td>
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<tr>
<td></td>
<td></td>
<td>Cargo transporter to the Space Station</td>
<td>FY2012,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FY2013</td>
</tr>
</tbody>
</table>

Forecast of demand for commercial satellites

Extracted from Commercial Space Transportation and the Commercial Space Transportation Advisory Committee, a report by the Federal Aviation Administration (FAA) in the United States

- Launch possible with H-IIA
- Launch up to 8t possible with H-IIB

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(ii) Business Strategy

Business Strategy:

- Improve reliability and secure base load with continuous successes of launch.

- Aiming to strengthen international competitiveness for launch services, start development of H-IIA upgrade/next-generation primary launch system

- Promote HTV-R (HTV improved model with recovery functions). Develop for future human space activities.

Cargo transporter to the Space Station,
HTV KOUNOTORI

January 22, 2011
Successful launch of H-IIB
Launch Vehicle No.2 with the KOUNOTORI
14th successful launch with H-IIA/H-IIB
4. Summary

- Commercial:
  Expand business, grow into mainstay businesses

- Defense:
  Sustain and develop as mainstay business

- Space:
  Develop cutting-edge technology in response to demands by the country as a scientific and technological nation

Future

Present

Proportion of business (%)

Commercial
30%

Defense
60%

Space
10%

Secure profits through international co-development

System integration Upgrade program

Secure reliability through continuous successes of launch

Secure reliability through continuous successes of launch

Countermeasures for foreign exchange rate fluctuation

Promote cost reduction activities

Promote HTV-R

Steadily sustain/develop as mainstay business

Promote cutting-edge technologies development

Promote international cooperation of development as a leading company of Tier 1 partner.

Secure position as manufacturer of complete airplanes through overall integration of MRJ.

Proportion of business (%)

60%

30%

10%
Forecasts regarding future performance in these materials are based on judgment made in accordance with information available at the time this presentation was prepared. As such, those projections involve risks and insecurity. For this reason, investors are recommended not to depend solely on these projections for making investment decision. It is possible that actual results may change significantly from these projections for a number of factors. Such factors include, but are not limited to, economic trends affecting the Company’s operating environment, currency movement of the yen value to the U.S. dollar and other foreign currencies, and trends of stock markets in Japan.