Commercial Aviation & Transportation Systems Business Plan

Member of the Board, Senior Executive Vice President, President and CEO,
Commercial Aviation & Transportation Systems

Yoichi KUJIRAI

June 10, 2016

MITSUBISHI HEAVY INDUSTRIES, LTD.
1. Business Overview
   1-1. Domain Statement
   1-2. Business Overview

2. Progress Status of 2015 Medium-Term Business Plan
   2-1. Main topics in FY2015
   2-2. 2015 Medium-Term Business Plan Progress Status and Earnings Outlook

3. Business Strategies
   3-1. Commercial Aircraft
   3-2. MRJ
   3-3. Transportation Systems
   3-4. Commercial Ships

4. Summary
Table of Contents

1. Business Overview
   1-1. Domain Statement
   1-2. Business Overview

2. Progress Status of 2015 Medium-Term Business Plan
   2-1. Main topics in FY2015
   2-2. 2015 Medium-Term Business Plan Progress Status and Earnings Outlook

3. Business Strategies
   3-1. Commercial Aircraft
   3-2. MRJ
   3-3. Transportation Systems
   3-4. Commercial Ships

4. Summary
1-1. Domain Statement

We launched new group statement and tagline to increase recognition and understanding of MHI Group in global markets on May 9, 2016. It shows as commitment to customers, society and regions (the role of MHI), MHI Group strengths (and the value we deliver), Proactive contribution for global growth, Clarifies competitive advantage and differentiation.

Group Statement

At Mitsubishi Heavy Industries Group, we channel big thinking into solutions that move the world forward – advancing the lives of everyone who shares our planet.

By bringing people and ideas together as one, we continue to pave the way to a future of shared success.

Passionately finding new, simpler and sustainable ways to power our cities, improve infrastructure, innovate manufacturing and connect people and businesses around the globe with ever-increasing speed and efficiency.

This is the power of true harmony.
This is what moving the world forward is all about.
This is today’s Mitsubishi Heavy Industries Group.

Tagline

MOVE THE WORLD FORWARD
1-1. Domain Statement

Philosophy of Domain Statement

Built from elements of Group Statement announced on May 9, 2016 relevant to Commercial Aviation & Transportation Systems domain, as part of MHI Group Brand Story

Concept behind Commercial Aviation & Transportation Systems domain Statement

The Commercial Aviation & Transportation Systems domain helps build infrastructure that transports people and goods necessary to lives everywhere.

Through integration and harmony, the domain builds bridges on land, at sea and in the air connecting people in ways not possible before, creating a global community beneficial to everyone.
1-1. Domain Statement

**MOVE THE WORLD FORWARD**

We are evolving the power of mobility. Redefining how our social infrastructure runs by moving people and freight forward with ever-increasing safety, efficiency and reliability.

Whether it’s in the air, on the ground, or across oceans that once divided us, we’re connecting people and business like never before. After all, progress requires forward thinking. The kind that helped us create the world’s most environmentally-friendly aircraft and transportation systems. Along with ships that link opportunity and success in the most economical and efficient ways imaginable. By embracing integration and harmony, we’re creating a more cohesive global community that benefits everyone it touches.
1-2. Business Overview

Commercial Ships
- LNG/LPG carriers
- Ferries
- Cruise ships

Commercial Aircraft
- 787 main wings
- 777 fuselage
- 767 fuselage
- MRJ

Transportation Systems
- Rail transit system
- AGT
- MRJ: Mitsubishi Regional Jet, AGT: Automated Guideway Transit (for city)

FY2015 Net Sales
550.0

(In billion yen)
1. Business Overview
   1-1. Domain Statement
   1-2. Business Overview

2. Progress Status of 2015 Medium-Term Business Plan
   2-1. Main topics in FY2015
   2-2. 2015 Medium-Term Business Plan Progress Status and Earnings Outlook

