



# Integrated Defense & Space Systems Business Plan

Executive Vice President, President and CEO,  
Integrated Defense & Space Systems

Hisakazu MIZUTANI

6.8.2015

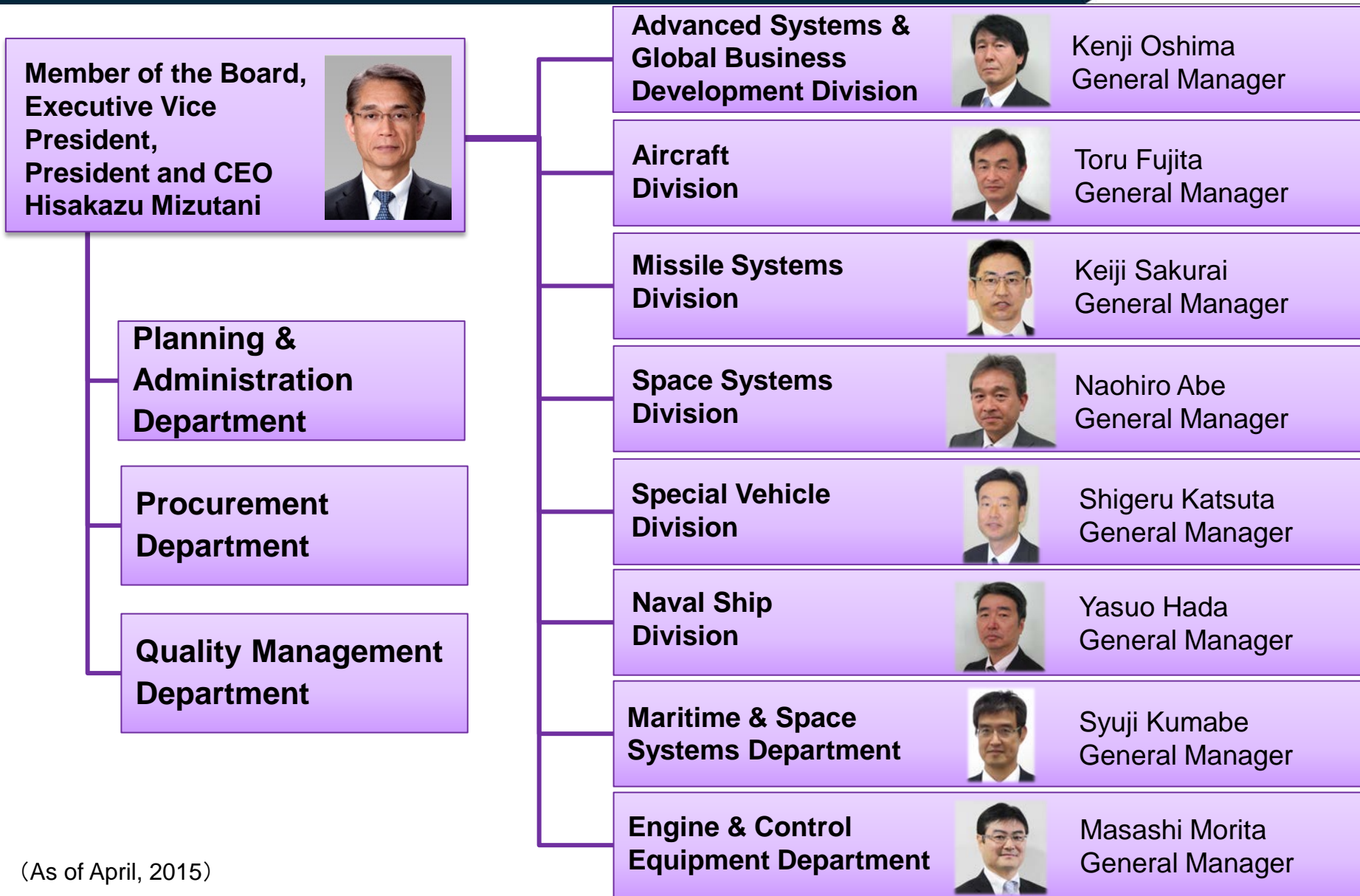
**MITSUBISHI HEAVY INDUSTRIES, LTD.**

- 1. Business Overview**
- 2. Review of 2012 Medium-Term Business Plan**
- 3. 2015 Medium-Term Business Plan**
- 4. Business Strategies**
- 5. Summary**

# 1. Business Overview

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# 1-1. Organization



(As of April, 2015)

