

# Business Briefing on Shipbuilding & Ocean Development

Hisashi Hara

Head of Shipbuilding & Ocean Development

June 11, 2012

**MITSUBISHI HEAVY INDUSTRIES, LTD.**

1

# Relationship Between Shipbuilding & Ocean Development and Business Domains

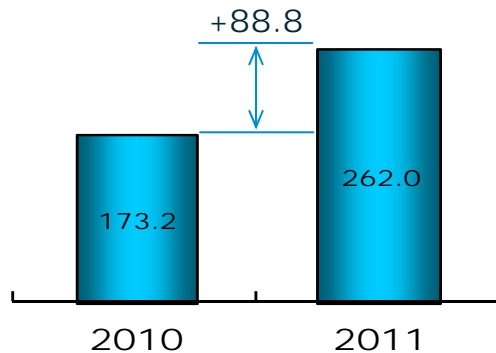
Business domain	Customers/ Markets	Segment					
		Shipbuilding & Ocean Development	Power Systems	Machinery & Steel Infrastructure Systems	Aerospace Systems	General Machinery & Special Vehicles	Others (Air-Conditioning/Machine Tool)
Energy & Environment	<ul style="list-style-type: none"> <li>• Power companies</li> <li>• Gas companies</li> <li>• Resource companies (oil, chemicals, steel)</li> </ul>		<ul style="list-style-type: none"> <li>• GTCC</li> <li>• Large-scale thermal power plants</li> <li>• Nuclear power plants</li> </ul>	<ul style="list-style-type: none"> <li>• Environmental plants</li> <li>• Chemical plants</li> </ul>			
Machinery, Equipment Systems	<ul style="list-style-type: none"> <li>• Core industries (steel, etc.)</li> <li>• Automotive industry</li> <li>• Logistics, etc.</li> </ul>		<ul style="list-style-type: none"> <li>• Stationary engines</li> </ul>	<ul style="list-style-type: none"> <li>• Compressors</li> <li>• Metals machinery</li> <li>• Crane &amp; material handling systems</li> </ul>		<ul style="list-style-type: none"> <li>• Turbochargers</li> <li>• Forklift trucks</li> <li>• Engines</li> </ul>	<ul style="list-style-type: none"> <li>• Air-conditioning equipment</li> <li>• Machine tools</li> </ul>
Transportation	<ul style="list-style-type: none"> <li>• Airlines (air)</li> <li>• Shipping companies (sea)</li> <li>• Railways (land), etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Commercial Ships</li> </ul>		<ul style="list-style-type: none"> <li>• Transportation system</li> </ul>	<ul style="list-style-type: none"> <li>• Commercial aircraft</li> </ul>		
Defense & Aerospace	<ul style="list-style-type: none"> <li>• Ministry of Defense (land, sea, air)</li> <li>• JAXA</li> </ul>	<ul style="list-style-type: none"> <li>• Destroyers &amp; submarines for the Ministry of Defense</li> </ul>			<ul style="list-style-type: none"> <li>• Defense aircraft</li> <li>• Missiles</li> <li>• Space Systems</li> </ul>	<ul style="list-style-type: none"> <li>• Special vehicles</li> </ul>	

1. Review of FY2011  
(Review of 2010 Mid Term Business Plan)
2. Shipbuilding & Ocean Development  
Business Environment
3. Business Policy for Achieving the 2012  
Mid Term Business Plan
4. Domestic Shipbuilding
5. Engineering
6. Overseas Shipbuilding
7. Summary (Vision)

(Billion yen)

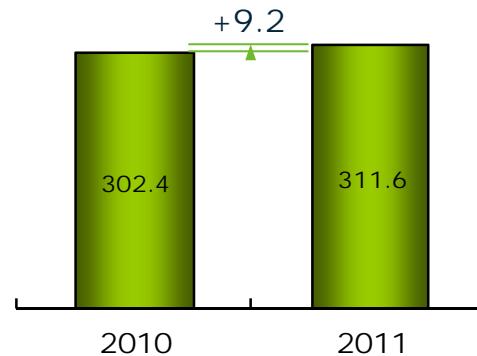
## Orders received

- Up 88.8 billion yen year on year
  - Ships ordered: 12 ships (-5 year on year)
- As a result of targeting orders for high value-added vessels, received orders for 12 ships, including 2 cruise ships and 4 new LNG carriers  
(Breakdown of ships ordered)
- |              |          |
|--------------|----------|
| First half:  | 2 ships  |
| Second half: | 10 ships |



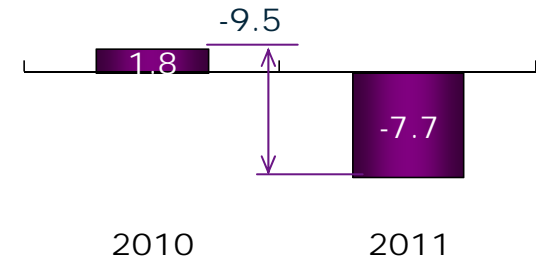
## Net sales

- Up 9.2 billion yen year on year
  - Ship deliveries: 25 ships (+2 year on year)
- (Breakdown of deliveries)
- |                   |         |
|-------------------|---------|
| Car carrier       | 7 ships |
| Container carrier | 3 ships |
| RO-RO             | 3 ships |
| VLCC              | 3 ships |
| LPG carrier       | 2 ships |
| Surveying vessel  | 1 ship  |
| Escort ship       | 1 ship  |
| Patrol vessel     | 5 ships |



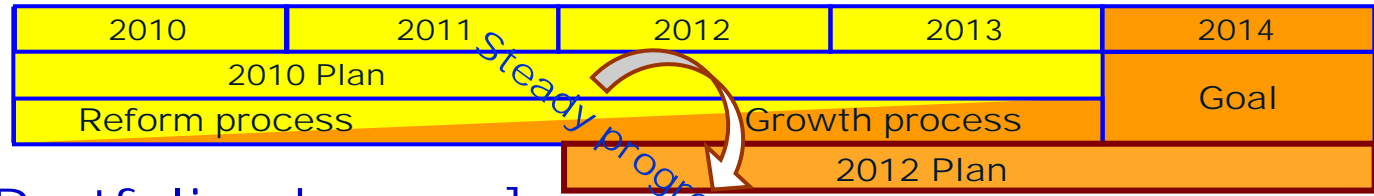
## Operating profit

- Down 9.5 billion yen year on year
- Profits were reduced by the stronger yen and other factors, resulting in an operating loss.