3. Business Strategies
   3-1. Commercial Aircraft
   3-2. MRJ
   3-3. Transportation Systems
   3-4. Commercial Ships

4. Summary
2-1. Main topics in FY2015

**Commercial Aircraft**
- Robust orders for commercial aircraft 787, 777, 737, etc.
- Boeing 787 production expansion facility goes onstream
- Shimonoseki Composite Wing Box Fabrication Factory
- November 2015: Successful first flight of MRJ

**Transportation Systems**
- October 2015: First delivery of new AGT for Saitama New Urban Transit Co.'s “New Shuttle”
- March 2016: Order received to expand APM system capacity at Singapore Changi Airport
- March 2016: Contract awarded for Red Line Construction Project in Bangkok, Thailand

**Commercial Ships**
- April 2015: Delivery of No.2 large ferry to Hankyu Ferry Co.
- September 2015: Orders received for “SAYARINGO STaGE” next-generation LNG carriers
- November 2015: Mitsubishi Heavy Industries Shipbuilding Co. receives first order for very large LPG carrier
- Ship of the year 2015 in Japan awarded
<table>
<thead>
<tr>
<th>Basic Policies of 2015 Medium-Term Business Plan</th>
<th>Main business strategies of FY2016</th>
<th>Targeted Business Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve profitability of commercial aircraft products business</td>
<td>Reduce operating capital; continue development of production bases</td>
<td>Advanced aircraft production system</td>
</tr>
<tr>
<td>Carry forward MRJ aircraft and business development</td>
<td>Accelerate new development plan through 3-base structure</td>
<td>Achievement of airframer business</td>
</tr>
<tr>
<td>Secure orders for large-scale urban transportation systems</td>
<td>Consolidate engineering structure; expand O&amp;M business</td>
<td>Comprehensive engineering business</td>
</tr>
<tr>
<td>Cruise ship measures</td>
<td>Promote structural reforms of commercial ship business &amp; restructure cruise ship business</td>
<td>Advanced shipbuilding engineering business</td>
</tr>
<tr>
<td>Create new businesses from domain synergies</td>
<td>Bring forward commercial ship reforms; take development to next step</td>
<td>New infrastructure export model</td>
</tr>
</tbody>
</table>

- **Main business strategies of FY2016**
  - Reduce operating capital; continue development of production bases
  - Accelerate new development plan through 3-base structure
  - Consolidate engineering structure; expand O&M business
  - Bring forward commercial ship reforms; take development to next step
  - Accelerate materializing new businesses

- **Targeted Business Image**
  - Advanced aircraft production system
  - Achievement of airframer business
  - Comprehensive engineering business
  - Advanced shipbuilding engineering business
  - New infrastructure export model
2-2. 2015 Medium-Term Business Plan Progress Status and Earnings Outlook

Orders received
Expand business scale to 900 billion yen

Net sales
Projected to reach 700 billion yen in final year of 2015 Business Plan

Operating income
Amid intense orders/price competition between Boeing and Airbus, growing pressure to cut costs

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Table of Contents

1. Business Overview
   1-1. Domain Statement
   1-2. Business Overview

2. Progress Status of 2015 Medium-Term Business Plan
   2-1. Main topics in FY2015
   2-2. 2015 Medium-Term Business Plan Progress Status and Earnings Outlook

3. Business Strategies
   3-1. Commercial Aircraft
   3-2. MRJ
   3-3. Transportation Systems
   3-4. Commercial Ships

4. Summary
Twin aisle aircraft
For the time being, the 777X and A350 are moving from the development phase to the manufacturing phase; development of new generation models is expected to begin in the 2020s.

Single-aisle aircraft
The 737 and A320 are competing fiercely, driving volume production up and costs down. The 757X and 737X are considered the 737’s next generation.

MHI’s Position
Strategic partner with Boeing, Pratt & Whitney and Rolls-Royce

Market Environment
Overall
- Market expected to double in next 20 years, to 40,000 airplanes or US$5 trillion.
- Amid intense orders/price competition between Boeing and Airbus, growing pressure to cut costs

Twin aisle aircraft
- For the time being, the 777X and A350 are moving from the development phase to the manufacturing phase; development of new generation models is expected to begin in the 2020s.

