Cooperation between Brazil and Japan in Offshore and Shipbuilding business

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Historical Review of shipbuilding industry

1940s
- The WWII
- Mass production of standardized vessels

1950s
- Increase of oil transport, and the 1956 Suez crisis
- Enlargement of vessels

1960s-1970s
- Increase of seaborne trade
- Enlargement of vessels

1980s
- Oil crisis
- Energy efficient vessels

1990s
- MARPOL Double hull tanker, and specialized vessels, such as container vessels, PCC, RORO, Ore bulk carrier

2000s
- LNG, eco-friendly vessels

(note) 1. Data Source: Lloyd's Register, United Nations, The Japanese Shipowners' Association
2. Ship Size Coverage: 100 Gross Tonnage and over.
Neworders by builder country

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2. Ship Size Coverage: 100 Gross Tonnage and over.
Present and future situation of Japanese shipbuilding

Japanese Shipbuilding

Any types of ships

Competitive advantage in a wide range of products

energy-saving ships

Traditional Line-up

Towards new and growing markets

LNG carrier

Offshore segments

Offshore wind energy

Logistics hub

Installation and maintenance

Pure Car Carrier

LNG Shuttle tanker

Bulk Carrier

Wind turbines

Container Ship

Oil Tanker

Japanese Shipbuilding

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Container Ship

Oil Tanker
Japan’s maritime technologies cover wide areas, however…

- **Marine equipment**
- **Green ship (energy saving technologies)**
- **Marine research vessels and AUVs**
- **FPSO, Offshore support vessel, LNG Tank**
- **High Speed Vessel**
- **Large Floating Offshore Structure (Mega Float)**
Challenges – 1: Stagnating ship prices

Tankers – VLCC
Tankers – Suezmax
Tankers – Aframax
Tankers – Handysize
Bulk carriers – Capesize
Bulk carriers – Panamax
Bulk carriers – Handymax
Bulk carriers – Handysize
Japanese yen has been weakening against US dollar since the end of 2013. Now is a good opportunity to buy Japanese high-quality eco-ships and energy-saving products!
Strategies – 1:

Eco-ships for all range of products
Environment surrounding Eco ships and Energy saving products

Tightening of regulations on CO\textsubscript{2} emission from ships

New IMO regulations adopted in 2011

- **Phase 0** 2013 ~ 14
- **Phase 1** 2015 ~ 19
- **Phase 2** 2020 ~ 24
- **Phase 3** 2025 ~

EEDI (g-CO\textsubscript{2}/tonne-mile)

- 10 %
- 20 %
- 30 %

Baseline

DWT

New ships shall meet the EEDI\textsuperscript{*} requirement which will become stringent in phases until 2025.

\textsuperscript{*} Energy Efficiency Design Index

Rising fuel price

Crude oil prices will rise due to increasing demand in developing countries and other reasons.

Crude Oil Prices

Source: BP, Statistical Review of World Energy 2013

Growing demand for eco-ships and energy-saving products:

NOTE: Eco means both ecological and economical.
Japan’s Business and Government Initiative

- To meet the EEDI requirements in advance, Japanese industries have endeavored and been successful to develop new energy-saving technologies.
- Such technologies cover a variety of factors to generate considerable effects collectively.
Japanese Advanced Eco-Ships

**IBIS WIND**  
(Sanoyas Holdings Corporation)

- The vessel has improved fuel consumption by 10% compared to the existing SANOYAS PANAMAX bulk carrier, keeping a loading capacity of 83,000mt which is the biggest in this category.

**Clipper Excalibur**  
(Mitsui Engineering & Shipbuilding Co., Ltd.)

- This vessel's fuel oil consumption is less than that of a conventional Supramax bulk carrier despite its enlargement.
- This unprecedented “wide beam shallow draft vessel” called “neo 66BC” was delivered in November 2013 for the first time.