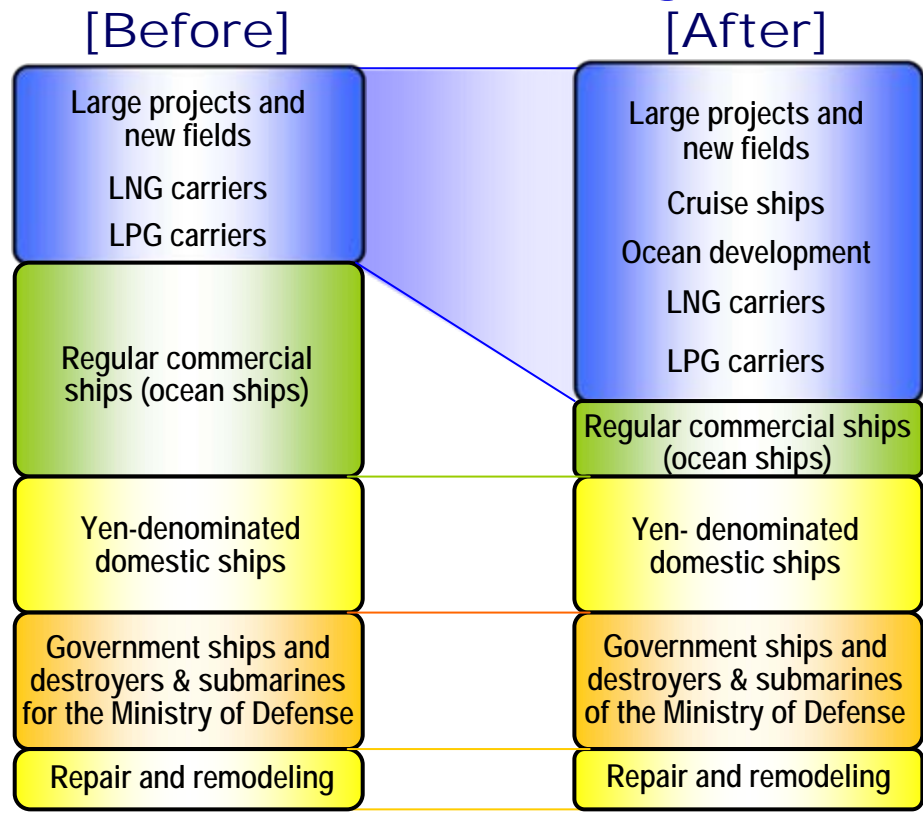


# 1. Review of FY2011 (Review of 2010 Mid Term Business Plan) (2)

Steady progress in strategies for receiving orders (portfolio changes), development of a production system, increase in our technological edge, and increase in cost competitiveness that conform to the changes taking place in the business environment