Business Strategies
Basic Policy
- Improve profitability of commercial aircraft business through production innovations and SCM reforms

FY2015 results
- Restructured production bases and improved production processes
- Completed consolidation in Hiroshima of 767/777 production bases
- Expanded 787 main wing production facilities (from 10 shipsets/month to 12)

FY2016 initiatives
- Reform commercial aircraft Tier-1 production system; automate production plant
- Full scale launch of Matsusaka industrial cluster
- Expand production of commercial aero engines

SCM: Supply Chain Management
3-1. Commercial Aircraft
Production base restructuring and capacity expansion

Facility reinforcement is making steady progress

<table>
<thead>
<tr>
<th>Production models, etc.</th>
<th>Factory</th>
<th>FY2015</th>
<th>FY2016</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oye-nishi</td>
<td>▼Expansion of 787 main wing assembly plant’s paint shop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Composite materials</td>
<td>Shimono-seki</td>
<td>▼September 2015: Completed building expansion</td>
<td>▼February 2016: Launched operations at expanded plant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hiroshima</td>
<td>▼Completed consolidation of 767 production</td>
<td>▼Completed consolidation of 777 production</td>
<td>Completion of Boeing 777X factory refitting</td>
</tr>
<tr>
<td>Boeing Panel</td>
<td>Kobe</td>
<td></td>
<td>Introduction of skin formation equipment</td>
<td>△Launch of 777X</td>
</tr>
<tr>
<td></td>
<td>MHI Vietnam</td>
<td>Started door production</td>
<td>Expansion of door production</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MHI Canada</td>
<td>Expansion of local production</td>
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</tbody>
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3-1. Commercial Aircraft
Reform commercial aircraft production system

Respond to future intensification of commercial aircraft competition, and undertake production system reforms (production elasticity, shorter lead time, reduction of production loss)

Steps in Production Evolution

<table>
<thead>
<tr>
<th>Production process reforms</th>
<th>FY2015</th>
<th>FY2016</th>
<th>FY2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundamental reduction of component production lead time through parts-related supply chain reforms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production reforms carried out at Hiroshima Plant</td>
<td>Launch and development of Matsusaka industrial cluster</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production process synchronization through improvements to business processes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction of core systems</td>
<td>Configuration and full-scale adoption of production platforms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realization of automated assembly plants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirmed feasibility of assembly by robot</td>
<td>Installation of factory equipment</td>
<td>Adaptation to 777X</td>
<td></td>
</tr>
<tr>
<td>Manpower saving in inspection work through AI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirmation of feasibility (surface/nondestructive)</td>
<td>AI installation and equipment verification</td>
<td>Adaptation to 777X</td>
<td></td>
</tr>
<tr>
<td>Processing big data of production/quality information management/analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirmation of feasibility</td>
<td>Data collection</td>
<td></td>
<td></td>
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<tr>
<td>Networking of shared platforms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platform</td>
<td>Networking</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Aircraft production SCM format

Production information platforms
ERP*, MES*, BOM*, big data processing tools, procurement system, configuration management, etc.

Shared production platforms
Scheduler, production monitoring tool (HBC*), AI installation, resource management tool, etc.

## 3-1. Commercial Aircraft
Production system reform; production plant automation

<table>
<thead>
<tr>
<th></th>
<th>FY2016</th>
<th>FY2017</th>
<th>FY2018-FY2020</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment</td>
<td>Installation and</td>
<td>Launch of first</td>
<td>Quantity production</td>
<td>Delivery of</td>
</tr>
<tr>
<td></td>
<td>development</td>
<td>aircraft assembly</td>
<td></td>
<td>first aircraft</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>in 2020</td>
</tr>
</tbody>
</table>