**“SAYAENDO”**  
a series of new type LNG vessels  
(Mitsubishi Heavy Industries CO., LTD.)

[Graph showing CO2 Reduction per cargo unit: approx. 25% with conventional and improved hull forms.]
Japanese energy-saving products

**Engine**

- **UEC Eco-Engine**
  (Mitsubishi Heavy Industries marine machinery & engine CO., LTD.)

- **Dual fuel engine 6EY26DF**
  (YANMAR CO., LTD.)

- **Dual fuel engine DE28DF / MD36DF**
  (DAIHATSU DIESEL MFG.CO., LTD.)

**Paints**

- **A-LF-Sea**
  - Ultra low Friction Underwater Coating System
  (NIPPON PAINT MARINE COATINGS., LTD.)

- **SEAFLO NEO SLZ**
  (CHUGOKU MAEINE PAINRS, LTD)

**Others**

- **GPX PROPELLER**
  (NAKASHIMA PROPELLER CO., LTD.)

- **VTI Turbochargers**
  (Mitsubishi Heavy Industries Marine machinery & engine CO., LTD.)

Realization of ultra low friction.
Japan is back: Recovery in Japanese shipbuilding

JPY/USD exchange rate and export contracts received by Japanese shipyards

World shipbuilding completions

Source: Clarkson Research Service
Strategies 2: Re-entry into offshore segments

Being aware that we are behind, what to do?
Number of offshore drilling structures completed and oil prices
(Total of drill ship, semi-submersible, jack-up rig)

Era of a booming ocean development

Dominated by Korea, China and Singapore

Oil crisis

2003 Iraqi war

Trend of offshore drilling structures and oil prices

Crude oil prices (US$/barrel)

No.

USA
Japan
South Korea
Singapore
China
Brazil
その他

USA

Oil prices: statistical review of world energy 2013 workbook
## SWOT analysis for Japan’s shipbuilding industry

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**Cooperation with foreign countries by utilizing technologies and production management of Japan**

- Non-existence of oil and gas fields in Japan, no training and trial opportunities  
- Emerging resource protectionism  
- Weakening economic power of Japan in relative term
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**Cooperation with and production:** Promotion of offshore industry in line with technologies from countries like China, India and South Korea.
Why Brazil?

Maybe the only gateway to offshore market for Japan
Matching between Brazil and Japan

**Brazil**

**NEEDS**
- Establishment and promotion of domestic maritime industries
- Coping with strong and growing demand for the exploitation of offshore oil & gas fields

**STRENGTH**
- Rich human & natural resources
- State-of-the-art technology in the offshore sector, in particular, sub-sea

**Japan**

**NEEDS**
- Catching up from “blank” period of Japanese industry in the offshore market

**STRENGTH**
- A variety of leading companies that can offer “total solution” including the logistics
- Long-time experiences in overseas investment and cooperation, including the enhancement of local employment
- Reliable and energy-efficient maritime technologies
- Competitive financial options

**WIN-WIN**
Actions in Government level

Aug. 2011  □ The 1st Technical Roundtable Meeting between Brazil and Japan
□ MOU was signed between SINAVAL and Japan Maritime Equipment Association (JSMEA)

Feb. 2012  □ Dispatch of an MLIT official to Japanese Consulate in Rio de Janeiro

Mar. 2012  □ Seminar on Brazil Offshore Oil and Gas Exploitation in Japan

May 2012  □ Signing of Memorandum on Cooperation on Maritime Technology and Industry between MDIC and MLIT

July 2012  □ The 2nd Roundtable

Nov. 2012  □ Dispatch of an MLIT official to JETRO in São Paulo

Feb. 2013  □ Approval for establishment of J-DeEP

May. 2013  □ Meeting of Ministers (MDIC and MME with METI, Japan)

Aug. 2013  □ The 3rd Roundtable


Aug. 2014  □ The 4th Roundtable
Japan’s business and government initiatives

Public and private sectors work together to facilitate Brazilian offshore development.

Direct investment in the shipyards in Brazil

Japanese shipbuilders have recently invested in Brazilian shipyards and are working on ship building in Brazil.

