

立法會 *Legislative Council*

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Subcommittee on Air Pollution Control (Marine Light Diesel) Regulation

Background brief prepared by the Legislative Council Secretariat

Purpose

This paper provides background information on the Air Pollution Control (Marine Light Diesel) Regulation ("the Regulation"), and gives a brief account of the views and concerns expressed by Members on the proposal to introduce regulatory control on the quality of marine light diesel ("MLD"), i.e. light diesel oil used by marine vessels, which includes imposing a cap on its sulphur content in order to reduce emissions from vessels.

Background

2. Air pollution is one of the major problems in Hong Kong. According to the International Maritime Organisation, air pollution from marine vessels is substantial and growing, causing serious and increasing public health and environmental impacts. In 2011, local vessels¹ contributed about 21%, 32% and 57% of the total emissions of sulphur dioxide ("SO₂"), respirable suspended particulates ("RSP") and nitrogen oxides from the marine sector.

3. At present, the quality of fuels supplied to marine vessels is not regulated. Local vessels are normally fuelled by light diesel with a sulphur content of about 0.5%. As vessel emissions could affect the residential developments in the coastal areas, there is a need to reduce these emissions for better protection of public health. Lowering the sulphur content of MLD is an effective means to reduce the emissions of SO₂ and RSP by local vessels.

¹ "Local vessels" in this context cover domestic vessels operating restrictively within Hong Kong waters and river vessels plying between Hong Kong and the Pearl River Delta ("PRD") ports.

4. In May 2012, the Administration set up a Working Group on Upgrading the Quality of MLD ("the Working Group") to examine the technical feasibility of upgrading the quality of local MLD by reducing the limit on sulphur content from 0.5% to 0.05%. The University of Hong Kong was commissioned to conduct the technical study. The study was completed in January 2013 and it confirmed the technical feasibility of powering local vessels with 0.05% sulphur diesel (hereinafter referred to as "low sulphur diesel ('LSD')"). The key findings of the study are set out in **Appendix I**.

Operational cost implications

5. The Administration has advised that according to the fuel cost data from January 2012 to February 2013, the fuel cost differential² between LSD and high sulphur diesel ("HSD"), i.e. 0.5% sulphur diesel, should be not more than HK\$0.07/litre, or 1% based on current retail price of about HK\$7/litre. A leading global provider of benchmark price assessments for diesel market has also advised that the demand and supply of HSD in Asian market have been declining, whereas those of LSD have been growing. As such, the price gap between HSD and LSD would keep narrowing down. On the other hand, as the use of LSD could give rise to a saving arising from the reduction in engine oil consumption, slower deterioration of engine oil and engine performance improvement (because the exhaust gas is less acidic and less corrosive), part of the possible fuel cost increase would be offset.

The Regulation

6. The Regulation provides for the specifications that must be met by MLD supplied in Hong Kong as well as the requirement on MLD importers and suppliers to keep relevant records. The key provisions of the Regulation are summarized as follows –

- (a) Locally supplied MLD must contain not more than 0.05% sulphur by weight and comply with the specifications stipulated in the Regulation;
- (b) MLD importers are required to submit monthly reports to the air pollution control authority ("the Authority", i.e. the Director of Environmental Protection); and

² It refers to the average difference in Singapore free-on board ("FOB") prices between these two fuels. FOB includes the transportation costs of fuel to the port of Singapore, the loading cost and the material cost.

- (c) MLD suppliers are required to keep transaction records regarding their acquisition and supply of MLD for three years and submit the records to the Authority for inspection if requested.

7. The Regulation aims to control the supply of MLD in the local market, while MLD trading activities that do not involve sale, supply or distribution (such as import for re-export, stock movement within the same oil company) are not subject to the Regulation. The proposed offence and penalty regime are set by making reference to the similar provisions and arrangements under the Air Pollution Control (Motor Vehicle Fuel) Regulation (Cap. 311L) for cases of non-compliance.

8. The Regulation will take effect on 1 April 2014. Upon the implementation of the Regulation, the Administration expects that SO₂ and RSP emissions from the marine sector will be reduced by 19% and 10% respectively.

Deliberations by Members

Panel on Environmental Affairs

9. The Panel on Environmental Affairs ("the Panel") was consulted on the proposal to upgrade the quality of local MLD by imposing a statutory sulphur limit of 0.05% on locally supplied MLD on 25 March 2013. The Panel then held a meeting on 22 July 2013 to receive public views on the proposal. The major views and concerns expressed by members on the proposal were summarized in the ensuing paragraphs.

10. While members were supportive of the general principles of the proposal which was meant to protect the environment, they held different views on the implementation details. Noting the vessel operators' views on the need to regulate the diesel price upon the introduction of LSD and to open the fuel supply market to promote greater competition, some members expressed concern about the possible increase in fuel prices if LSD was the only kind of vessel fuel that could be used in Hong Kong. There was also the concern about the pollution associated with the use of lower grade vessel diesel by river-trade vessels plying between PRD and Hong Kong ports.

