Preparation and cooperation between industries and Administrations toward 2020

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JAPAN
Outline

1. Importance of 2020 Sulphur limit
2. Preparations (in case of Japan)
3. Perspective toward 2020 and future
1. Importance of 2020 Sulphur Limit
Amendment to MARPOL Annex VI was adopted by consensus in 2008

“The Secretary-General stated that this was a monumental decision for the Committee and IMO as a new milestone in the history of the Organization had been reached through the unanimous adoption of the revised MARPOL Annex VI …”

Regulation 14 applies to all ships, including ships solely engaged in non-international voyage (domestic ships).
Reduction in annual PM$_{2.5}$ concentrations (in micrograms per cubic meter) due to the implementation of the IMO’s global fuel sulphur standard in 2020

Expected health benefit due to the IMO 2020 global sulphur limit are:

- **Premature adult death avoidance**: 137,000 persons/year
- **Childhood asthma avoidance**: 7,600,000 persons/year

Avoided mortality (cardiovascular disease and lung cancer) distribution from reduced ship PM$_{2.5}$ emissions due to the IMO’s global fuel sulphur standard in 2020.

Note: LC: lung cancer; CV: cardiovascular disease

Source: Sofiev et al., “Cleaner fuels for ships provide public health benefits with climate tradeoffs”, *Nature Communications*, 2018.
KEY points for successful implementation

SOx & PM reductions are **globally common challenge**

✓ Unified collective actions

✓ Cooperation between stakeholders
  (maritime industry, oil suppliers, Administrations etc.)

✓ Utilization of alternative equivalent means, e.g. EGCS
  (plays an important role for the balance of short/mid-term supply & demand of HFO market)

✓ Understanding and cost sharing by the public
2. Preparations (in case of Japan)
Shipping industry of Japan

Fuel Oil Users

International Ocean-going ships

- Owners: 700
- Operators: 190
- Ships: 2,600

Domestic Coastal ships

- Owners: 1,500
- Operators: 2,500
- Ships: 7,400

Engine and Equipment manufactures and Shipbuilders
A large number of refineries are producing marine fuel oil in Japan.
Concerns and interests of stakeholders

**Suppliers**
- ✓ Easy to produce  
  (Low cost, less residue)
- ✓ Sufficient & constant supply
- ✓ High price

**Users**
- ✓ Safe operation  
  (High quality)
- ✓ Minimum investment  
  (no new equipment and conversion)
- ✓ Low price

Stakeholders should understand **concerns and interests of each other**
Consultation on specification of LSHFO in Japan

A Round Table with relevant industries and Ministries was established
  - to investigate ship equipment's ability to handle and burn fuels
  - to consult and find out acceptable LS-HFO specifications

Reached general agreement on the specification

Kinematic Viscosity at 50 °C: Min 20 mm²/s (unless agreed otherwise)
Compatibility of fuels

- Compatibility tests were carried out in cooperation between Japanese oil refineries and the Government.
- No mixture showed compatibility problem.

Fuel oils
- LS-HFO: 8 samples,  HS-HFO: 7 samples
- Supplied by Cosmo Oil, Fuji Oil, Idemitsu Kosan, JXTG Nippon Oil & Energy, Showa Shell Oil

Outline of the test
- ASTM D4740
- Mix ratio:
  - \( \frac{2}{8} \) : \( \frac{5}{5} \) : \( \frac{8}{2} \)
- Combinations:
  - HS-HFO × LS-HFO: 168 patterns
  - LS-HFO × LS-HFO: 84 patterns
  - Total 252 patterns

Result
- All 252 combinations showed good compatibility.
Trial of LS-HFO on board

- 12 ships (Tanker, Bulker, RoRo, RoPax, Passenger, etc.)
- 3 LS-HFOs provided by refineries
- Refueled LSHFO on top of reaming HSHFO without tank cleaning

Result and Outcome

- HSHFO and LSHFO mixed uniformly in FO tank
- No unusual sludge
- Normal combustion, safe operation
- Established an **Experts’ Group** including engineers from shipping, shipbuilding, marine engine and equipment manufactures, class and research institution

- Compiled technical information and outcome of researches, and **developed a guidance** for safe usage of LS-HFO.

**Outline of the guidance**

Chapter 1  2020 Sulphur Cap
Chapter 2  Difference between HS-HFO and LS-HFO
Chapter 3  Recommended preparations for fuel switch
Chapter 4  Cautions for bunkering and fuel switch
Appendix  Test results of compatibility, trial on board etc.

Note: Original in Japanese
Utilization of alternative equivalent means

Alternative equivalent means, e.g. EGCS, would play an important role for the balance of short/mid-term supply & demand of HFO market

To support decisions of the industry, MLIT in cooperation with associated Organs

- Examined discharge standards of IMO EGCS guidelines (assessed short and long term environmental risk based on the method used for BWMS)

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<th>The risk on marine organisms</th>
<th>The impact on the seawater quality</th>
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<td><img src="image1" alt="Marine Organisms" /></td>
<td><img src="image2" alt="Seawater Quality Impact" /></td>
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- Conducted **Feasibility Study of retrofitting EGCS to domestic coastal ships**

- Silencer
- Scrubber
- Pipeline
- Seawater pump

Most enclosed seas in Japan
Public awareness of 2020 sulphur limit

- Fuel cost is very large for the shipping industry. It itself cannot bear the increased cost for the sulphur reduction.
- **Those environmental cost should be shared by the whole society.**
  - MLIT developed the Guidelines on fuel surcharge for domestic coastal shipping industry
  - MLIT held Seminars/Symposiums/Roundtables more than 30 times in 2018-2019 to raise awareness of maritime industry as well as shippers and the public.

Cost of passenger ship (middle/Long distance)
(Average of 2013 ～ 2017 fiscal year in Japan)
Circumstances in Japan

✓ Basic Specification has been agreed between Oil refineries and shipping industry.

✓ Safe operation was confirmed through land based and on board testing.

✓ Supply of the compliant fuels and fuel switch have been starting since the beginning of October in 2009

Japanese oil and shipping industries are ready for 2020 Sulphur limit
3. Perspective toward 2020 and future
Perspective toward 2020 and future

Preparations

- Many Instruments have been developed by IMO, Gov, Class, NGO, industry etc.
- Implementation/contingency plans have been developed or are under finalization by ships/companies as well as the Administrations
- Fuel switches are starting

End of 2019 - Smooth implementation

2020 & Future

Enforcement

- Strengthen control measures to eliminate non-compliance
- Secure level playing field

Promotion of cleaner energy

- Global Information sharing between Administrations & Industry (Fuel availability and quality etc.)
- Continue dialog and cooperation between stakeholders to improve fuel quality and availability
Thank you.