

For discussion on
24 June 2013

Legislative Council Panel on Economic Development
Incorporating in local legislation the latest standards
of the International Maritime Organization on vessel emissions

PURPOSE

This paper briefs Members on our proposal to amend the Merchant Shipping (Prevention of Air Pollution) Regulation (Cap. 413M) (“the Regulation”) to incorporate the latest standards of the International Maritime Organization (“IMO”) on vessel emissions.

BACKGROUND

2. The International Convention of the Prevention of Pollution from Ships (“MARPOL”) is adopted by the IMO for the prevention of pollution to the marine environment from ships. Annex VI to the MARPOL is related to the prevention of air pollution from ships.

3. The Regulation was enacted in 2007 to implement the requirements of Annex VI in Hong Kong. The Regulation specifies the requirement on the control of emissions of ozone depleting substances (“ODS”), nitrogen oxides (“NOx”), sulphur oxides (“SOx”) and volatile organic compounds (“VOCs”) from ships. To ensure compliance with the controls imposed, the Regulation requires that surveys and inspections of ships be conducted annually or at other intervals as specified in the Regulation as well as issue of International Air Pollution Prevention Certificate for ships of 400 gross tonnage and above. It also specifies the quality of fuel oil used and regulates shipboard incineration.

Application of the Regulation

4. As specified under the Regulation, in broad terms, the IMO standards are applicable to both ocean-going vessels (“OGVs”) and local vessels except for NOx emission, which Annex VI allows for flexibility for a signatory party (the “Party”) to determine whether to establish alternative emission-control measures for ships solely engaged in voyages within their own waters (in the case of Hong Kong, such ships refer to locally licensed vessels¹ and river trade vessels²).

¹ As at end 2012, there were a total of 16 282 locally licensed vessels in Hong Kong.

Where Annex VI requirements apply to OGVs flying the flags of a Party, the Party needs to ensure the ships are in compliance with such requirements. The Parties are also obligated to check compliance of other OGVs navigating in their waters. The Hong Kong Port is frequently visited by OGVs and saw a total of 30 703 arrivals of OGVs in 2012.

PROPOSALS

Amendments to the Regulation

5. Since Annex VI came into force internationally in 2005, the IMO has continued to review and amend the standards in Annex VI with a view to improving the control of vessel emissions and effecting other technical amendments. As an associate member of the IMO and to maintain our status as an international maritime centre, we need to keep our local legislation aligned with the latest standards in Annex VI. To this end, we propose to amend the Regulation as outlined in the following paragraphs.

SO_x

6. Sections 29 and 30 of the Regulation control the sulphur content of the fuel oil used on board all ships. To align with the latest requirements as stipulated in Annex VI, we propose to amend the sulphur content level from the existing 4.5% m/m³ to 3.5% m/m.

NO_x

7. Section 27 of the Regulation controls the level of NO_x emissions from marine diesel engines with a power output of over 130 kW, for example, at a NO_x emission level of 17 g/kWh for vessels with rated engine speed at below 130 rpm (the emission level is known as Tier I under Annex VI). We propose to amend the Regulation to introduce the Tier II level (which is more stringent than Tier I) for newly constructed ships, for example, at a NO_x emission level of 14.4 g/kWh for vessels with rated engine speed at below 130 rpm. The limit values for Tier I and Tier II levels applicable for different marine diesel engines are set out at **Annex I**.

ODS

8. Sections 25 and 26 of the Regulation prohibit the deliberate emission of

² In 2012, the Hong Kong Port saw a total of 160 156 arrivals of river trade vessels.

³ 4.5% m/m means that the substance is 4.5% of the mass of the total solution.

ODS from ships which include emissions in the course of maintaining, servicing, repairing or disposing of equipment. The Regulation further requires that when removing ODS or equipments containing ODS from ships, the substances or equipments must be delivered to appropriate reception facilities. We propose to amend the Regulation by requiring ships of 400 gross tonnage and above engaged in international voyages to maintain a list of ODS-containing equipment, and where they have rechargeable systems that contain ODS, to maintain an ODS Record Book to record, among other things, the mass of ODS discharged, if any.