# 1-2. Production sites

## Nagasaki Shipyard & Machinery Works

### Main plant

- Escort ship, Torpedo, Shipboard systems design
- Escort ship construction



### Saiwaimachi plant Isahaya plant

- Torpedo, Shipboard systems production



## Kobe Shipyard & Machinery Works

- Submarine design, construction



## Nagoya Guidance & Propulsion Systems Works

- Missile, Space systems, Aero engines design, production



## Sagamihara Machinery Works

- Special Vehicles design, production



## Yokohama Dockyard & Machinery Works

- Escort ship repair



## Nagoya Aerospace Systems Works

### Tobishima plant

- Aircraft, Space systems assembly



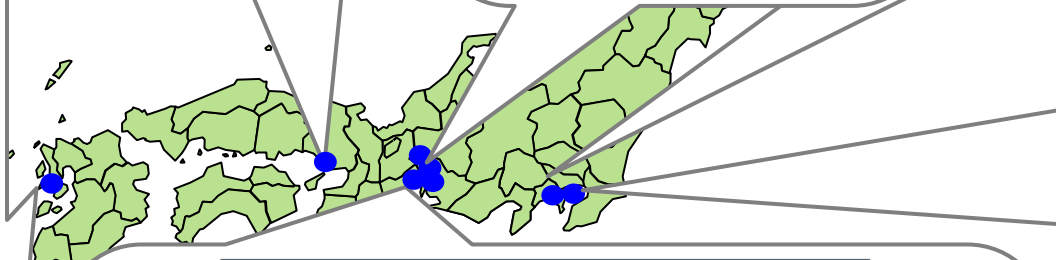
### Oye plant

- Aircraft design, Space products design, machining parts



### Komaki South Plant

- Aircraft assembly, flight test

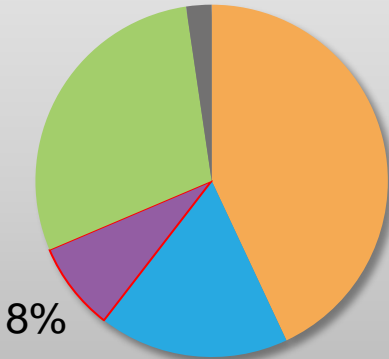


Number of Employees (consolidated) 6,022

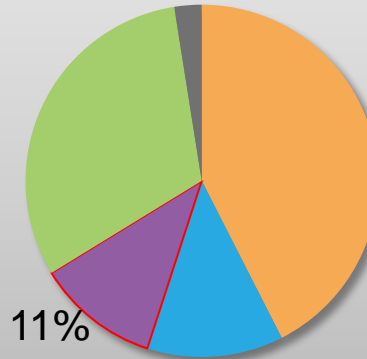
# 1-3. Positioning of Integrated Defense & Space Systems

## ● Percentages of Total Company Orders Received, Net Sales, Operating Income

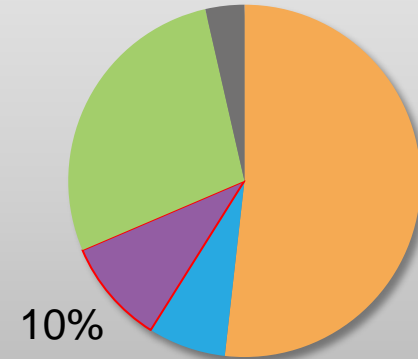
### Orders Received



### Net Sales



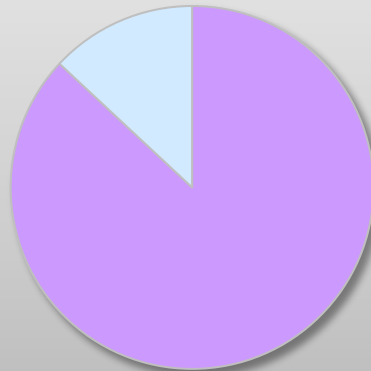
### Operating Income



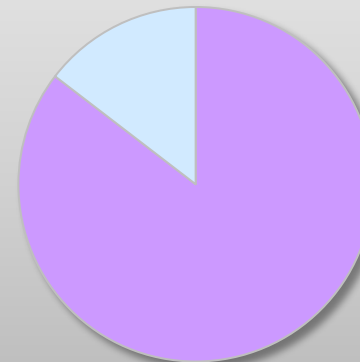
(FY2014)

## ● Breakdown of Domain Orders Received, Net Sales

### Orders Received



### Net Sales



Defense  
Space systems

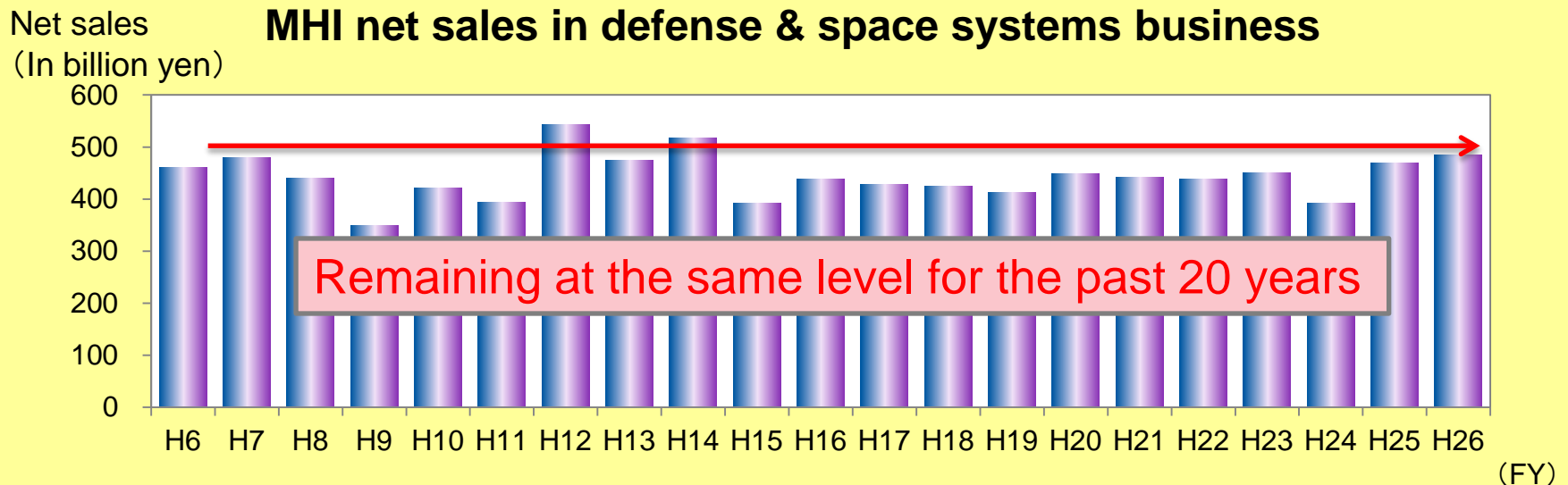
(FY2014)

## **2. Review of 2012 Medium-Term Business Plan**

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### Business environment to date

Owing to government budget constraints, domain net sales have remained stable at over 400 billion yen, and ratio of operating income to net sales at 6%, for the past 20 years.



