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Panel on Environmental Affairs

Meeting on 25 March 2013

**Background brief on "Upgrading the quality of local marine light diesel"
prepared by the Legislative Council Secretariat**

Purpose

This paper provides background information on the proposal of imposing a statutory sulphur limit of 0.05% on locally supplied marine light diesel, and gives a brief account of the views and concerns expressed by Members on the subject.

Background

2. Air pollution is one of the major problems in Hong Kong. According to the International Maritime Organisation ("IMO"), air pollution from marine vessels is substantial and growing, causing serious and increasing public health and environmental impacts. In 2011, emissions from marine vessels accounted for 54% of sulphur dioxide ("SO₂"), 33% of nitrogen oxides ("NO_x") and 39% of respirable suspended particulates of the total emissions¹ in Hong Kong. Owing to increased maritime activities in Hong Kong and the Pearl River Delta ("PRD") region, marine emissions have substantially increased and become the largest local air pollution sources in the territory.

3. Generally, there are three types of vessels navigating in Hong Kong waters, namely –

(a) ocean-going vessels ("OGVs");

(b) river-trade vessels (mainly registered in the Mainland); and

¹ 2011 emission data are preliminary and subject to revision.

(c) local vessels (such as ferries, pleasure boats and fishing boats).

4. According to the Summary Statistics on Port Traffic of Hong Kong published in February 2013, there were around 30 000 OGV and 160 000 river-trade vessel arrivals in Hong Kong in 2012. As of October 2012, about 15 400 vessels are licensed to operate locally and/or in the PRD region².

Upgrading the quality of local marine light diesel

5. As stated in the 2013 Policy Address, the Administration is working on a proposal to impose a statutory sulphur limit of 0.05% on locally supplied marine light diesel, which now has a nominal sulphur limit of 0.5%. At present, local and river-trade vessels are normally fuelled by light diesel with a sulphur limit of 0.5%. According to the test results of the oil companies, the sulphur content of light diesel oil delivered to Hong Kong ranged from 0.15% to 0.49% in the period from September 2009 to September 2011.

Trial use of ultra-low sulphur diesel for local ferries

6. In October 2007, the Administration announced that a trial scheme would be conducted to explore the technical feasibility of using ultra-low sulphur diesel ("ULSD") which had a sulphur content not exceeding 0.005% on local ferries. The trial scheme was completed in end July 2010. Whilst the trial findings revealed that the use of ULSD to local ferries was technically feasible, the fuel cost would increase by 21% due to additional handling costs for supplying ULSD for this specific segment in the local marine sector. The executive summary of the trial report is in **Appendix I** for members' reference.

Trial use of 0.1% sulphur diesel for local vessels

7. In the light of the trial findings and having regard to the small market of Hong Kong, the Administration considered that any upgrading of the standard of marine fuel sold in Hong Kong should be pursued to ensure no additional handling costs would be incurred from providing different types of marine fuels to different local vessels and to maximize the environmental benefits. Given that local vessels in many overseas countries such as those in the European Union were using 0.1% sulphur diesel, switching to 0.1% sulphur diesel, which had a higher sulphur content than ULSD, should pose no technical problem to the engines of local vessels.

8. In December 2011, the Administration revised the proposal to cap the

² Preliminary figures provided by the Marine Department.

sulphur content of marine light diesel at 0.1% and stated that it would conduct a small scale demonstration trial on the use of 0.1% sulphur diesel for local vessel operators.

Trial use of 0.05% sulphur diesel for local vessels

9. In June 2012, after consulting the Working Group on Upgrading the Quality of Marine Light Diesel, the Environmental Protection Department ("EPD") decided to conduct a trial on local vessels using diesel with a sulphur limit of 0.05% with a view to lowering the sulphur content of marine fuel. A local university was commissioned to conduct the trial to help local-vessel operators get first-hand experience of using diesel with a sulphur limit of 0.05%. The trial scheme was targeted for completion in the first quarter of 2013.

10. The Administration informed the Subcommittee on Issues Relating to Air, Noise and Light Pollution at its meeting on 29 January 2013 that it planned to reduce the sulphur content of locally supplied marine light diesel from the existing nominal value of 0.5% to 0.05% and was conducting a trial with the local marine sector on the technical feasibility. Subject to the satisfactory outcomes of the trial which was due to complete in the first quarter of 2013, the Administration would draw up a legislative proposal and timetable later in the year.

Deliberations by Members

Panel on Environmental Affairs

11. The Panel on Environmental Affairs ("the Panel") was briefed on the progress of the trial scheme to explore the feasibility of using ULSD by local ferries (paragraph 6 refers) at the meetings on 22 October 2007 and 16 October 2009 respectively. The Panel was further consulted on the proposal put forth by the Administration to cap the sulphur content of marine light diesel at 0.1% (paragraphs 7 and 8 refer) at its meeting on 21 December 2011.