## [Portfolio changes]



**Main initiatives under the 2010 plan and their progress**

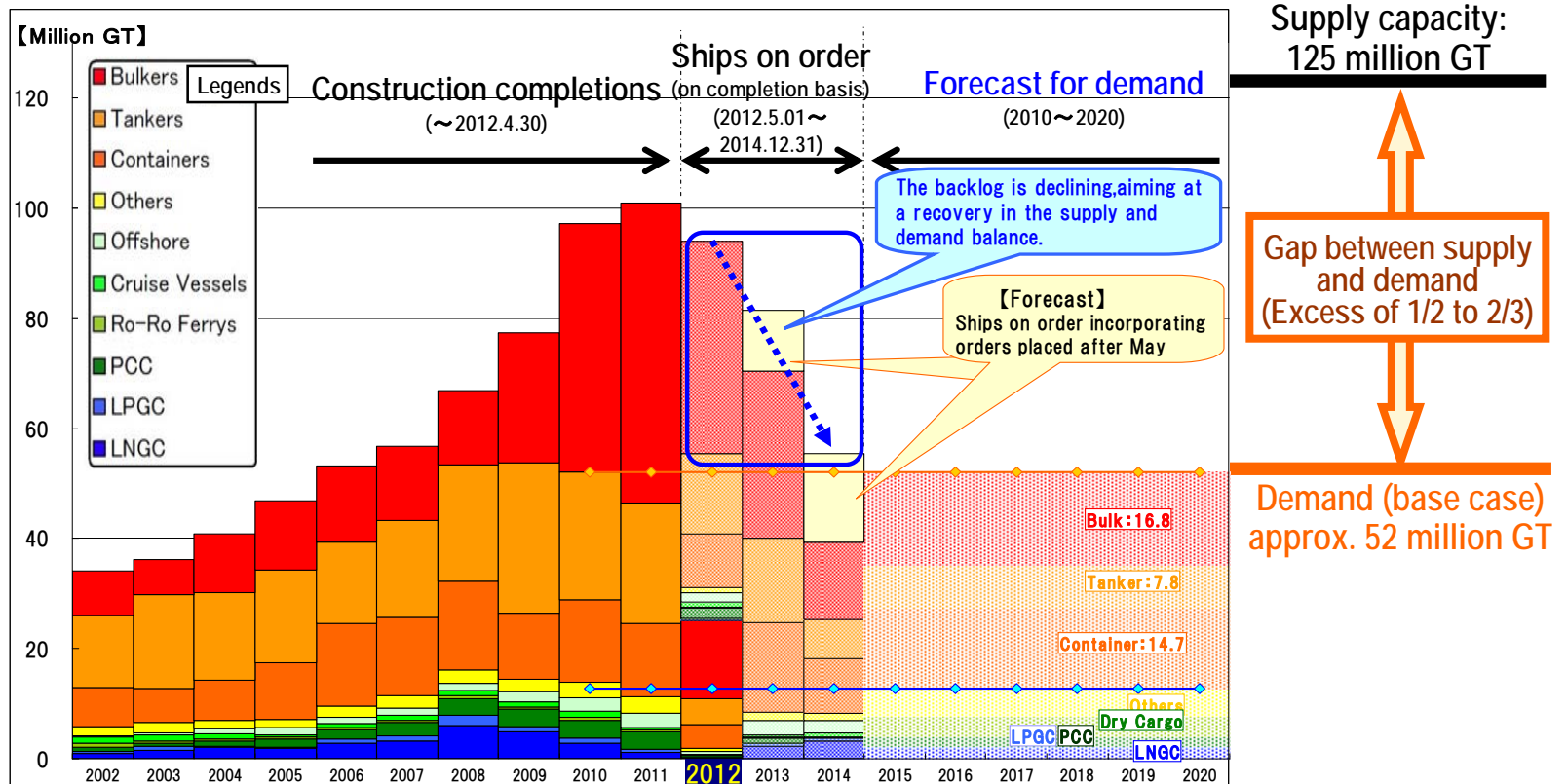
- Portfolio changes (See the chart at left)
  - Shifting the axis of the core businesses
  - Steady progress with orders received for cruise ships, ocean development (Seismic vessels), and next-generation LNG carriers
- Development of production system
  - Withdrawal from commercial shipbuilding at Kobe Shipyard - June 2012
  - Concentrate commercial shipbuilding at Nagasaki Shipyard and Shimonoseki Shipyard
- Increase of technological edge
  - Operation with environmental and energy saving technologies at the core
  - Business expanding through development of MALS (Mitsubishi Air Lubrication System)
- Increase of cost competitiveness
  - Reduction of material costs with the VPAC<sup>[\*]</sup> procurement strategy and reduction of construction cost through productivity improvement

[\*] VPAC: Value Engineering/Package Deal/Asian Production/Competition in Price

## 1) Market environment (Order backlog for newbuildings and forecast for newbuilding demand)

There remains the supply-demand gap attributed to the Lehman Brothers failure of 2008.

- A large volume of orders beyond actual demand had been placed due to strong increase in seaborne cargo before the Lehman's fall.
- Medium-term demand is expected to be 52 million GT (base case).
- With enlarging newbuilding capacity in South Korea and China before the Lehman's fall, supply capacity at 125 million GT is assumed.
- With regard to the supply-demand gap, the supply capacity has continued to be in excess of demand by slightly more than 2 times.



Source: Order backlog for newbuildings, World Shipyard Monitor (Apr. 2012)  
CLARKSON RESEARCH SERVICES LTD.

## 2) Trends in ship prices, exchange rates, and steel material prices

### Probability of continuous severe business environment

#### ◆ Stagnation of ship prices

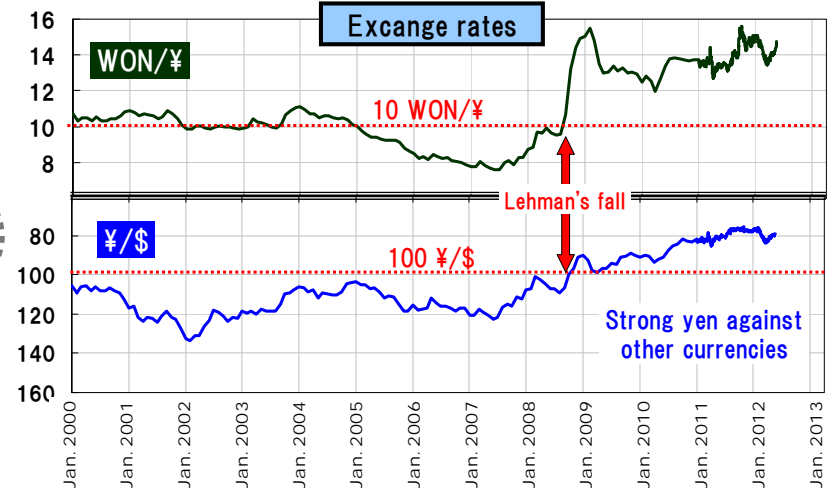
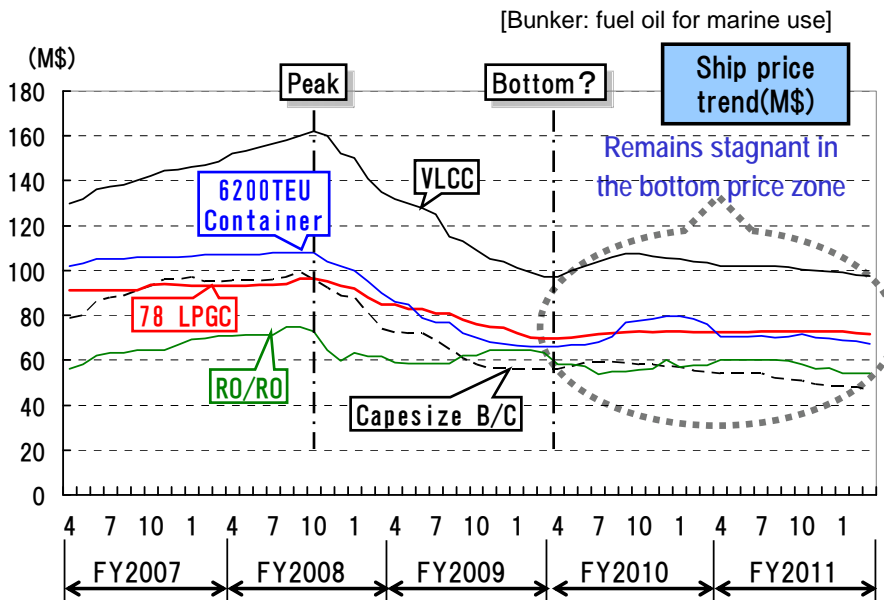
- Future demand for new ships
  - The global economy is uncertain due to the financial uncertainty in Europe. No quick rebound in demand for new ships is likely.
- Stagnation of ship prices
  - Ship prices have hit bottom and begun to pick up, but the rise has been weak. Currently, prices are in a gradual decline.
- Bright outlook?
  - Demand for energy saving, eco ships is rising with high bunker costs and introduction of CO2 emissions index (EEDI)
    - ➔ It works favorably for yards with technical skills.