VOCs

9. Section 28 of the Regulation requires that a tanker registered in Hong Kong must have onboard a system for the collection of VOCs and must use such system during the loading of relevant cargoes in a designated port or terminal which is subject to the VOC requirements of Annex VI⁴. The system is to be approved by the Director of Marine (“DM”) according to the standards adopted by IMO. We propose to amend the Regulation to require all tankers that carry crude oil and are registered in Hong Kong to have on board and implement a VOC Management Plan which is to be approved by DM in accordance with the guidelines issued by IMO. The VOC Management Plan should set out ship-specific procedures for minimizing VOC emissions, and identify persons responsible for implementing the plan. The above requirements will apply to tankers that are registered under the Hong Kong Shipping Register, totaling 304 as at June 2013, when carrying crude oil.

Shipboard incineration

10. Sections 31 and 32 of the Regulation require that incineration onboard ships must be undertaken in shipboard facilities designed for that purpose, and prohibit the incineration of certain specified materials⁵. In accordance with the latest requirements under Annex VI, we propose to amend the Regulation to expand the scope of such materials to prohibit also the incineration of sewage sludge and sludge oil not generated onboard the ship, and the residues from exhaust gas cleaning system.

Energy efficiency for Ships

11. To control the emission of greenhouse gas (mainly carbon dioxide),

⁴ VOC will be emitted mainly during loading operation (i.e. terminal to ship). For Hong Kong, there is no large-scale loading operation from our oil terminal to tankers because Hong Kong does not export crude oil, petroleum products and chemicals to other countries. There is therefore no requirement on the control of VOC emission from ships in Hong Kong waters. This arrangement is allowed under Annex VI.

⁵ The specified materials are set out in Regulation 16 of Annex VI, and include certain residues of cargoes, polychlorinated biphenyls (PCBs), certain garbage containing more than traces of heavy metals, and refined petroleum products containing halogen compounds.

IMO has added a new chapter to Annex VI regulating the energy efficiency of OGVs of 400 gross tonnage and above. To adopt such requirements, we propose to amend the Regulation to specify the minimum energy efficiency level for different types of OGVs according to their dates of construction or major conversion as per **Annex II**. The revised Regulation will also require each OGV to keep on board a Ship Energy Efficiency Management Plan (“SEEMP”). The SEEMP on board OGVs registered in Hong Kong must be prepared according to the guidelines issued by IMO and approved by the Director of Marine. The SEEMP adopts indicators to measure the fuel efficiency of a ship in operation and to gauge the effect of any changes in operation, with a view to urging ship owners / operators to consider new technologies and practices when seeking to optimize the performance of a ship.

12. As Annex VI is frequently updated in its technical standards and specifications, the direct reference approach has already been adopted in certain technical provisions in the existing Regulation⁶. We will continue to seek to adopt this approach in the relevant provisions where appropriate in consultation with the Department of Justice.

Compliance by vessels with the requirements of the latest Annex VI

For OGVs

13. Pending amendments to the local legislation, the MD has promulgated guidelines through the Merchant Shipping Notices to facilitate compliance by OGVs and vessels registered under the Hong Kong Shipping Register and would conduct inspections on such ships according to the latest standards of Annex VI. In 2009, 2010, 2011 and 2012, MD conducted 776, 820, 854 and 869 port state control inspections respectively on OGVs in Hong Kong waters, and no non-compliance cases were identified. In other words, on the basis of inspections done so far, it is observed that the requirements set out in paragraphs 6 to 11 above are already being generally complied with by OGVs navigating in Hong Kong waters.