12. Given the many different kinds of vessels and ships plying within Hong Kong waters, some members questioned the feasibility of the proposal of capping the sulphur content of marine light diesel at 0.1%. They pointed out that the proposal was very stringent since the allowable sulphur content of marine diesel in many overseas countries was between 0.1% and 0.5%.

13. As regards the effectiveness of emission reduction devices in reducing emissions and how these compared with the switch to 0.1% sulphur diesel, members noted that the Administration had an open mind on retrofitting emission reduction devices if they were proven to be effective in improving the

emission performance of vessels. It was also noted that a tertiary institution was developing scrubbers to reduce SO₂ emission from ferries, and local ferry operators could seek funding from the Pilot Green Transport Fund to test such devices on their ferries.

14. Noting out that the fishing industry had been facing much difficulty in meeting the new requirements on emission performance of fishing vessels, some members considered that there was a need for the Administration to provide assistance to the fishing trades. Incentives, such as concessions for cleaner fuels and subsidies for replacement of polluting vessels with cleaner models, should be provided to local fishermen.

15. As regards the time frame for upgrading the standard for local marine fuel supply, members noted that the Administration agreed to the need to expedite the demonstrational trial and the consultation with the trades on the time frame for upgrading the standard for local marine fuel supply to enable early improvements to air quality. They further noted that the cost difference between the two fuels (i.e. 0.1% and 0.5% sulphur diesel) was insignificant, and hence the proposal for capping the sulphur content of marine light diesel at 0.1% should not bring about any major changes to the retail price of the diesel.

Public Accounts Committee

16. The subject of "Implementation of air-quality improvement measures" was studied by the Director of Audit in his Report No. 59 ("the Audit Report") and examined by the Public Accounts Committee ("PAC"). The Audit Commission ("Audit") points out that the progress of requiring local and river-trade vessels to use ULSD has been slow while Audit's research has revealed that some overseas countries have already adopted more stringent standards for local vessels to use diesel with a sulphur limit of 0.001% to 0.0015%, and the Mainland will also adopt from July 2013 a standard with a sulphur limit of 0.035% for diesel used by local vessels.

17. Audit comments that comparing with the current 0.5% sulphur limit and the proposed 0.05% sulphur limit for diesel used by local vessels, the diesel standards of Hong Kong are falling far behind those of the Mainland and overseas countries. The Audit Report has recommended that the Administration needs to explore measures to further reduce the sulphur limit of fuel used by local and river-trade vessels in Hong Kong.

18. In examining the Audit Report, PAC members enquired why Hong Kong had no plan to require local vessels to use ULSD which had a sulphur content not exceeding 0.005%, despite the fact that it was technically feasible to do so according to the findings of the trial scheme conducted by EPD in October 2007.

19. The Administration advised that whilst the trial scheme demonstrated that the use of ULSD by local ferries was technically feasible, the fuel cost would increase by more than 20% due to additional handling costs for supplying ULSD for this specific segment in the local marine sector. To avoid the additional handling costs and maximize the air quality improvement benefit, it was considered that the use of ULSD should best be applied to all local vessels instead of ferries alone. However, as engines of many local vessels were old home-made ones, the local marine trade and the Marine Department had expressed concerns about the impacts of the use of USLD on the operation and safety of local vessels. Being a fuel with closer resemblance to the existing 0.5% sulphur-content diesel used by local vessels but with much lower emission levels, the 0.05% sulphur diesel would better address these operational and safety concerns. The 0.05% sulphur-content diesel could reduce SO₂ emission by 90% from the current levels.

20. PAC members also enquired whether EPD had any plan to lower the sulphur content of the diesel used by local and river-trade vessels plying in Hong Kong waters to 0.035% so as to dovetail with the standard to be adopted by the Mainland for its local vessels from July 2013. The Administration replied in the negative for the following reasons –

- (a) diesel fuel with 0.05% sulphur content, but not 0.035%, was a common grade of diesel for fuel suppliers in the East Asian markets. To ensure satisfactory fuel supply to the marine industry of Hong Kong, there was a need to make reference to the norm of major fuel suppliers to local vessels; and
- (b) due to the small difference in the sulphur content between the two diesel fuels and that fuel suppliers would also maintain a sufficient margin in complying with sulphur limit, it was expected that the sulphur content of fuel to be supplied in Hong Kong after the tightening would be close to that adopted in the Mainland.

21. In PAC Report No. 59, PAC urged the Environment Bureau and EPD to set expeditiously a new sulphur limit lower than the existing 0.5% for local as well as river-trade vessels by making reference to fuel sulphur limits set in the Mainland and overseas countries.

Council questions

22. Hon Paul TSE and Hon James TO raised questions relating to local marine diesel at the Council meetings on 3 November 2010 and 14 December 2011. Details of the Council questions are hyperlinked in **Appendix II** for ease of reference.

Latest development

23. The Administration will consult the Panel at the forthcoming meeting on 25 March 2013 on its plan to impose a statutory sulphur limit of 0.05% on locally supplied marine light diesel to reduce air pollution from local vessels and river-trade vessels refilled in Hong Kong.

