



INTERNATIONAL ASSOCIATION OF MARITIME UNIVERSITIES



# **The 23<sup>rd</sup> World Gas Conference**

PGC D LNG

## **The World LNG Supply Chain - A possible Blind Spot at its Heart**

June 7, 2006 at Amsterdam

**Dr. Hisashi Yamamoto, Secretary, IAMU**

# Conclusion [I]

There seem to be two (2) blind spots:

**1. *Safety***

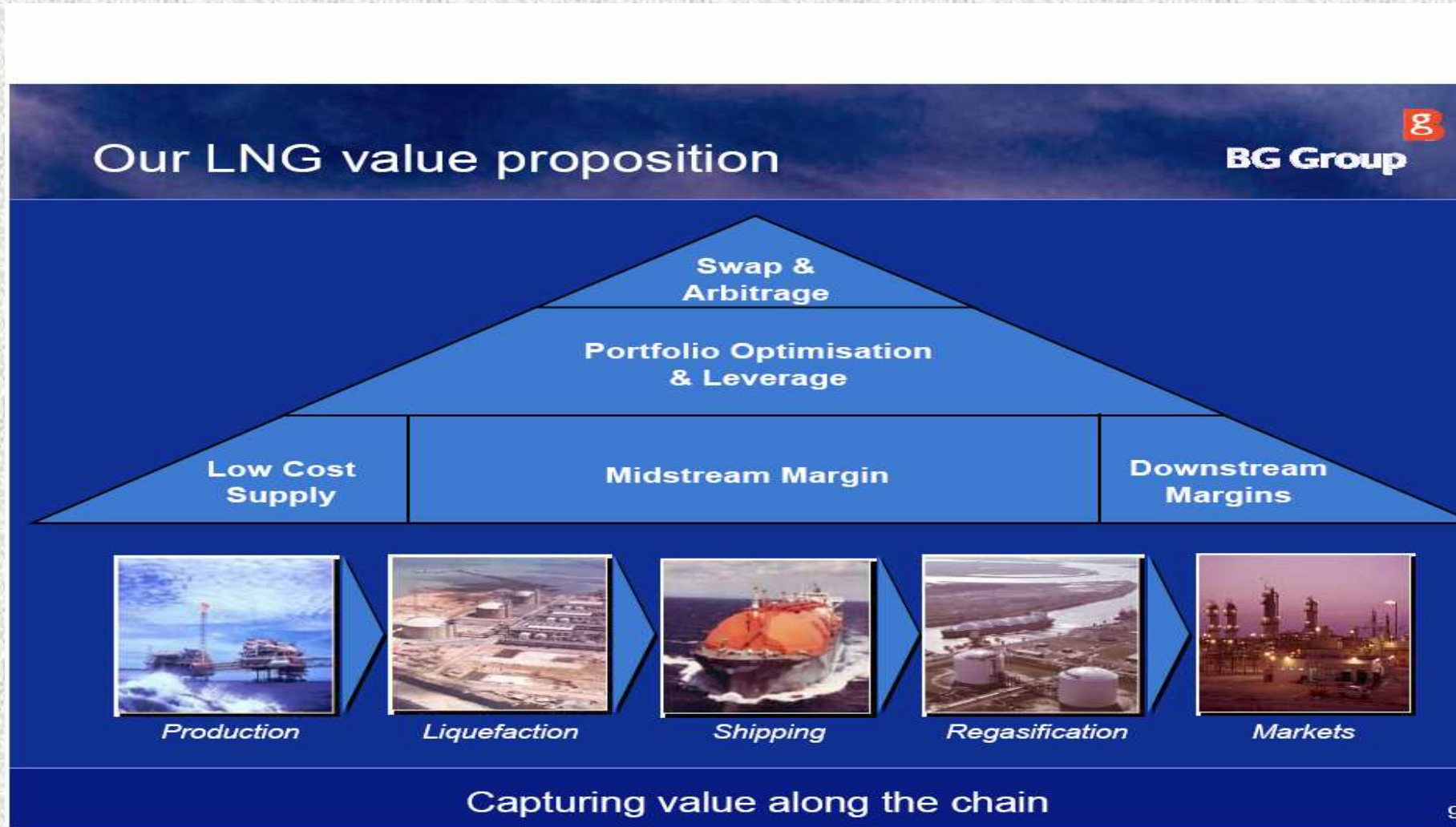
**2. *Security*** (Maritime Terrorism)