### Equipment Installation

- Main assembly plant
- After completion in June, core equipment to be installed

### Development case of automated equipment

- Moving jig for large-size panels
- Stringer robot

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Refitting of former bridge factory
3-1. Commercial Aircraft
Production system reform; start-up of Matsusaka industrial cluster

Cluster concept
Radically improve lead time and logistics by eliminating outsourcing that spans multiple processes

Matsusaka parts cluster
- Shared equipment area
  - Heat treatment
  - Shot peening
  - Surface treatment, painting
  - Inspections

A Company
- Sheet-metal working
B Company
- Machining
C Company
- Machining

Road map

<table>
<thead>
<tr>
<th>FY2014</th>
<th>FY2015</th>
<th>FY2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept formation and preparation</td>
<td>Establish cluster</td>
<td>Equipment installation</td>
</tr>
<tr>
<td>▼ MHI and Shinwa Industry establish joint venture (Surface treatment and painting)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Matsusaka No.1 Plant

Lead time
30~40 days
90% time reduction
3~5 days

Before FY2015
Matsusaka Cluster
3-1. Commercial Aircraft
Accelerating preparation of long-term growth foundation for commercial aero engines

Secure long-term growth
Strengthen production foundation toward full-scale production expansion and stronger cost competitiveness

Starting engine final assembly and expanding MRO activity

- Accelerating start up of full assembly and performance test of MRJ engines.
- Expansion of repair business, adding V2500 engines repair.

Continuous introduction of cutting-edge technologies into production

- Applying world’s fastest laser cutters to production of combustors (90% reduction in drilling time)

Working together with industrial cluster

- Low-pressure turbine blades: mass production already started
- Combustors and cases: accelerating cluster formation

Commercial aero engine business scale
Expansion to 100 billion yen scale in medium/long term

Production and sales to increase in earliest from 2016

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3-1. Commercial Aircraft  
Supply chain innovations for commercial aero engine business

Production innovations throughout supply chain

**Establish integrated SCM methods utilizing IoT technologies**

- Expand supply chain along with strengthening of production collaboration
- Urgent need to achieve advanced SCM methods (quality, delivery, cost)
- Improve productivity of production control/technologies
- Build global collaborative framework utilizing IoT technologies

**Road Map**

<table>
<thead>
<tr>
<th>FY2016</th>
<th>FY2017</th>
<th>FY2018~</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEP1</strong></td>
<td><strong>STEP2</strong></td>
<td><strong>STEP3</strong></td>
</tr>
<tr>
<td>Visualization and Rationalization</td>
<td>Capability enhancement</td>
<td>Speed improvement</td>
</tr>
</tbody>
</table>

- **Global SCM**
  - Build global SCM database
  - Build global SCM platform
- **Advanced data analysis**
  - Process Control modeling
  - Advanced Intelligence
- **Build BOP platform**
  - Digitize business process
  - Continuous improvement using business indicators
- **Real-time visualization**
  - Process simulation

**IoT:** Internet of Things, **QMS:** Quality Management System, **BOP:** Business Operations Platform, **M2M:** Machine to Machine, **P2P:** People to People, **P2M:** People to Machine
3-2. MRJ (Mitsubishi Regional Jet)

**Market Environment**

**Market scale**
- Over next 20 years, the market for 70-90 seat jets is projected to be around 3,500 units.

**Competitive status**
- Embraer plans to introduce its next-generation 90-seat class E175-E2 in 2020.
- Bombardier is focusing on the 100+ seat C-series; presence in the under-90 seat market is to weaken.

**Future outlook**
- 90-seat class: Competition between MRJ90 and E175-E2
- 70-seat class: MRJ will be the only next-generation aircraft

**MHI's Position**
- MRJ's robust durability and aircraft performance will foster high aircraft value appraisal, giving MHI a solid position in the regional jet market.

**Business Strategies**

**Basic Policy**
- Aircraft and business development to achieve aircraft performance and outstanding customer support above those of Embraer.
- Development costs, which will peak in FY2018, have been fully factored into the 2015 Business Plan.
  ⇒ Efforts will focus on a selling price to recover these costs, and cost improvements.