Relevant papers

24. A list of relevant papers is set out in **Appendix II**.

Council Business Division 1
Legislative Council Secretariat
21 March 2013

Trial of Local Ferries Using Ultra Low Sulphur Diesel Executive Summary

A trial was launched in end-August 2009 to ascertain the technical feasibility of local ferries using ultra-low sulphur diesel (ULSD) and to collect essential operation data in relation to the fuel switch. The trial was completed in end-July 2010. Its findings would help the Government map out the way forward to reduce the emissions of local ferries.

Four ferry operators contributed altogether six non-kaito ferries to the trial. The participating ferries contained a mix of different engine models, engine capacity, vessel features and service modes. For some engine models of the participating ferries, their engine makers have advised that they are ULSD compatible.

The trial findings indicated that in general, there was no remarkable change in fuel consumption, maintenance requirement and engine power output. Star Ferry took exception to the generality for the reason of the unique engine model of its participating ferry – low-speed 2-stroke engines. Exhaust emission and odour were slightly reduced. The participating ferries had to pay on average an additional cost of \$0.93 per litre after switching from marine light diesel (MLD, with a maximum sulphur content of 0.5%) to ULSD (with a maximum sulphur content of 0.005%).

It is concluded that from a technical point of view, the participating ferries could generally replace MLD with ULSD for powering their engines. Star Ferry considers the trial findings inconclusive for its participating ferry due to the unique engine model of its participating ferry. The trial has also demonstrated that if ULSD is applied only to a small sector of the local vessels, a logistic overhead cost would be incurred. This would increase the fuel price differential of fuel switch, thereby raising the operating cost and imposing pressure on fare (for the case of ferry services).

Appendix II

List of relevant papers

Council/ Committee	Date of meeting	Paper
Panel on Environmental Affairs	22 October 2007	<p>Administration's paper on "2007-2008 Policy Agenda - Policy Initiatives of the Environment Bureau" (LC Paper No. CB(1)34/07-08(01)) http://www.legco.gov.hk/yr07-08/english/panels/ea/papers/ea1022cb1-34-1-e.pdf</p> <p>Minutes of meeting (LC Paper No. CB(1) 282/07-08) http://www.legco.gov.hk/yr07-08/english/panels/ea/minutes/ea071022.pdf</p>
Panel on Environmental Affairs	16 October 2009	<p>Administration's paper on "2009-2010 Policy Address and Policy Agenda - Policy Initiatives of the Environment Bureau" (LC Paper No. CB(1)28/09-10(01)) http://www.legco.gov.hk/yr09-10/english/panels/ea/papers/ea1016cb1-28-1-e.pdf</p> <p>Minutes of meeting (LC Paper No. CB(1)390/09-10) http://www.legco.gov.hk/yr09-10/english/panels/ea/minutes/ea20091016.pdf</p>
Panel on Environmental Affairs	21 December 2011	<p>Administration's paper on "Controlling Emissions from Vessels" (LC Paper No. CB(1)625/11-12(03)) http://www.legco.gov.hk/yr11-12/english/panels/ea/papers/ea1221cb1-625-3-e.pdf</p> <p>Minutes of meeting (LC Paper No. CB(1)966/11-12) http://www.legco.gov.hk/yr11-12/english/panels/ea/minutes/ea20111221.pdf</p>
Audit Commission	Tabled in the Legislative Council on 14 November 2012	<p>Director of Audit's Report No. 59</p> <p>Chapter 2 – Implementation of air-quality improvement measures http://www.aud.gov.hk/pdf_e/e59ch02.pdf</p>

Council/ Committee	Date of meeting	Paper
Panel on Environmental Affairs	28 January 2013	Administration's paper on "2013 Policy Address – Policy Initiatives of Environment Bureau: Environmental protection" (LC Paper No. CB(1)431/12-13(02)) http://www.legco.gov.hk/yr12-13/english/panels/ea/papers/ea0128cb1-431-2-e.pdf
Subcommittee on Issues Relating to Air, Noise and Light Pollution	29 January 2013	Administration's on "Current legislation and administrative measures on the control of air pollution and the associated public expenditure" (LC Paper No. CB(1)474/12-13(01)) http://www.legco.gov.hk/yr12-13/english/panels/ea/ea_anlp/papers/ea_anlp0129cb1-474-1-e.pdf
Public Accounts Committee	Tabled in the Legislative Council on 6 February 2013	Report of the Public Accounts Committee on the Reports of the Director of Audit on the Accounts of the Government of the Hong Kong Special Administrative Region for the year ended 31 March 2012 and the Results of Value for Money Audits (Report No. 59) http://www.legco.gov.hk/yr12-13/english/pac/reports/59/59_rpt.pdf

Hyperlinks to relevant Council Questions:

Date	Council Question
14 December 2011	Council question raised by Hon James TO http://www.info.gov.hk/gia/general/201112/14/P201112140161.htm
3 November 2010	Council question raised by Hon Paul TSE http://www.info.gov.hk/gia/general/201011/03/P201011030150.htm