#### ◆ Steel material prices

- Trends in steel, raw material prices (Q1 of FY2012)
  - Iron ore price: **Down 20% year on year (average)**,
  - **Coking coal price : Down 28% year on year (average)**
- Declining demand for steel materials
  - Demand for steel material for shipbuilding is expected to remain low for some time.
- Expansion of steel material supply capacity
  - Thick plate production facilities at major South Korean mills are to be expanded. **The supply-demand balance will loosen in Japan.**

#### ◆ Exchange rates

- Strong yen against other currencies has become the ordinary.



### 3) Summary

- ◆ The supply and demand gap remains due to the enlarged newbuilding capacity in South Korea and China. Moreover, the state of excess of space has continued due to building of excessive number of ships in anticipation of demand.
- ◆ Shipyards in Japan have become less competitive given the increased competitiveness of Korean shipyards due to weaker won, growth of Chinese shipyards, and the appreciation of the yen against other currencies. Seaborne cargo has been on an upward trend, but not enough to eliminate the excess of space, resulting in stagnant freight rates. Consequently, shipping companies generally remain careful.
- ◆ Due to these circumstances, ship prices have been declining gradually. Now they are approx. 30% lower compared with the period before Lehman's fall.
- ◆ On the other hand, there are also expectations for demand for newbuildings due in part to the increase in demand for newbuildings of LNG carriers reflecting demand for alternative energies, activation of oil and gas resources development reflecting soaring crude oil prices, and the revival of alternative demand for domestic vessels that had stopped newbuildings due to the impact of the earthquake.



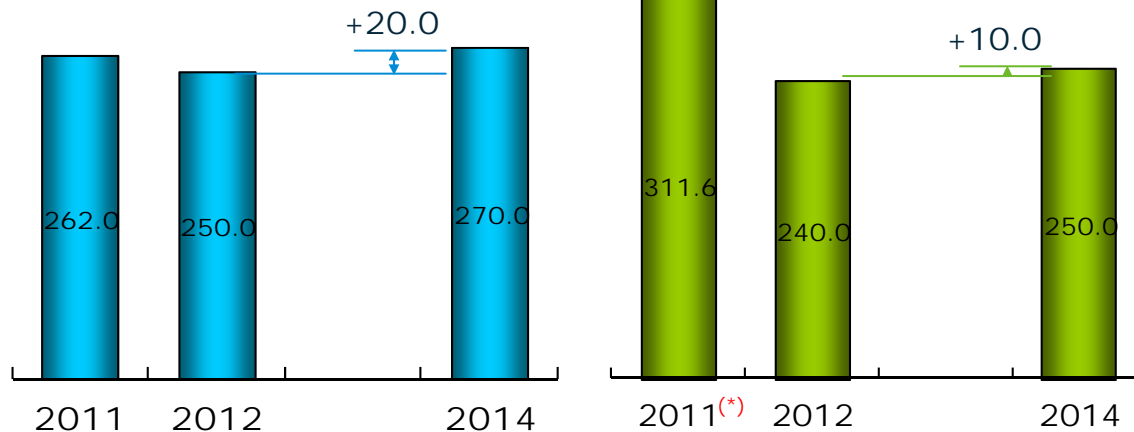
### 3. Business Policy for Achieving the 2012 Mid-Term Business Plan (1)

(Billion yen)

#### Orders received

#### Net sales

- Aim to receive 270 billion yen in orders and achieve net sales of more than 250 billion yen under the 2012 Plan (FY2014), by securing orders for products based on advanced technologies and high added value, including cruise ships, LNG carriers, destroyers & submarines for the Ministry of Defense, and government ships, and by expanding the engineering business.



(\*) Net sales increased in this year due in part to the change of accounting standard.

#### Operating profit

- Aim to achieve operating profit exceeding 8 billion yen under the 2012 Plan through expansion of the engineering business, in addition to profitability improvement through the production system and saving purchasing costs.



#### Basic strategies

Change the business model by making use of advanced technologies and the strength of the brand. Establish the business foundations and execute internal reforms to compete effectively and achieve new development.