- In addition to business specialized for domestic market, new earnings pillars are needed.
- Domain's financial foundation is strong.



### Changes in business environment

#### **Formulation of new National Defense Program Guidelines and Medium-Term Defense Program (December 2013)**

- Policy focused on building a Dynamic Joint Defense Force

#### **Cabinet approval of Three Principles on Transfer of Defense Equipment and Technology (April 2014)**

- Establishment of clear principles for transferring defense equipment overseas

#### **New Basic Plan for Space Policy (January 2015)**

- Clearly indicating promotion of space utilization for national security and maintenance/strengthening of domestic production and technological base



### **Opportunities for business scale expansion**

### Defense

- Proactive proposal of products and services responding to new national security environment, leveraging synergies spanning multiple business divisions.

### Space systems

- Promotion of sales activities targeting acquisition of orders from overseas and commercial satellite users, leveraging strengths in reliability and high quality.

**In all 3 years, orders received, net sales and operating profit exceeded targets.  
Net sales near 400 billion yen and operating profit near 6% were consistently achieved.**

(In billion yen)

	FY2012		FY2013		FY2014	
	Target	Actual	Target	Actual	Target	Actual
Orders received	350.0	405.9	450.0	547.3	350.0	417.4
Net Sales	390.0	391.6	450.0	469.4	450.0	483.9
Operating income	15.0	21.9	24.0	27.6	27.0	28.5
Operating income ratio	3.8%	5.6%	5.3%	5.9%	6.0%	5.9%

## Defense

### Achievements

- Development of products leveraging synergies between all business divisions. (Orders received for OZZ-X unmanned underwater vehicles.)
- Start-up of major new businesses (F-35A, type 12 surface-to-ship missile, maneuver combat vehicle, type 12 torpedo)



Start of preparations to manufacture F-35A fighter



Start of production of type 12 surface-to-ship missiles



Completion of maneuver combat vehicle prototype

### Challenges

- Development of equipment contributing to Dynamic Joint Defense Force, and expansion into new markets in response to Three Principles on Transfer of Defense Equipment and Technology.

### Space systems

#### Achievements

- To date, 26 consecutive successful launches of H- II A/H- II B launch vehicles (world's highest success rate: 96.9%)
- Completion of development of H- II A Upgrade Project (enhanced capacity to inject a satellite closer to geostationary orbit)
- New orders, including from overseas, for satellite launch services
  - September 2013: Telesat's communications/broadcasting satellite (first overseas order involving commercial satellite)
  - March 2015: Dubai EIAST's\* observation satellite
- Start of development, as prime contractor, of New National Flagship Launch Vehicle



December 3, 2014  
Launch of Hayabusa 2  
using H- II A launch vehicle  
No.26

\* EIAST: Emirates Institution for Advanced Science and Technology

#### Challenges

- **Further increases in orders for launch services from overseas and commercial satellites.**
- **Business development of national security area responding to Basic Plan for Space Policy.**

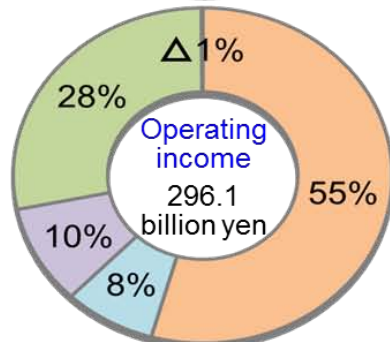
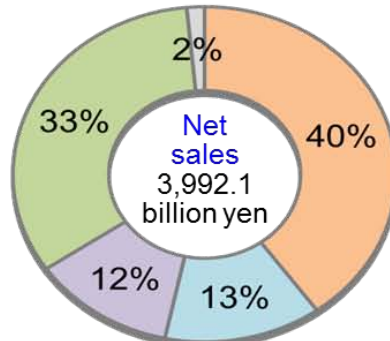
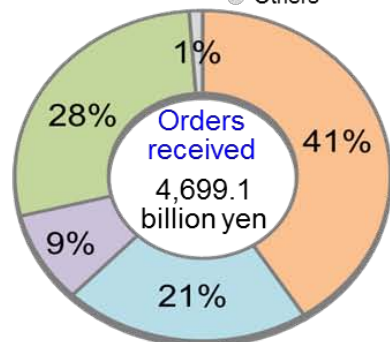
# **3. 2015 Medium-Term Business Plan**