**FY2015 results**
- First flight carried out on November 11, 2015. More than 30 test flights already completed.
- Letter of Intent (LOI) signed with Aerolease Aviation, LLC on maximum 20 MRJ aircraft.
  (first order from aircraft leasing company)

**FY2016 initiatives**
- Develop 3-base development structure in Japan and U.S.
- Prepare mass production structure

Hiromichi Morimoto, President
Mitsubishi Aircraft Corporation

Jep Thornton, Partner
Aerolease Aviation, LLC
3-2. MRJ
Development progress

### Plans for launching and developing 3 bases in Japan and U.S.

- 3 bases, under the oversight of 3 Vice Presidents, will be linked but operated autonomously.
- Basic performance has been confirmed during 22 flight tests of the first test aircraft. Following modifications, testing resumed May 13. The first flight of the second aircraft was carried out on May 31.

<table>
<thead>
<tr>
<th>Milestone</th>
<th>CY2015</th>
<th>CY2016</th>
<th>CY2017</th>
<th>CY2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>▼First flight</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>▼Resumption of flight tests</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Confirmation of basic performance</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Flight envelope expansion</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Flight tests in U.S.</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Confirmation of requirements for TC flight testing</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>TC flight tests</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Final review</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Delivery to ANA</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

#### Komaki

- Sr. Exec. VP
- Nobuo KISHI
- Domestic tests and results reporting
- Coordination with JCAB
- Mass-production design

#### Seattle Engineering Center

- Sr. Exec. VP
- Shifumi TATSUMI
- Technological issues/design
- Type certification document
- Flight test support
- Product improvement

#### Moses Lake Flight Test Center

- Sr. Exec. VP
- Akihiko ISIKAWA
- Dry run
- Flight test(USA)
- TC flight tests

TC: Type Certificate, JCAB: Japan Civil Aviation Bureau
### 3-2. MRJ Development progress

**Test status**

1st Aircraft (Flight tests in progress)

2nd Aircraft (First flight on May 31)

**Conducted test items**
simulation of single engine in-flight shutdown, simulation of power supply in-flight shutdown, tower flyby at Noto Airport, ram air turbine operation, in-flight engine restart, in-flight APU restart, stall characteristics, etc.

**Seattle engineering center**

Engineering center

Cooperation with experts

**Moses lake flight test center**

Dry run Start

Kick-off speech for dry run by Sr. Exec. VP, Mr. ISHIKAWA

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In line with the development schedule, preparations for mass-production are underway.

- **Verification and improvement of mass-production processes**
  - Solutions to problems that surfaced in manufacturing the test aircraft will be applied to the actual model.

- **Efficient airframe production**
  - Launch of mass production

- **Production rate increase**
  - To recoup losses from schedule delays, a faster production system will be put in place.

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**Komaki-minami New Plant (final assembly plant) (completed March 1)**

**Komaki-minami New Plant panoramic view**

**Paint shop and heavy maintenance Typo hanger rendering**
(Under construction next to the final assembly plant)
3-3. Transportation Systems

Market Environment

Market scale
Annual growth: 2-3%. Current scale: 22 trillion yen/year. Infrastructure demand is firm in the emerging economies.

Market trends by area
- North America
  APM projects and high-speed railway plans on underway.
- South America
  Demand to relieve traffic congestion remains high. PPP projects are expected future expansion.
- Middle East
  Some plans have been deferred due to oil prices down. Urban transportation systems market grows steadily.
- South-Eastern Asia
  Projects proceed in Malaysia, Taiwan etc. with their own financing capability. High-speed railway plans are also moving forward.

MHI's Position
To accessible markets areas of urban transportation business
With MHI total solutions
Based on our strengths in system integration & AGT systems.