#### Reinforce domestic shipbuilding.

- (1) Establish cruise shipbuilding as a core business by successfully completing the new cruise ships No.1 and No. 2.
- (2) Differentiate ourselves with products based on advanced technologies and high added value, such as the new LNG carrier and marine resource research vessels.
- (3) Strengthen leading defense ship technology.
- (4) Ensure competitiveness by saving factory costs by accelerating construction of a sustainable system.

#### Towards the future, accelerate efforts to go beyond organic growth.

- (5) Expand engineering business based on high performance hull forms and high energy saving technologies.
- (6) Develop overseas business including possibility of establishing Joint Venture.

## Basic strategies

Build **engineering** and **overseas shipbuilding** businesses in addition to **domestic shipbuilding** that is differentiated with products based on advanced technologies and high added value.

### Domestic shipbuilding (core business)

- Differentiate ourselves with products based on advanced technologies and high added value (cruise ships, new LNG carriers, ocean surveying vessels, research vessels, etc.)

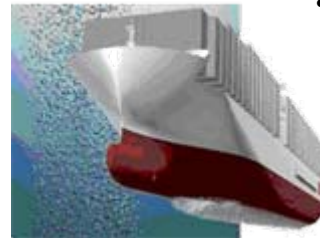


Nickname: "Sayaendo" (string bean)



- Strengthen leading defense ship technology.

### Engineering



- Expand engineering business based on superior hull forms and energy saving technologies.

### Overseas shipbuilding



- Develop overseas business
  - Signed technical collaboration agreement for supporting Kattupalli Shipyard of L&T Shipbuilding
    - With possibility of establishing a joint venture

Establish cruise shipbuilding as a core business by successfully completing the new cruise ships No.1 and No. 2.

### Top priorities for the newbuildings

- (1) Total optimization on the initiative of Cruise Ship Project Dept.
  - Pursuit of total optimization of quality, cost, and delivery
- (2) Further optimization of design by thorough application of 3D design.
  - Intensive advance verification of integration between design and construction by 3D models.
  - Sophisticated logistics management by the upgraded shipbuilding BOM [\*]
- (3) Innovate construction method and optimized construction regime
  - Wider utilization of "Unit Cabin" construction method, steel plate printing system and the 3D viewer.
  - Purpose-driven investment for cruise shipbuilding facilities and establishment of construction regime utilizing external resources such as general constructors.

### Actions for establishing cruise shipbuilding as a core business

- (1) Innovative cruise ship business model  
(For Intellectual-Property-oriented model)
  - Development of an integrated on-board energy management system(EMS)
  - Providing highly efficient, energy-saving equipment (Exert the strength of a comprehensive manufacturer.)
- (2) Fundamental development for continuous construction of cruise ships
  - Shorter work periods through continuous development of laser welding technology and wider application of MD[\*]
  - Building up the global supply chain including Asian suppliers.

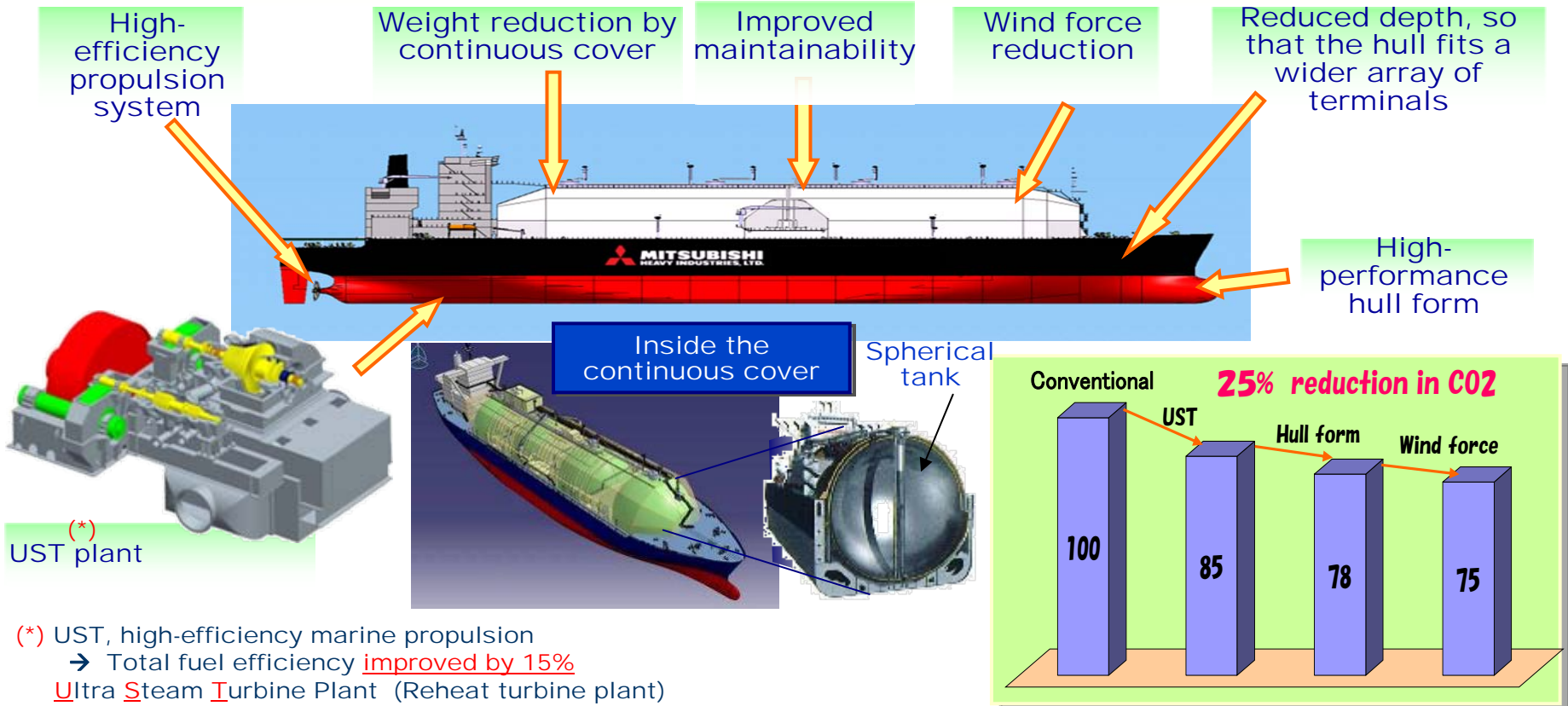


[\*] BOM: Bill Of Material  
MD: Modular Design

Differentiate ourselves with products based on advanced technologies and high added value, such as new LNG carrier and marine resource research vessels.