# 3-1. 2015 Business Plan : Outline

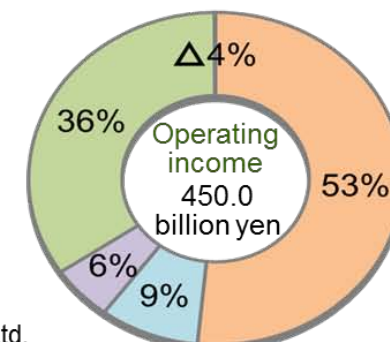
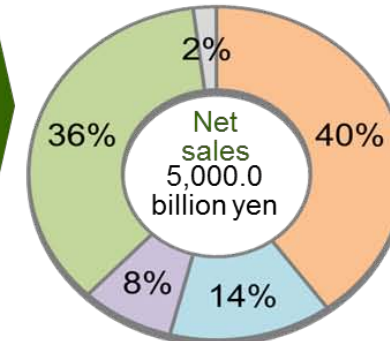
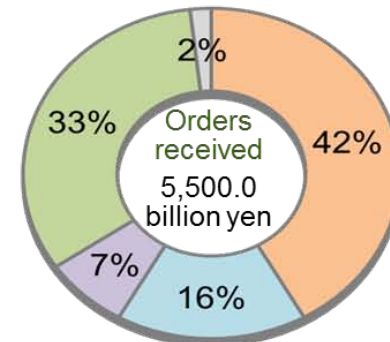
**FY2014**

- Energy & Environment
- Commercial Aviation & Transportation Systems
- Integrated Defense & Space Systems
- Machinery, Equipment & Infrastructure
- Others

**FY2017**



Domain	Main measures and fluctuating factors	Orders/Net sales	Operating income
Energy & Environment	• Expanded synergies at MHPS	○	○
	• Overall expansion of servicing business	○	○
	• Distributed power sources, oil & gas, etc.	○	-
Commercial Aviation & Transportation Systems	• Expansion of Boeing-related business	○	○
	• MRJ (contribution to net sales starting FY2017)	○	△
	• Strengthening of land transportation systems	-	○
Integrated Defense & Space Systems	• Reform of commercial ship business	-	○
	• Demand to hold steady through FY2017; preparations for expansion of business in equipment, etc.	-	-
Machinery, Equipment & Infrastructure	• Synergies at Primetals (steelmaking business)	○	○
	• Strengthening of compressors, turbochargers, etc.	○	○
	• Accelerated business restructuring (including M&A's)	○	○



MHPS: Mitsubishi Hitachi Power Systems, Ltd.

MRJ: Mitsubishi Regional Jet

Primetals: Primetals Technologies, Ltd.

### Integrated Defense & Space Systems domain's orders received, net sales, operating income

(In billion yen)

	FY2014 (Actual)	FY2015 (Forecast)	FY2016 (Target)	FY2017 (Target)
Orders received	4,174	4,000	4,000	4,000
Net Sales	4,839	4,500	4,000	4,000
Operating income	285	270	240	250
Operating income ratio	5.9%	6.0%	6.0%	6.3%

**During 2015 Business Plan time frame, orders, sales and profits are projected to remain generally stable.**



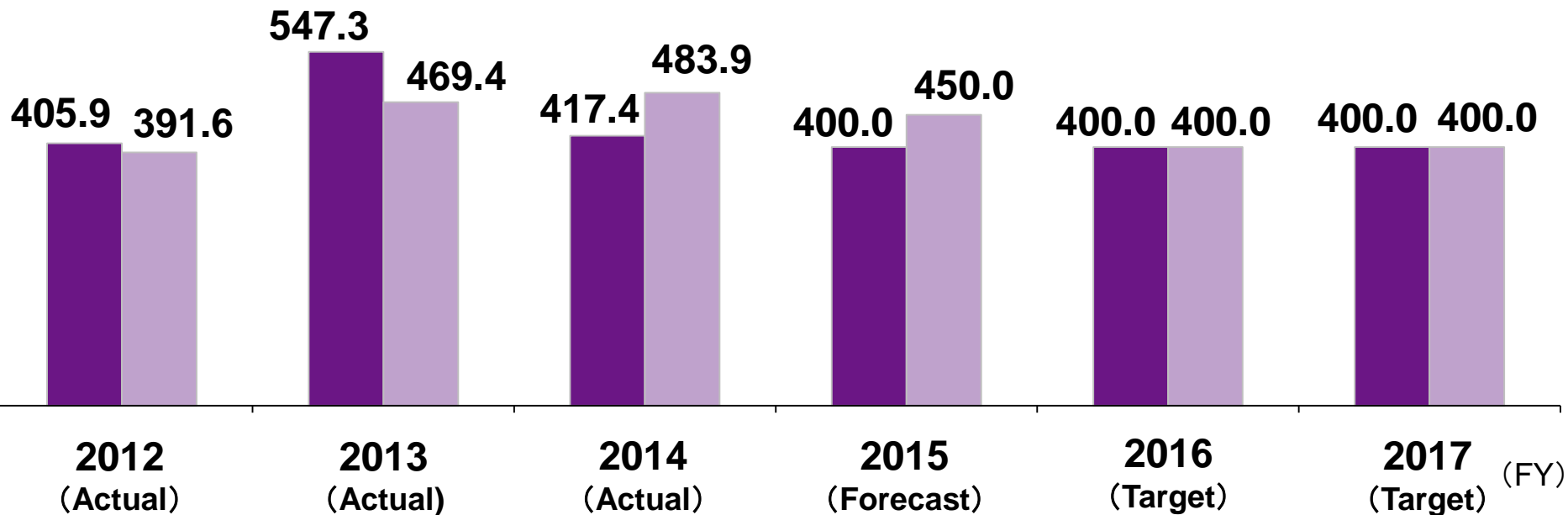
## 3-2. Management Numerical Targets

Orders received, net sales, operating income: FY2012-FY2017





**2012 Business Plan  
(2012~2014)**

**2015 Business Plan  
(2015~2017)**

■ Orders Received   
 ■ Net Sales   
 ◆ Operating income   
 (In billion yen)