In the Ocean Transportation Segment

# LNG Supply Chain

*Shipping* = The Unique Segment

So many Flag States, So many Qualities (No concrete standards)



# Safety

The biggest Challenge:

Shortage of Qualified LNG Mariners

“In order to safely operate the growing LNG fleet, *the demand for competent seafarers must be met without delay* and I believe that it is incumbent upon us all to do our utmost to address proactively the need for appropriately qualified seafarers before any shortage of skills adversely affects the safety, security and efficiency of the sector and the industry in general.”- Mr. T. Mitropoulos, Secretary General IMO at Opening of STW Sub-Committee, Jan., 06

# LNG Mariners - Estimate

\*September, 2004:

|                                   |                      |
|-----------------------------------|----------------------|
| <b>The world total LNG fleet:</b> | <b>174</b>           |
| - Japanese trade:                 | 76                   |
| - Non Japanese trades:            | 98                   |
| -Estimated Mariners:              | <u>5,300 (3,180)</u> |

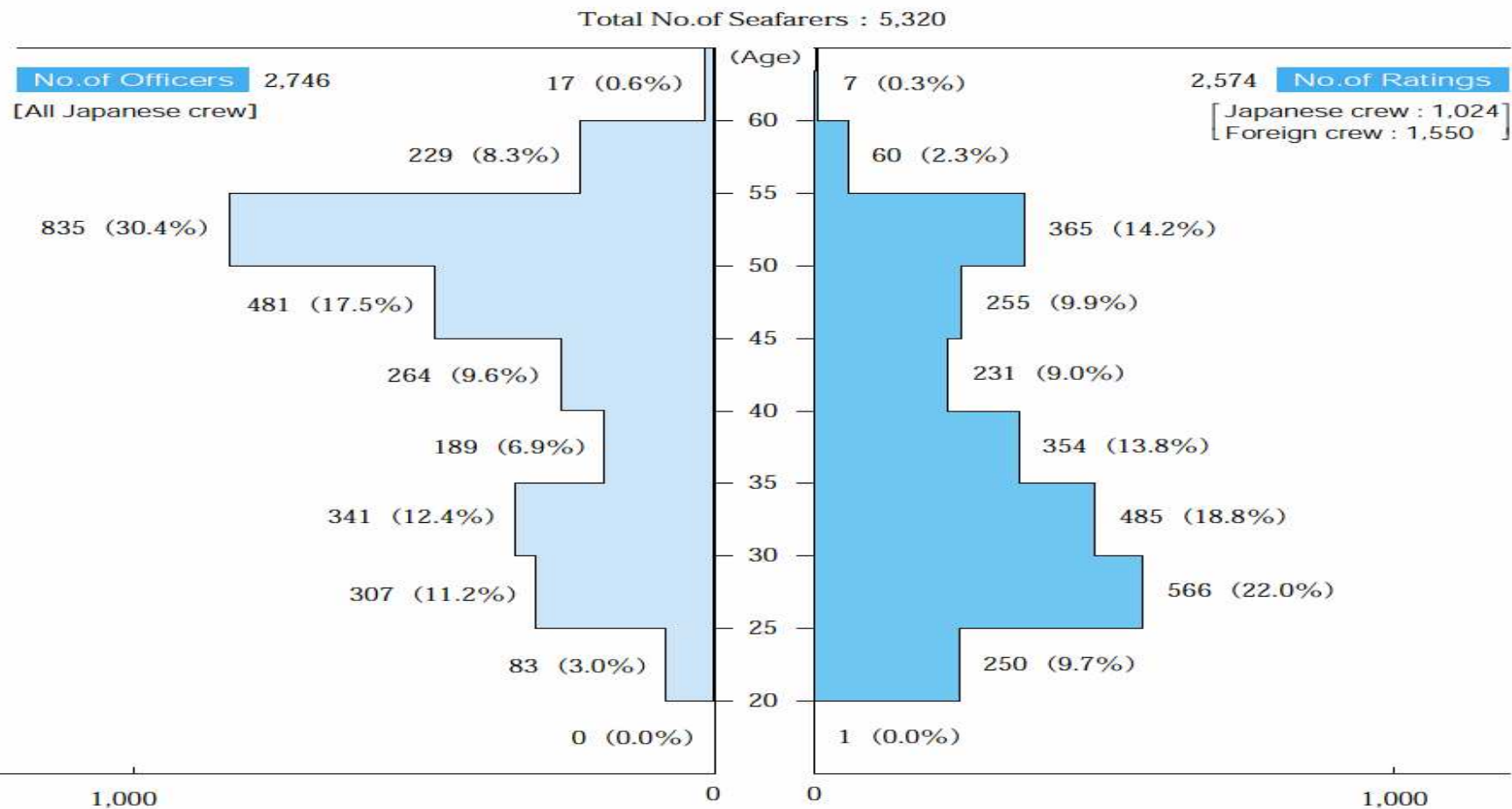
\*End of 2010:

|                                   |                       |
|-----------------------------------|-----------------------|
| <b>The world total LNG fleet:</b> | <b>342</b>            |
| -Estimated Mariners:              | <u>10,100 (6,060)</u> |

[Note] It takes more than 10 years to become senior officers (In blaket)

# An Example – Demography of Japanese Seafarers

- As of October 1, 2002, middle-aged and elderly seafarers occupy a large portion of all seafarers employed by oceangoing shipping companies. Officers over 40 years old account for 66.5% of all officers.



# The Rule of the Shipping Market

1. Responsible party for ship's quality:

## The Flag State

2. No Uniform Quality Standard for Mariners

→ Various quality mariners are serving

3. No Uniform Quality Control Mechanism

4. Empirical Judgment: *Uniform, Fair, Objective, Transparent Q/C mechanism is inevitable* to keep prestigious safety record

World LNG Calendar 2006 - 2010

[Source: LNG Solutions]

| Items                    | Year 2006                                   | Year 2007   | Year 2008   | Year 2009                                 | Year 2010  | Remarks   |
|--------------------------|---|---|---|---|------------|---|
| Total Fleet(year end)    |   |   |   |   |            | *Mar.06: 196 Ships  |
| (a) Number               | 216   | 251   | 305   | 339                                       | 342        | 23,987,238 cbm  |
| (b) Capacity             | 26.819.168                                  | 32.043.768  | 41.779.068  | 47.685.768                                | 48.149.968 |   |
| N/B Deliveries           |   |   |   |   |            | [Total]   |
| (a) Number               | 20  | 35  | 54  | 34  | 3          | 146   |
| (b) Capacity             | 2.831.930                                   | 5.224.600   | 9.735.300   | 5.906.700                                 | 464.200    | 24.162.730  |
| Containment System       |   |   |   |   |            | [Total]   |
| (a) Spherical            | 5   | 3   | 7   | 1   | 0          | 16  |
| (b) TGZ                  | 6   | 19  | 26  | 21  | 2          | 74  |
| (c) GT                   | 6   | 13  | 21  | 12  | 1          | 53  |
| (d) CS1                  | 3   | 0   | 0   | 0   |            | 3   |
| Main Propulsion          |   |   |   |   |            | [Total]   |
| (a) Steam Turbine        | 17  | 30  | 20  | 9   | 1          | 77  |
| (b) DFDE                 | 3   | 1   | 12  | 15  | 2          | 33  |
| (c) SSDF                 | 0   | 4   | 22  | 10  | 0          | 36  |
| <b>IMO</b>               | <b>MSC81(May)</b><br>discussed<br>LNG issue |   | <b>LNG Specific</b> Mandatory Requirements in Chap. V is aimed to be completed                                    |   |            |   |
| <b>Important Matters</b> |   | 1) <b>The first 200K cbm ship</b> appears<br><br>2) <b>SSDR</b> appears<br><br>3) On board<br><br><b>reliquefaction plant</b><br>4) <b>China's first LNG ship</b> will be delivered | 1) <b>The first 260K cbm ship</b> appears<br><br>2) <b>SSDR-Rapid increase</b> , superceding Steam Turbine in N/B | 1) <b>Capacity doubles</b> from March, 06 |            | * <b>DFDE</b> : Dual Fuel Diesel Electric<br><br>* <b>SSDR</b> : Slow Speed Diesel, Relequefaction Plant on board |