Business Strategies

Basic Policy
Targets for large-scale urban transportation systems

FY2015 results
- Design work for the Doha Metro (order received in March 2015) is progressing smoothly.
- Order received (in March 2016) for Bangkok’s Red Line, marking the first such order from Thailand.
- Engineering Headquarters was established (in April 2016) to secure human resources and strengthen EPC execution structure.

FY2016 initiatives
- Receive orders for large-scale transportation projects in the Middle East, Southeast Asia, etc.
- Promote O&M business and Utilization of MIHARA Test Center

Order received (in March 2016) for Bangkok’s Red Line

- Work scope: Design, construction and installation of railway E&M (Electric and Mechanical) system (except for civil and building works)
- Railway line length: North line 26.4km, West line 14.6km
- Delivery: CY2020 (scheduled)

Blue lettering indicates orders received.

1. Doha Metro
2. Jeddah Metro
3. Cairo Metro line No.4
4. Dubai Metro Extension
5. Abu Dhabi Metro

Middle East

North America

ASEAN

South America

Longer-term high-speed railway projects

1. Malaysia/Singapore high-speed railway
2. Texas high-speed railway
3. India high-speed railway

Business developments involving large-scale urban transport projects

1. Bangkok Red line
2. KVMRT Line2
3. Taiwan Taoyuan MRT Green line

Strengthening of EPC execution capability

- Engineering Headquarters consolidated the EPC execution functions of the each domains (transportation systems, chemical plants, etc.)
- Enhance overall EPC execution capability, sharing the experience, expertise and human resources currently spread throughout the Company

EPC: Engineering Procurement Construction, O&M: Operation & Maintenance
MRT: Mass Rapid Transit

Commercial Aviation & Transportation Systems domain
- Business & Marketing Division
- Land Transportation Systems & Components Division
  - Operations management, business strategies, manufacturing, O&M

Engineering Headquarters (April 2016 Established)
- Section related Transportation
  - Project execution/management, resources/expertise sharing

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### O&M business initiatives

- Acquire O&M work within existing received & planned EPC projects
- Organize formation of O&M business execution
  - Business operators with efficient, safe operation know-how
  - Operators with global experience
  - Local partners in the regional line
- Human resources from overseas group O&M companies moved to the MIHARA Test Center (MTC) and trained there
  MTC developed as base of HR training center

### High-speed AGT development
Promotion AGT system business

- High-speed AGT test line dedicated tracks in operation;
  Speed up development of high-speed AGT (80⇒120km/h)
- Lead the AGT market through an expanded AGT lineup
  (last year operations started on the Saitama New Urban Transit and Nippori Toneri Liner lines in Japan)
3-4. Commercial ships

**Market Environment**

Supply/demand gap expected to remain wide, over-supplied tonnage stays longer

- **Cruise ship**
  Steadily growing. Orders are brisk, with European shipyards operating at full capacity until 2020.

- **Gas carriers**
  After shale gas development projects in North America, projects in east Africa and Canadian west coast to emerge, along with replacement demand for existing LNG carriers.

- **Domestic**
  Existing demand for domestic ferry replacements; emerging demand for training ships, research vessels, etc., especially from public sector

**MHI's Position**

- Relatively immune to overall market trends; focus to be on gas carriers, special-purpose domestic ships and cruise ships -- products capable of technical differentiation

**Business Strategies**

**Basic Policy**

Promotion of structural reforms of commercial ships business; restructuring of cruise ship business.

**FY2015 results**

- Commercial ship business affiliated companies established in Nagasaki
- Delivery of 1st ship to AIDA Cruises (March 2016)
- Orders received for LNG/LPG carriers will cover operations through FY2018.
  (Current projects: 11 LNG ships, 9 LPG ships)

**FY2016 initiatives**

- Accelerate structural reforms in commercial ship business
- Complete 2nd ship for AIDA Cruises and evaluate feasibility of cruise ship construction business (by cruise ship business evaluation committee)
- Ropax market initiatives

Ropax: Roll-on/Roll-off Passenger Ship/Ferry
3-4. Commercial ships
Commercial ship business structural reforms

Accelerating reforms under a new organization with two affiliated companies established in October 2015: Mitsubishi Heavy Industries Shipbuilding Co., Ltd. and Mitsubishi Heavy Industries Hull Production Co., Ltd.