### 3-3. 2015 Business Plan: Growth strategies

Business Domain	Strategies	Main Measures
 <p>Energy &amp; Environment</p>	<ul style="list-style-type: none"> <li>• Simultaneously pursue short-term earnings and mid/long-term growth, with business expansion and profitability at the core (swift response to moves made by mega competitors)</li> <li>• Promote long-term continuation policy for nuclear power business</li> </ul>	<ul style="list-style-type: none"> <li>• Enter markets for high-performance models (large-scale GT); enhance lineups</li> <li>• Strengthen servicing business (employ ICT and big data; invest human resources)</li> <li>• Expand networks of domestic and overseas manufacturing bases</li> <li>• Expand business in distributed power generation systems (joint development with Machinery, Equipment &amp; Infrastructure domain)</li> <li>• Full-scale entry in oil &amp; gas upstream business (keeping collaborations and M&amp;A's in view)</li> </ul>
 <p>Commercial Aviation &amp; Transportation Systems</p>	<ul style="list-style-type: none"> <li>• Improve profitability of commercial airplane products</li> <li>• Advance MRJ development and improve airframe value</li> <li>• Undertake bold conversions in commercial and cruise ship businesses</li> <li>• Expand business in land transportation systems</li> </ul>	<ul style="list-style-type: none"> <li>• Promote increased production in businesses for Boeing and develop next-generation production processes</li> <li>• Steadily carry forward the MRJ's development and develop a high-volume manufacturing base</li> <li>• Develop a new infrastructure export model based on domain synergies</li> <li>• Develop new business model for cruise ship business</li> <li>• Strengthen ability to promote business in large-scale overseas projects (Doha, etc.)</li> </ul>
 <p>Integrated Defense &amp; Space Systems</p>	<ul style="list-style-type: none"> <li>• Undertake sustained strengthening of existing businesses and prepare for next expansion step (initiatives to promote overseas business and conversion to commercial market needs)</li> </ul>	<ul style="list-style-type: none"> <li>• Undertake concentrated strengthening of integrated defense systems (land, sea, air)</li> <li>• Newly launch a state-of-the-art technology business department and promote the following:                             <ul style="list-style-type: none"> <li>- Development of new overseas businesses through tieups with overseas partners</li> <li>- Development consumer demand-based businesses applying dual-use technologies</li> </ul> </li> </ul>
 <p>Machinery, Equipment &amp; Infrastructure</p>	<ul style="list-style-type: none"> <li>• Along with the Energy &amp; Environment domain, pursue achievable and immediately effective measures from the perspective of supporting the MHI Group's scale and earnings</li> </ul>	<ul style="list-style-type: none"> <li>• Promote and accelerate PMI in metals machinery and forklift trucks</li> <li>• Expand oil &amp; gas business involving compressors</li> <li>• Establish a global business structure for turbochargers</li> <li>• Further accelerate business restructuring (including M&amp;A's)</li> </ul>

## Basic Policy

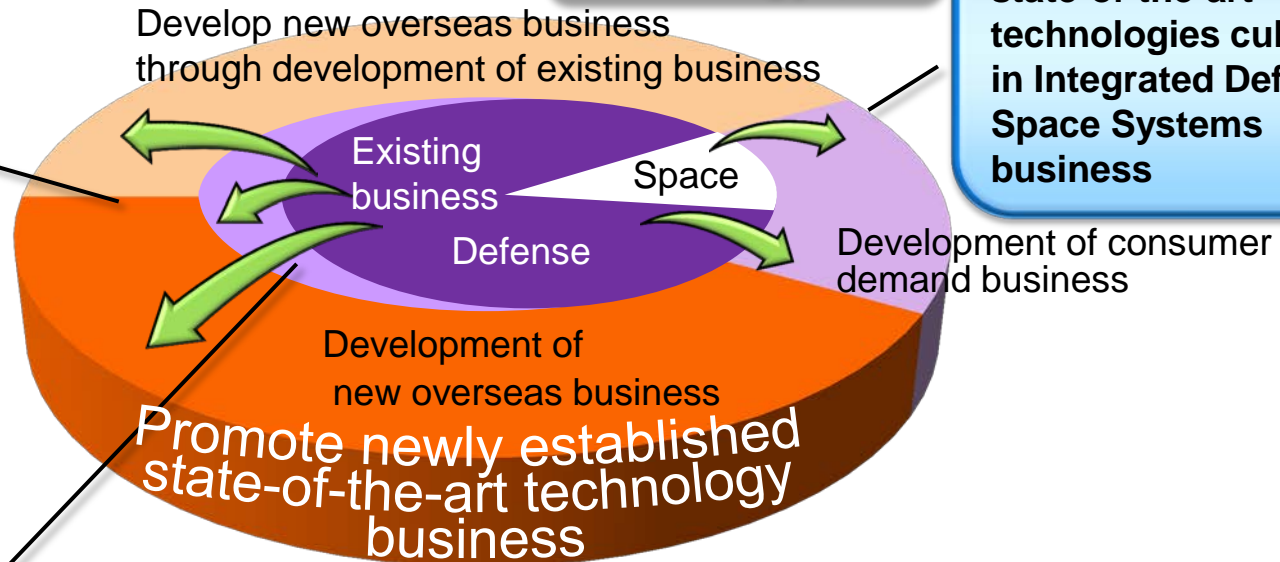
Undertake sustained strengthening of existing business and prepare for next expansion step (initiatives to promote overseas business and conversion to commercial market needs)