Development of human resources in shipbuilding sector

- In June 2013, JICA project on technical cooperation in the shipbuilding human resource development was adopted.
- The project will start within 2014.

Promotion of marine machinery and equipment industry

Government support to the Japan’s machinery and equipment industry to overcome their technological challenge in the offshore market.

Coping with the local content issues

In December 2012, Nippon Kaiji Kyokai do Brasil LTDA (ClassNK in Brazil) was authorized by ANP as a certifying organization of the local content.

Specific projects in Brazil’s offshore development

Japanese maritime industries may contribute to the offshore development in Brazil through technology-based projects such as Logistics Hub.

Continuous private-public discussions between Brazil and Japan

Roundtable meetings
Recent progress

Direct investment in Brazilian shipyards

**Estaleiro Atlântico Sul (EAS) (Pernambuco)**
- June 2012: JMU (Japan Marine United) started technical cooperation with EAS
- June 2013: IHI, JMU and JGC invested in EAS

**Estaleiro Enseada do Paraguacu (EEP) (Bahia)**
- May 2012: KHI (Kawasaki Heavy Industries) invested on EEP

**Estaleiro Rio Grande (ERG2) (Rio Grande do Sul)**
- October 2013: MHI (Mitsubishi Heavy Industries), Imabari, Namura, Oshima, and Mitsubishi Corporation invested on ECOVIX
Recent progress

1) Meeting with President Dilma Rousseff
Prime Minister Abe explained the offshore logistics hub systems, and President Rousseff took note of his manifestation.

2) Release of Joint Statement

Key points of Joint Statement
- Strengthening foundation of Brazilian shipbuilding industry
- Financial and human support from Japan: Direct investment in Brazilian shipyards, JICA technical cooperation project
- Memorandum on Cooperation on Maritime Technology and Industry between MDIC and MLIT
- Annual roundtable attended from both public and private sectors
- Deepwater, distant offshore oil E&P: Logistics Hub Systems
- Further strengthened friendship

- Enhancement and expansion of bilateral cooperation
- Develop technologies and products for offshore development through private, academic and administrative cooperation
• The biggest shipyard in the southern hemisphere, and the only VLCC construction shipyard in Brazil.

• JEI, established by IHI, JGC and JMU, acquired 33% share of the EAS by FEB 2014.

• 3 oil tankers have been delivered, 20 Tanker ships and 7 Drill ships have been listed in order book.

Location: Pernambuco, Brazil
Area: 1,620,000m² (Building Area: 167,000m²)
Investor: Camargo Corrêa Group 33%
Queiroz Galvão Group 33%
JEI (IHI, JGC, JMU) 33%
Employee: Around 5,800
(Direct employment 4,560)
Improved accuracy in the production

Connecting the hull blocks in the engine room part: Suezmax tanker C004–C006

- **2012 C004**: Size error: 100mm
- **2013 C005**: Size error: 40mm
- **2014 C006**: Size error: 0mm
Improved production efficiency

Introduction of high-place work vehicle for welding

Before 2014
Hand and semi-automatic welding with scaffold

From January 2014
automatic welding with high-place work vehicle

Progress in the welding work speed

2013
Welding time reduced by 37.5%
Introduce weaving techniques

2014
Welding time reduced by 60.0%

2015
Introduce automatic welding machine
Development of human resources in shipbuilding sector

- **JICA project on technical cooperation in shipbuilding human resource development was adopted in June 2013**, based on the request of MDIC (Ministry of Development, Industry and Foreign Trade) of Brazil. The implementation period is 2014 – 2018 (4 years).
- R/D (Record of Discussion) was finalized on July 28, 2014. The project will start within this year.
- MLIT will dispatch an expert on shipbuilding policy to MDIC in September this year.