## “Sayaendo” next-generation MOSS LNG carrier (155km<sup>3</sup> type)

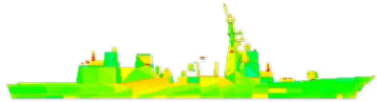
**Design concept** Improved economic efficiency, navigation performance, and environmentally friendly performance



## Strengthen leading defense ship technology

### Stealth technologies

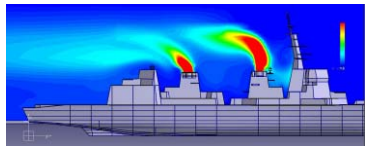
Low radar reflection



Low noise / vibration

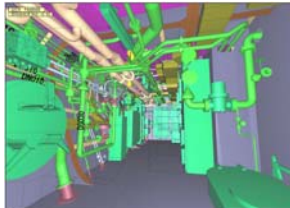


Low infrared emission



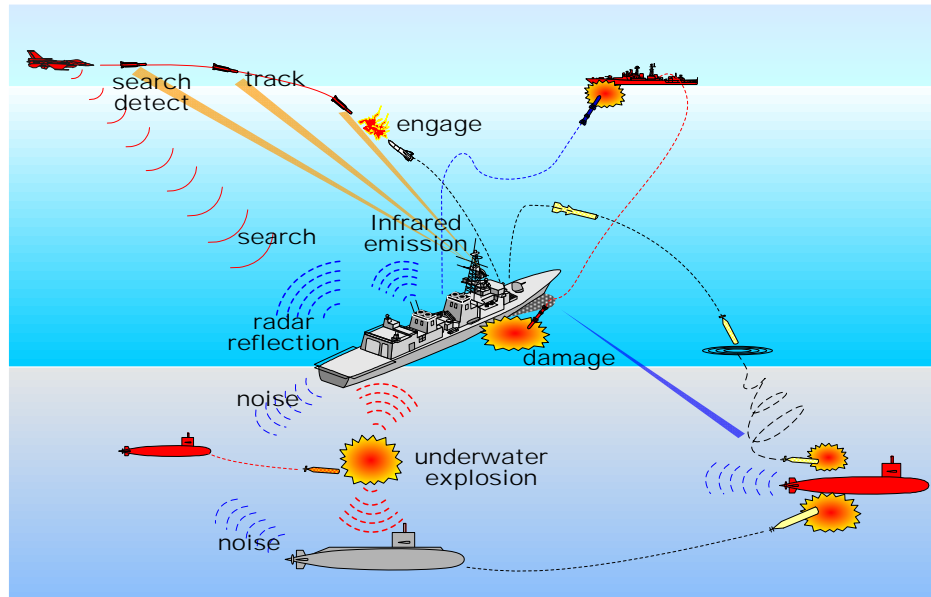
### High density outfitting

Full application of 3D CAD system to achieve high density outfitting



### Combat system integration

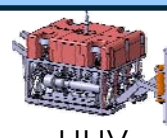
Integrate state of the art combat system to verify search, detect, track and engagement function



### Underwater technology



Submarines



UUV



AUV

### Damage control

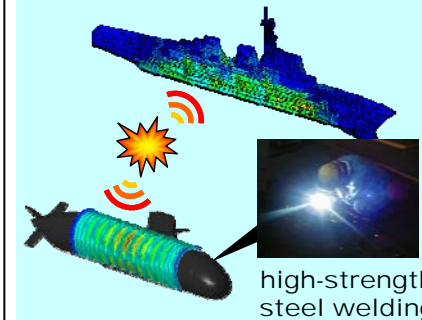
Design for flood control & fire fighting