### Growth Strategy①

Expand overseas operations leveraging “Three Principles on Transfer of Defense Equipment and Technology”

### Growth Strategy②

Expand consumer demand leveraging state-of-the-art technologies cultivated in Integrated Defense & Space Systems business



### Growth strategy③

Through land/sea/air/space synergies, expanded orders in domestic defense business

# 4. Business Strategies

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## Product Lineup



F-2 Fighter



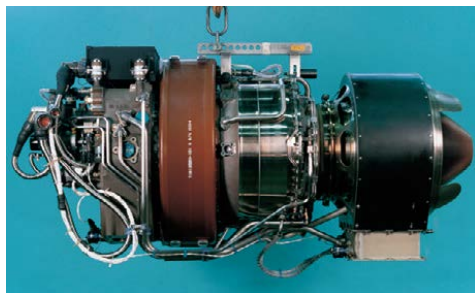
SH-60K Maritime Patrol Helicopter



Destroyer ASHIGARA



Submarine HAKURYU



TS1 (Turboshaft)



Torpedo



PAC-3



SM-3



Type 10 Main Battle Tank

## Market Environment

- Domestic equipment-related defense budget in declining trend  
⇒ Domestic equipment business scale to remain flat
- Dynamic Joint Defense Force buildup policy in Medium-Term Defense Program (FY2014-FY2018)  
⇒ Acceleration of development and procurement of new equipment enabling "response to an attack on offshore islands", "response to ballistic missile attacks, "responses in cyberspace and outer space", etc.
- Cabinet approval of Three Principles on Transfer of Defense Equipment and Technology  
⇒ Expansion of overseas business, especially international joint development

## Basic Policy

- Strengthening and development of existing business
- Foundation laying and new business development, toward growth and expansion in next business plan



## Main Projects

### Main equipment in Medium-Term Defense Program



Aegis ship



SH-60K



F-35A



Modernize F-15



PAC-3MSE  
(MSE: Missile Segment Enhancement)



Submarine



Type 12 surface-to-ship missile

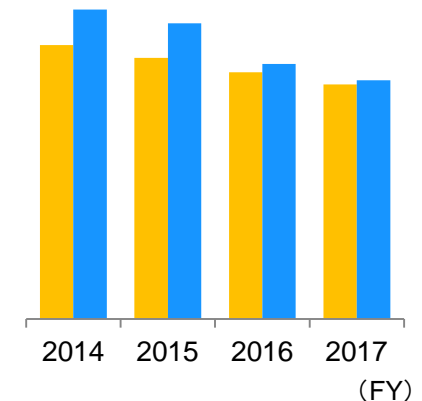


Maneuver combat vehicle



Type 10 Main Battle Tank

■ Orders received ■ Net sales



## Product Lineup



H-II A Launch Vehicle



H-II B Launch Vehicle



(Courtesy of JAXA/NASA)

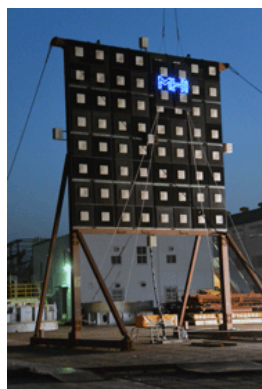
H-II Transfer Vehicle (HTV) KOUNOTORI



LE-7 Rocket Engine



Utilization of Space Environment



Space solar power systems  
(Wireless Power Transmission Technology)



International Space Station  
Japanese Experiment Module (JEM)  
"Kibo"



Reaction Control System

## Market Environment

- Commercial satellite launch demand: 20-25 units/year ⇒ New U.S. companies entering market.
- Formulation of new Basic Plan on Space Policy
  - ① Maintaining and strengthening of space industry and science/technology base
    - ⇒ Domestic space-related market scale to expand to cumulative 5 trillion yen over next 10 years
  - ② Strengthening of security capability employing space
    - ⇒ Expanding demand for products and services relating to early warning capability, maritime domain awareness and space situational awareness, etc.

## Basic Policy

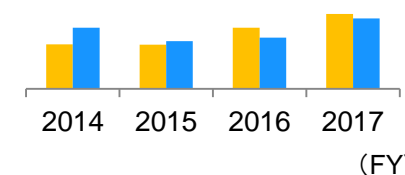
- Strengthening of competitiveness in launch services, primarily creating H- II A launch vehicle upgrade and New National Flagship Launch Vehicle
- Development of space business in national security field, under new Basic Plan on Space Policy



## Main Projects

Launch Schedule	Mission Loaded Satellite
FY2015	"KOUNOTORI5" (HTV5) by H- II B Launch Vehicle No. 5
	Telesat, New High Throughput Satellite, "TELSTAR 12V"
	New exploration X-ray Telescope "ASTRO-H"

■ Orders received  
■ Net sales





### Based on growth strategies, promote activities in 4 business areas

#### Growth Strategy①

Expand overseas operations leveraging “Three Principles on Transfer of Defense Equipment and Technology”

Area 1

Develop new overseas business through development of existing business

Defense

Area 2

Development of new overseas business

#### Growth Strategy②

Expand consumer demand leveraging state-of-the-art technologies cultivated in Integrated Defense & Space Systems business

Area 3

Development of consumer demand-based products through dual use of state-of-the-art technologies

Defense

Space systems

#### Growth Strategy③

Through land/sea/air/space synergies, expanded orders in domestic defense business

Area 4

Expansion of domestic defense business

Defense

Space systems

# 4-4. Area 1 Develop new overseas business through development of existing business

Utilize international joint development knowhow cultivated through Japan-U.S. joint development of SM-3 missile