**Japan Side**
- JICA
- Shipbuilders

**Brazil Side**
- SENAI
- MDIC

**Dispatch of Experts**
- **Dispatch of Trainees** (SENAI core instructors)

**Policy coordination between MLIT and MDIC**
- **Training for 40 core instructors of SENAI** (4 states: RJ, PE, BA, and RS)
- **Training on shipbuilding policies for 5 officials of MDIC**
- **Introduction of Japanese practices on productivity (e.g., product management)**

**Establishment of road map on policy and measures of shipbuilding industry**
- Development of shipbuilding-specialized training program
- **Training for SENAI instructors by core instructors**
- **Training of workers by instructors**

**Effective and efficient human resource development**

Development of shipbuilding and offshore industries

27
Promotion of marine machinery and equipment industry

In order to assist the Japanese industries to enhance their opportunities in the offshore market, MLIT is providing financial assistance for their technological development. (2013-2017) (Budget: 11.2 million USD in 2013-2014)

- Cargo loading & offloading system
  - Highly reliable LNG tank
  - Cargo loading & offloading system between floating structures

- Storage
  - High efficiency valve for preventing backward flow

- Engine
  - High-capacity power generation system
  - High-capacity motor

- Control system
  - High-accuracy dynamic positioning system
  - Mooring equipment

- Plumbing

- High-capacity power generation system
In cooperation with shipbuilding, shipping and other related companies, MLIT is working on “maturing” Logistics Hub Systems so that it can be robust and efficient transport system. (Budget: 13.8 million USD in 2012-2014)

Concept:
- Logistics Hub system is a hub-and-spoke transportation system that can minimize transportation cost of workers and supplies between land and offshore platforms.
- Will be connected with the land by High Speed Vessels (HSV).
- Will be connected with offshore platforms by helicopters.

**Current System**

**Logistics Hub System**

- 250-300km
- Logistics Hub
- Offshore Platforms
- High Speed Vessels (HSV)
Functions:

- Transportation hub
  - Heliport (takeoff and landing / fueling), helicopter hanger/elevator
  - Air traffic control tower, air surveillance radar, airway beacon
  - Berth for safe and efficient transfer of workers and cargo
  - Cargo storage (fuel, food etc.)
  - Accommodation
  - Workshop for maintenance

- Offshore disaster response base
  - Oil fence, oil treatment, oil adsorbent
  - Fire extinguishant
  - Medical facility
New agency*, to be established in autumn 2014 by MLIT, will back up the financing of projects by holding a considerable portion of the equity of SPC.

* (Official English name is not fixed yet) “Agency for the business support in the overseas transportation and urban/regional development”

* The law to establish this agency was adopted by the National Diet in Feb 2014.
How the funding by the new agency will work

**Scope of funding**
- Projects, to be supported by the new agency, need to be relevant to overseas transport* or urban/regional development.
  * ”Transport” includes not only “traditional” sea transport such as the operation of LNG vessels and container vessels, but also offshore projects such as the operation of FPSO, FLNG, PSV, AHTS and Logistics Hub.
- Co-funding with the JBIC loan is possible

**Where the funding can go**
- Owning/O&M SPC of the Logistics Hub
- Owning/O&M SPC of the FPSO
- Owning/O&M SPC of the PSV/AHTS
- Shipyards in Brazil

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**Example of Finance structure**

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<th>Equity</th>
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<tr>
<td>JBIC</td>
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<tr>
<td>Other Japanese banks</td>
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<tr>
<td>NEXI</td>
<td></td>
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<tr>
<td>BNDES</td>
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<tr>
<td>Japanese companies</td>
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<tr>
<td>NEW Agency</td>
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**Owing/O&M SPC**

**Charter contract & O&M contract**

**Brazilian oil/gas company**
Potential usage of Mega-Float

- Stock yard
- Helicopters
- Offshore support vessels
- Offshore sites
- Shore

Oil stockpiling base

Airport
Multi-layered approach has been taken, and will continue

- Shipbuilding: Coping with the local content requirements, better production management

- Ship machinery and equipment: Adaptation to the offshore standard, establishment of sound after-sales services including quick and stable supply of parts.

- Specific projects where Japan can take an initiative from start-up phase

Business and government coordination, for mutual benefits of the two countries, is the key
Muito Obrigado !