Survivability under contaminated environment

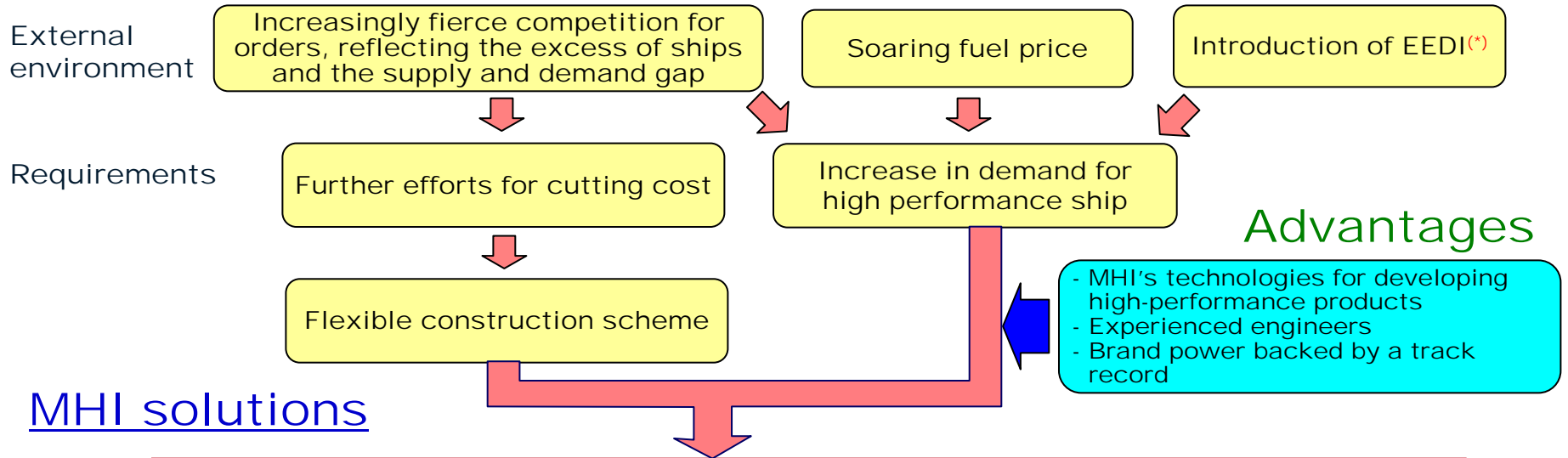


Design & engineering for underwater explosion



high-strength steel welding

## Expand engineering business based on superior hull forms and energy saving technologies.



### ➤ 1) Shipbuilding engineering

- Providing superior hull forms and advanced analytical designs. Supporting other shipyards in the design area.
- Dispatching personnel to offer technical guidance to improve construction efficiency

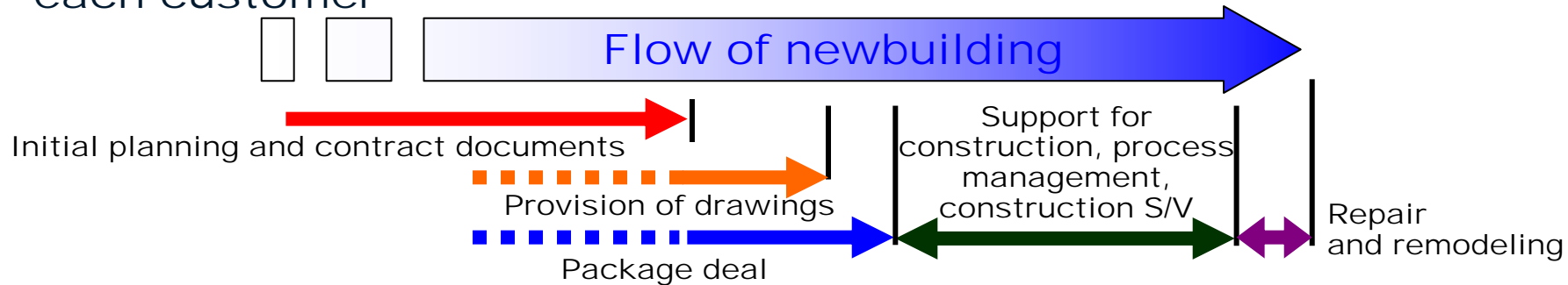
### ➤ 2) Marine solution provider

Providing as packages energy saving, environmental products we have developed

(\*) EEDI (Energy Efficiency Design Index) is regulating CO<sub>2</sub> emissions from international seaborne shipping based on specified lower limits of transport energy efficiency of ships. They were adopted at IMO last year and regulations will start from 2013.

MHI solution: 1) Shipbuilding engineering

- Providing a wide range of solutions, from initial response to after-sales services, depending on the needs and capability of each customer



**Domestic**

Collaboration with Oshima Shipbuilding Co., Ltd.

Provision of concept design of high-performance bulk carriers and Mitsubishi Air Lubrication System(MALS)



Collaboration with Imabari Shipbuilding Co., Ltd.

- Concluded a comprehensive technical collaboration agreement on container ships
- Joint development of car carriers

**Overseas**

Collaboration with Sinopacific Shipbuilding Group Co., Ltd. of China

Provision of concept design of high-performance bulk carriers

Under negotiations with multiple shipyards are underway with respect to container ships and other types of ships.



Yangzhou Dayang Shipbuilding, a Sinopacific Shipbuilding Group company



## MHI solution: 2) Marine solution provider

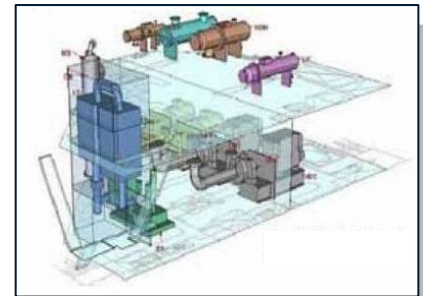
- Providing as packages the energy saving, environmental products we have developed
  - ★ **Mitsubishi Air Lubrication System (MALS\*):**  
Significantly improves the performance of newly built ships and ships in service (adopted for cruise ships and bulk carriers) [MHI's unique technology]
  - ★ **Engineering for installing the ballast water treatment system on ships in service:**  
Provided to shipping companies [Industry leader in the number of installation works experienced]
  - ★ **Gas fuel supply system (MHI-GEMS\*):**  
A key technology for ships which use LNG as fuel (received an order for a test bench for Mitsui Engineering & Shipbuilding Co., Ltd.) [MHI's unique technology]
  - ★ **Scrubber for removing SOx:**  
A device for cleaning emission gas to comply with tighter emissions controls [MHI's unique technology]
  - ★ **LNG re-liquefaction plant and open rack vaporizer for re-gassification:**  
Key devices for building an LNG supply chain [MHI's unique technology]



(\*)MALS: Mitsubishi Air Lubrication System



(\*)MHI-GEMS: Device module and system for gas injection engine (test equipment)



LNG re-liquefaction plant

Develop overseas business including possibility of establishing Joint Venture.