Defense  
Submarine

- Examination of business in the areas MHI's technology is applicable, within the framework of Japanese government's defense equipment collaboration with other countries

## SM-3 Block II A



- Missile to intercept ballistic missiles fired from Aegis-equipped destroyers
- Implementation of Japan-U.S. joint development starting in 2006
- Export of component parts to U.S. Navy

## Submarine



- Currently supporting cooperation by Japanese Government relating to Australia's future submarine program


## Participation in new international joint development projects, leveraging technologies and experience

**Defense**  
New overseas business

- Application of advanced technologies cultivated through domestic defense/space business
- Application of channel development through international joint business and licensing business


### Creation of advanced technologies

**special sensor technology**



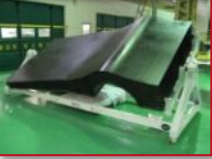
Laser radar

**Electronic technology**



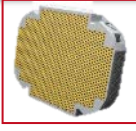
Small satellite

**Lightweight structure technology**




Next-generation Composite Wing Boxes

**Next-generation avionics technology**



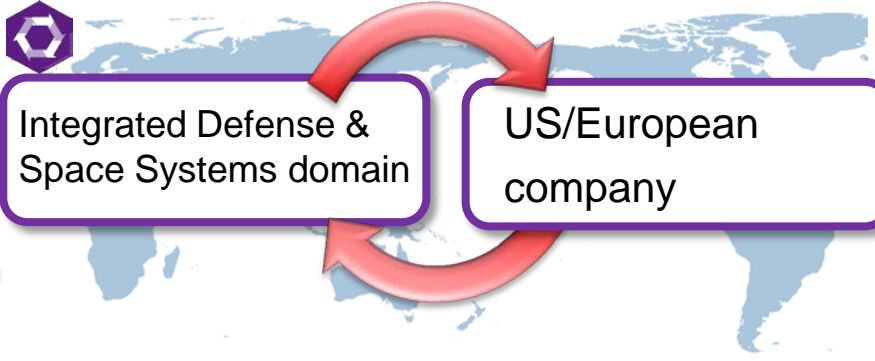
Next-generation radar

**Large scale simulation technology**



- Possession of numerous advanced technologies through development of defense equipment
- Promote continuing research and development of advanced technologies

### New international joint development



- Utilization of close channels with US/European business partners

**Promote development of civilian products using advanced technologies cultivated through development of defense/space products**

Defense

Space systems

Disaster prevention products / Security

- Development of security-related products and services, to protect important infrastructure facilities against physical or cyber terrorism
- Development of highly durable products capable of operating even under special environmental conditions

**Radiation shielded forklift truck**



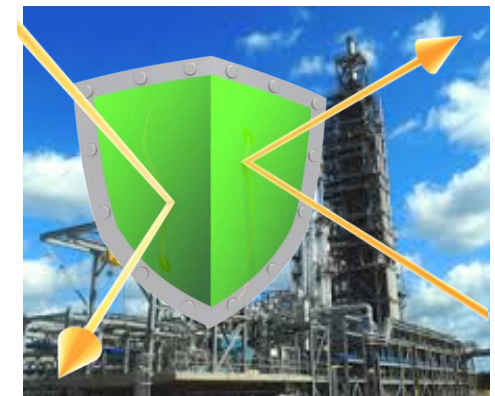
- Application of radiation-resistant technologies cultivated in space equipments to commercial uses

**Disaster response robot**



- Development of disaster response robots through research on unmanned system technology

**Security**



- Products/services to protect important infrastructure facilities against threats of terrorism

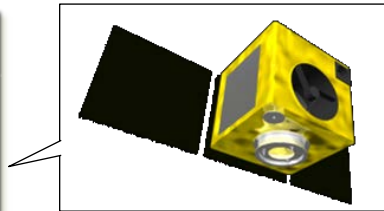
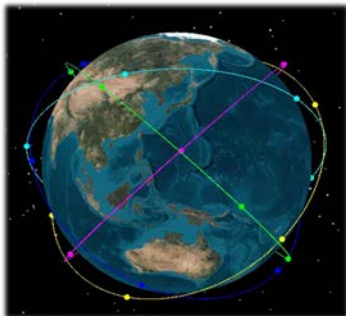
**Expand consumer demand leveraging state-of-the-art technologies cultivated in Integrated Defense & Space Systems business**

**Space systems**

**Small satellite**

**Development, launching and operation of satellite constellation; entry into information gathering and sharing services business**