For other vessels

14. The requirements of the existing Regulation are enforced on local vessels through initial and annual surveys. As regards the requirements in the latest Annex VI, the SO_x emission standard has in fact been practised in Hong

⁶ Under the direct reference approach, the statutory provisions implementing certain requirements in an international convention will refer directly to the relevant provisions in such international convention containing the requirements in question. For examples of adoption of this approach in the Regulation, see sections 29 and 30.

Kong as the local vessels are using fuel oil with sulphur content lower than the 3.5% m/m level. For NO_x standards, DM has established Tier I level as the alternative control measures for local vessels. The Administration has been actively engaging in discussions with the Guangdong side to with a view to exploring the introduction of Tier II level to river trade vessels. For ODS, the importation of halons and CFCs was banned in 1994 and 1996 respectively. In the absence of halons and CFCs in Hong Kong to replenish the equipment working with such substances, no such equipment installed could still be in use today on locally licensed vessels. River trade vessels should also follow the requirements of Annex VI on the use of these substances. For shipboard incineration, locally licensed vessels do not have incinerators installed on board. River trade vessels do not normally have incinerators installed on board due to their short voyages and that their waste is readily disposable ashore. Even if they have shipboard incinerators, such incinerators must be of the type approved by the relevant Mainland authorities according to the requirements of Annex VI.

Penalty level

15. All offences under the Regulation are liable to a fine at level 3 (i.e. \$10,000) on summary conviction; and a fine at level 6 (\$100,000) on conviction upon indictment. We propose maintaining the same penalty levels for non-compliance upon amendments to the requirements.

CONSULTATION

16. The Shipping Consultative Committee, Local Vessel Advisory Committee and High Speed Craft Consultative Committee, which comprise stakeholders in the shipping industry, have been consulted and endorsed the proposal to amend the Regulation for the purpose of implementing the revised Annex VI.

ADVICE SOUGHT

17. Members are invited to comment on the above proposals. Subject to Members' support, we aim at introducing the relevant amendment regulation into LegCo in the next legislative session.

**Transport and Housing Bureau
June 2013**

Technical Calculation for Control on NO_x Emission

Tier	Ship Construction date (on or after)	Total weighted cycle emission limit (g/kWh) n = rated engine speed (rpm)		
		n < 130	130 ≤ n < 2000	n ≥ 2000
I	1 January 2000	17.0	$45 \times n^{-0.2}$ e.g. 720 rpm – 12.1	9.8
II	1 January 2011	14.4	$44 \times n^{-0.23}$ e.g. 720 rpm – 9.7	7.7

CO2 Reduction Level

Ship Type	Size (dead weight ton)	Different reduction factors (%) ^{7 8} according to ship construction date			
		2013 – 14	2015 – 19	2020 - 24	2025 onwards
Bulk carrier	20 000 +	0	10	20	30
	10 000 – 20 000	N/A	0 - 10	0 - 20	0 - 30
Gas carrier	10 000 +	0	10	20	30
	2 000 – 10 000	N/A	0 - 10	0 - 20	0 - 30
Tanker	20 000 +	0	10	20	30
	4 000 – 20 000	N/A	0 - 10	0 - 20	0 - 30
Container ship	15 000 +	0	10	20	30
	10 000 – 15 000	N/A	0 - 10	0 - 20	0 - 30
General cargo ships	15 000 +	0	10	15	30
	3 000 – 15 000	N/A	0 - 10	0 - 15	0 - 30
Refrigerated cargo carrier	5 000 +	0	10	15	30
	3 000 – 5 000	N/A	0 - 10	0 - 15	0 - 30
Combination carrier	20 000 +	0	10	20	30
	4 000 – 20 000	N/A	0 - 10	0 - 20	0 - 30

⁷ The reduction factors and a reference line representing the average efficiency for ships built between 2000 and 2010 will be used to determine the required EEDI.

⁸ For reduction factor expressed in “ – ”, it is to be linearly interpolated between the two values dependent upon vessel size. The lower value of the reduction factor is to be applied to the smaller ship size.