Entering into market by tying up with local leading companies.  
Working with possibility of establishing a joint venture.

Collaboration work with L&T Group in India, etc.

Providing various support by granting license, consulting and training for the construction of commercial ships to LTSB<sup>(\*)</sup>  
(Renewable 3 years contract)

### [Support details]

(Consulting on shipbuilding technology)

- End of May: Consultant deployment

(Accommodating trainees)

- Middle of May: Receiving trainees

(\*) L&T Shipbuilding Limited (LTSB)



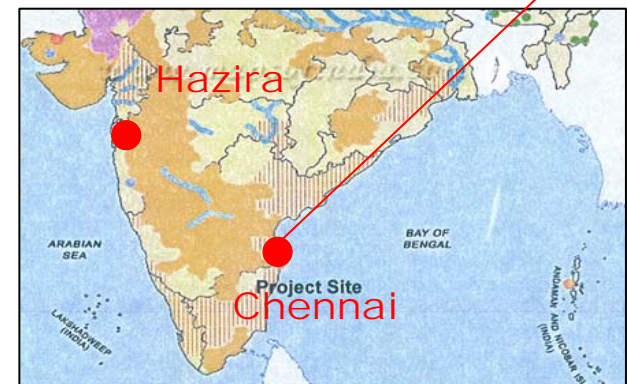
[Signing ceremony with LTSB]



[Kattupalli Shipyards of LTSB]

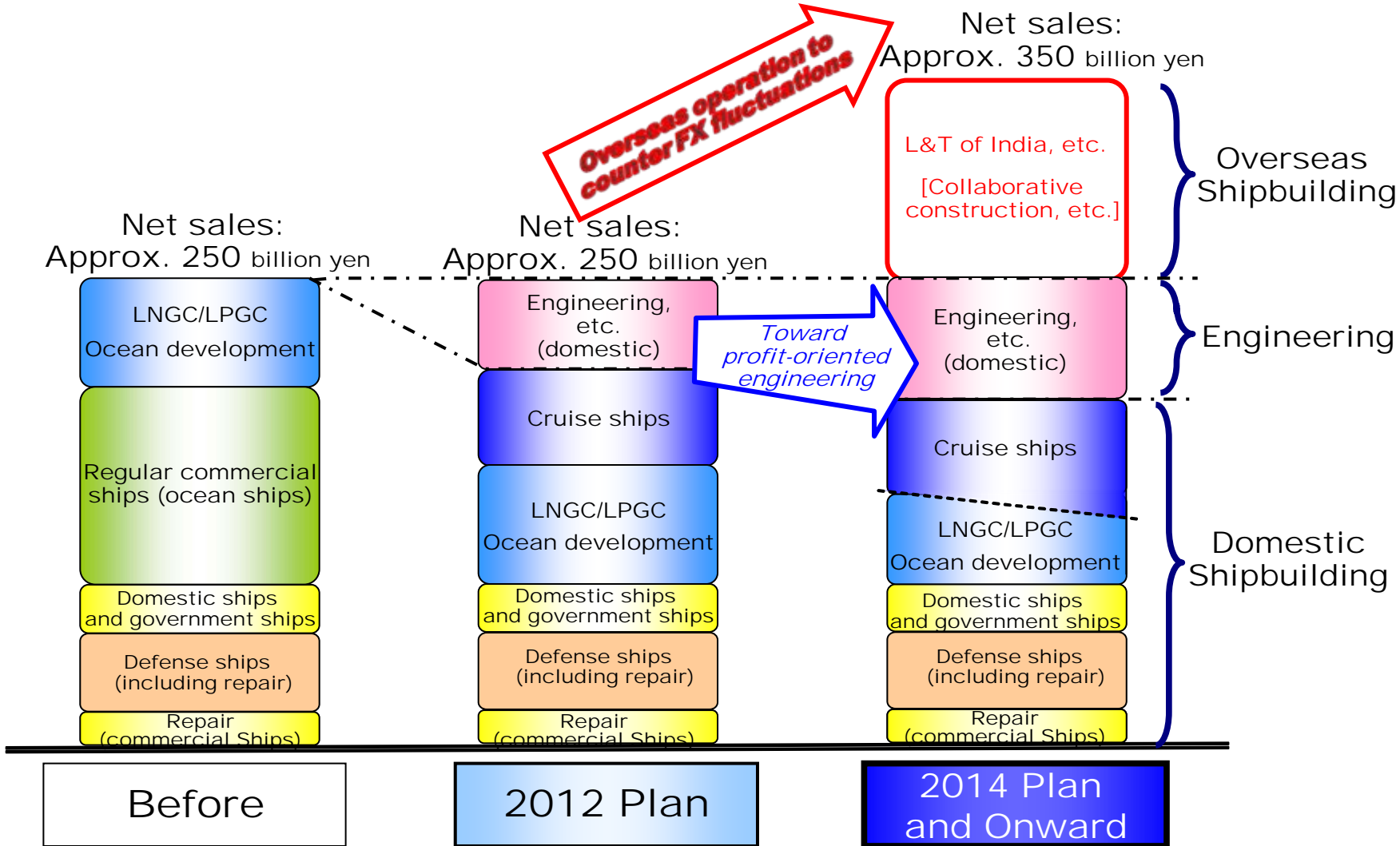


[Guidance given at LTSB]



# 7. Summary (Vision)

Expand the business scale with engineering and overseas shipbuilding business.





## Our Technologies, Your Tomorrow

A red arrow graphic pointing to the right, positioned below the main headline.

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.