**Launching and operation of satellite constellation**

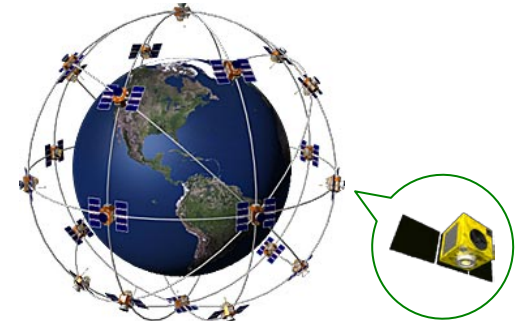


Operating satellite

**Operating satellite constellation and analyzing the information**

- **Development, launching and operation of satellite constellation**

**Development of information gathering and sharing services business**



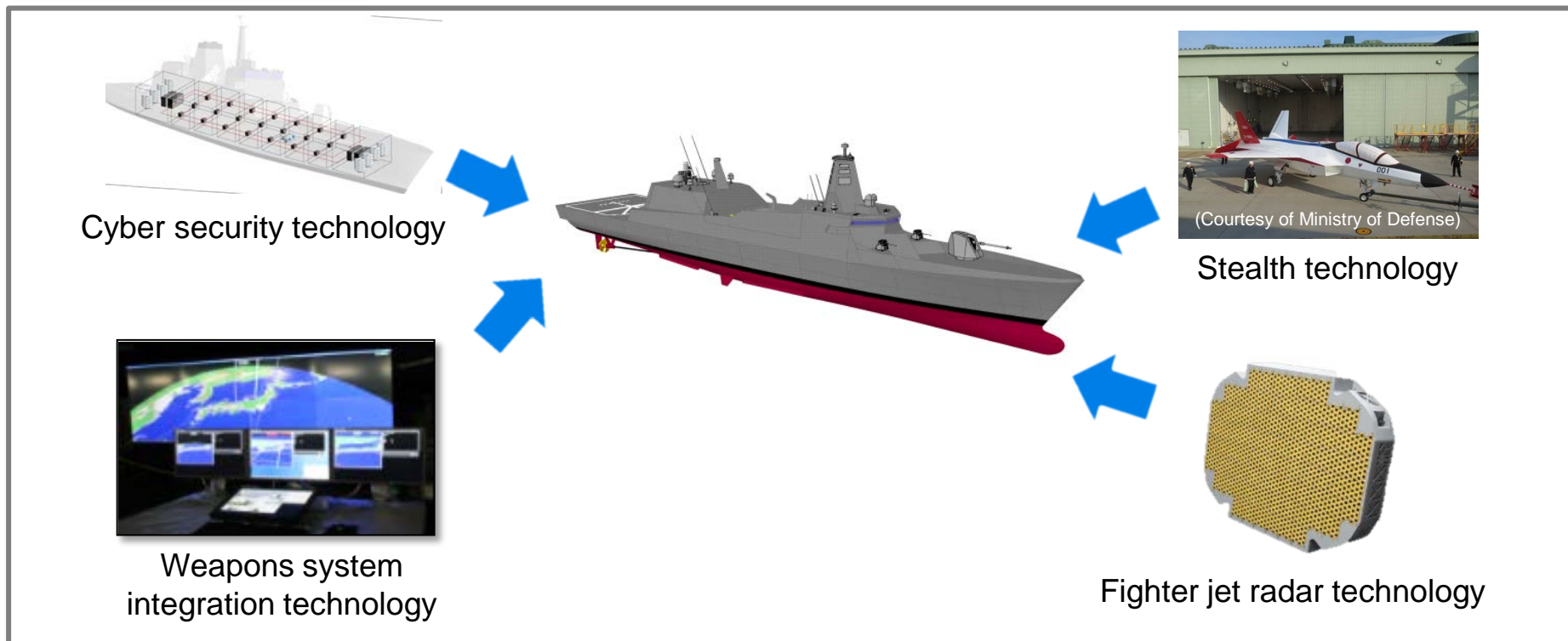
- **Development of business primarily in big data processing**

## Expansion of business integrating areas of expertise in each business division

Defense

New naval ship

- Response to new concepts indicated in Medium-Term Defense Program (new compact-type hull destroyers with multifunctional capabilities)
- System integration leveraging advanced technologies of all business division



**Expansion of business integrating areas of expertise in each business division**

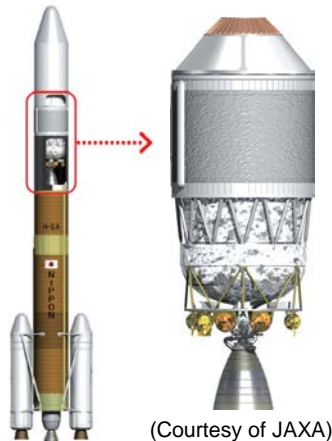
**Space systems**

**Launch services**

- In addition to high quality and reliability cultivated to date, strengthening of competitiveness and response capability to market needs, and expansion of commercial and overseas orders

**H- II A launch vehicle upgrade**

- Upper stage modifications to provide better services for customers



(Courtesy of JAXA)

Launches to commence in second half of FY2015

**New National Flagship Launch Vehicle**

- Strengthening of price competitiveness through cost-reduction initiatives commencing in design phase

Diverse launch capacities depending on payload



Number of Solid Rocket Boosters    0                    2                    4

(Courtesy of JAXA)

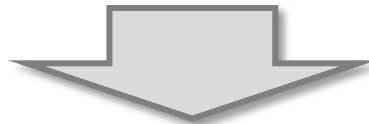
# 5. Summary

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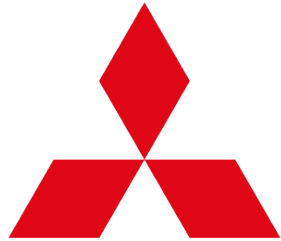
**Target business scale expansion by breaking out of conventional frameworks.**

- ① **Expand overseas operations leveraging “Three Principles on Transfer of Defense Equipment and Technology”.**
- ② **Expand consumer demand leveraging state-of-the-art technologies cultivated in Integrated Defense & Space Systems business.**
- ③ **Through land/sea/air/space synergies, expanded orders in domestic defense business.**



**FY2017 target**

**Completion of preparations toward strong expansion of business scale of Integrated Defense & Space Systems domain.**



**MITSUBISHI  
HEAVY INDUSTRIES, LTD.**

## Our Technologies, Your Tomorrow

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. Also, the results projected here should not be construed in any way as being guaranteed by the company.