# The New Era

1. When: 2007
2. Unprecedented Feature: Two (2) Tiers
  - a) Tier - I : Existing some 200 ships
  - b) Tier – II: New Buildings *after 2007*,  
= 146 ships
    - Technical Innovations
    - No accumulation of know-how and experience

# Mariner Education and Training

Where the capacity is

(Author's Estimate)

Tier – I

Tier - II

Players

The Clubs

○

X

New Entrants

△

X

# Responses of the World Maritime Community

## **On LNG Mariners**

### 1. January, 2006:

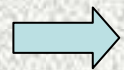
IMO Sub-Committee took note of SIGTTO Information (on required Competence reflecting the best practice of the current industry)

### 2. May, 2006:

IMO Maritime Safety Committee (MSC) decided to establish LNG specific standard by 2008.  
(Expected to take effect as late as 2010~2012)

# Security

1. Overview: Risk is increasing
2. Target: Maximum socio-economic damage
3. They are: Professionals
4. LNG ships: Risk should be high



IMO decided to include some of the ISPS Code contents in STCW Convention and Code

# Maritime Terrorism: Case Study Selection

[By Assoc. Prof. Dr. D. Nincic, California Maritime Academy]

- Hijacking and hostage taking
- Attacks on ships
- Use of ship as a “vector”
- Use of ship as weapon
  - LNG example
- Use of ship to close chokepoints/ports

# Basic Modeling within a Geographical/Spatial Context

- LNG Safety =  $f$  (Ship Safety/Security + Port Safety/Security + Territorial Water Safety/Security)
- Geographical/Spatial Dimension:
  - Trading partner security is also a component of US LNG safety/security

# The Maritime Policy Trends

1. **U.S.:** U.S. Flag LNG Tankers preference
  - Section 304 of Coast Guard and Maritime Transportation Act 2006
2. **Japan:** A new law to allow Japanese flags for foreign-owned ships
3. **Korea:** Inevitable Fleet Program started
  - January 1, 2006 (which includes LNG ships)
4. **China:** Own flag for their domestically built LNG ships

# U.S. Legislation, 2006

## **SEC. 304. LNG TANKERS.**

*(a) PROGRAM.—The Secretary of Transportation shall develop and implement a program to promote the transportation of liquefied natural gas to the United States on United States flag vessels.*

*(b) AMENDMENT TO DEEPWATER PORT ACT.—Section 4 of the Deepwater Port Act of 1974 (33 U.S.C. 1503) is amended by adding at the end the following:*

*“(i) To promote the security of the United States, the Secretary shall give top priority to the processing of a license under this Act for liquefied natural gas facilities that will be supplied with liquefied natural gas by United States flag vessels.”.*



# What Can and Should We Do ?

*To do our utmost due diligence*, to keep the prestigious safety record of the LNG shipping in the world LNG supply chain.

These are:

1. Global Quality Control Mechanism
2. Incident Database (Like aviation industry, mandatory reporting requirements to be considered)
3. Principle of Transparency

# Conclusion [II]

## The Blind Spot

An Effective “Quality Control Mechanism” for LNG Mariners is FATALLY MISSING

1. A “Voluntary International Examination of Competence” should be established.
2. This is through international collaboration among direct stakeholders such as:
  - a) Administrations (LNG importing/exporting countries)
  - b) Industry body (IGU, SIGTTO)
  - c) Academia (IAMU)
  - d) Professional organization (Class societies)
  - e) International organization (IMO)
3. **The Biggest Enemy = Time**

**Thank you very much**

**[www.iamu-edu.org](http://www.iamu-edu.org)**