Mitsubishi Heavy Industries Shipbuilding Co.

Production
- Consolidation and enlargement of area dedicated to on-site subcontracted work
- Shorter lead time: Shorter processing of outfitting and spherical tanks, etc.
  (24 months from construction start to delivery ⇒ target: 17 months)

Design & procurement
- Efficiency enhancements through common use of drawings for similar type ships (target: 80%)
- Cluster formation, standardization, etc. for imported outfitting equipment and piping unit

Management
- Introduction of area/function based WBS management through reform of cost management
- Visualization and sharing of production information: More efficient setup through preparation of standard BOM

Mitsubishi Heavy Industries Hull Production Co.

- Carry out capital investment with focus on production streamlining
- Promotion of external marketing of hull blocks: expecting order from Imabari Shipbuilding for large container ship blocks, etc.

WBS : Work Breakdown Structure, BOM : Bill Of Materials
Improvement measures taken based on experience with 1st ship

Main improvement measures

➢ Clarify responsibilities and authority of each area manager; remove top-down management culture
➢ Schedule design based on manageable scale of personnel to work onboard ship
➢ Take measures together with the customer concerning work risk arising from quality non-conformities or quality specifications
Restructuring of commercial ship business scope and operations

Focus on Ropax scope, availing of design and construction capabilities cultivated through construction of cruise ships and domestic ferries.

Cruise ships

- Outfitting technology
- Hull structure technology

- Expansion to Ropax business

Co-work between Shimonoseki and Nagasaki

Cargo-passenger ships

- Cruise ship technology/knowledge; application of AIDA experience

Large-scale energy carrier ships

- LNG carrier, LPG carrier, GTCC barge

Ships for governmental agencies

- Patrol vessels, Research vessels

Cargo-passenger ship market

Ropax

Roll-on/Roll-off Passenger Ship/Ferry

Cruise ships

- Technological superiority

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3-4. Commercial ships
Ropax market initiatives

- Demand to replace aging ships exists in all regions.
- Modal shift in cargo-passenger ships projected in Japanese and Asia/Oceania markets.

**European market**
- Passenger > Cargo

**Japanese and Asia/Oceania markets**
- Passenger < Cargo

- Aging vessels (over 20 years)

**804 vessels**

- **Europe**: 404
- **Japan**: 83
- **Asia, Oceania**: 133
- **North & South America**: 120
- **Others**: 64

**Ropax breakdown by vessel age and areas**

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1. Business Overview
   1-1. Domain Statement
   1-2. Business Overview

2. Progress Status of 2015 Medium-Term Business Plan
   2-1. Main topics in FY2015
   2-2. 2015 Medium-Term Business Plan Progress Status and Earnings Outlook

3. Business Strategies
   3-1. Commercial Aircraft
   3-2. MRJ
   3-3. Transportation Systems
   3-4. Commercial Ships

4. Summary
4-1. 2015 Medium-Term Business Plan: Summary and Outlook

**Focus on building foundations for growth**

New business models for airframer, transportation systems, commercial ships, etc.

**Toward growth track**

- Business scale exceeding 1 trillion yen
- Operating income exceeding 100 billion yen

**Making steady progress**

- Passenger and cargo ships new business model
- Transportation Systems lifecycle management
- New Infrastructure export model
- Full-scale growth in commercial aero engines
- Beginning full-scale volume production of MRJ
- Full-scale volume production of 777X
- Delivery of MRJ’s 1st unit
- Delivery of 1st ship to AIDA Cruises
- AIDA#2
- Large-scale urban transportation systems order received
- Structural reforms of commercial ship business
- Flight tests
- First flight of MRJ
- Reorganization of commercial aircraft production bases
- Full-scale volume production of 777X
- High-speed AGT order received

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AGT: Automated Guideway Transit

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