11. A member reflected the ferry operators' concern about the increased operating cost brought about by the proposal and the impact on their operation. He suggested that the Administration should consider providing subsidies for ferry operators when implementing the proposal lest the increase in operating cost would be transferred to passengers. In view of the continuing need for tightening diesel standards, he enquired whether the Administration would

consider providing subsidies for the replacement of vessel engines, similar to the replacement of aged diesel vehicles. Some other members also suggested that incentives be provided for local marine vessels to encourage them to switch to LSD. However, another member opined that the Administration should not subsidize ferry companies in their use of cleaner fuels as the resultant increase in operating cost should be borne by ferry operators who could pass on the cost to passengers through increase in fares.

12. The Administration responded that the oil companies had confirmed the availability of LSD which was a standard and common grade of diesel supplied in Singapore and hence there would be no issue of monopolization. Many local crafts and river-trade vessels opted to refill their vessel fuels in Hong Kong as they were of a better quality and less costly than that supplied in the Mainland. While the Administration had no plans to subsidize the marine trade for introducing the proposal because of the insignificant price increase, it suggested that the trades could put forward their views for its consideration.

13. As the technical feasibility study had only been conducted on two engine models, a member was concerned about the compatibility of LSD with two other engine models which were used by about 10% of the fishing trades. Moreover, some of the trades had indicated that the use of LSD had reduced the performance efficiency of their vessels by 5%. The member supported that more feasibility studies be conducted on fuel efficiency as well as other engine models. The Administration explained that the choice of engines for use in the technical feasibility study had been agreed by the Working Group which had representatives from the fishing trades. The Working Group had agreed that testing on the two selected engine models could serve the purpose. As regards fuel efficiency, the findings of the technical feasibility study had indicated that the change in specific fuel consumption for load variation during operation between HSD and LSD was small.

14. Noting that the Mainland would adopt a standard with sulphur limit of 0.035% for diesel supplied to local vessels in July 2013, a member questioned why Hong Kong would adopt a higher sulphur limit of 0.05%. The Administration responded that the emission performance of using marine light diesel with 0.035% and 0.05% sulphur content was comparable. The Administration also undertook to provide a breakdown on the emissions from local vessels, river-trade vessels and ocean-going vessels. The information was circulated to Panel members vide LC Paper No. CB(1)1695/12-13(01) on 14 August 2013.

Latest development

15. The Regulation was gazetted on 17 January 2014 and tabled in the Council on 22 January 2014. At the House Committee meeting on 24 January 2014, Members agreed that a subcommittee should be formed to examine the Regulation.

Relevant papers

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

Council Business Division 4
Legislative Council Secretariat
4 February 2014

Key findings of the study on the technical feasibility of upgrading the quality of local marine light diesel

(a) Maximum Power Output

The maximum power output of the engines could be maintained when using low sulphur diesel ("LSD"). There was a minor drop (average -1.8%, range from -5.0% to +0.1%) for the Gardner engine but a minor increase (average +0.4%, range from -0.1% to +0.7%) for the Cummins engine. These small variations are insignificant and unnoticeable during operation.

(b) Fuel consumption under constant loading conditions

There was a small increase in specific fuel consumption ("SFC") by +1.1% (range from -1.3% to +2.9%) for Gardner engine and +1.3% (range from +0.8% to +2.1%) for Cummins engines when running on LSD. This is in line with the fact that the net calorific value of LSD is slightly lower.

(c) Fuel consumption for load variation during operation

The change in SFC for load variation during operation between high sulphur diesel and LSD was also small, about +1.4% (range from +0.8% to +3.0%) for Gardner engine and +1.3% (range from +1.2% to +1.5%) for Cummins engine.

(d) Wear and tear

No wear and tear in fuel injectors and pump was observed.

(e) Engine oil (lubrication oil) consumption and deterioration

The test recorded lower engine oil consumption, slower decrease in total base number and slower increase in viscosity when the engine ran on LSD. This means lower operating costs for LSD because the engine oil needs fewer replacement/replenishment.

Appendix II

List of relevant papers

Council/ Committee	Date of meeting	Paper
Panel on Environmental Affairs	25 March 2013	<p>Administration's paper on "Upgrading the diesel standard for local vessels" (LC Paper No. CB(1)736/12-13(05)) http://www.legco.gov.hk/yr12-13/english/panels/ea/papers/ea0325cb1-736-5-e.pdf</p> <p>Background brief on "Upgrading the quality of local marine light diesel" prepared by the Legislative Council Secretariat (LC Paper No. CB(1)736/12-13(06)) http://www.legco.gov.hk/yr12-13/english/panels/ea/papers/ea0325cb1-736-6-e.pdf</p> <p>Minutes of meeting (LC Paper No. CB(1)1331/12-13) http://www.legco.gov.hk/yr12-13/english/panels/ea/minutes/ea20130325.pdf</p>
Panel on Environmental Affairs	22 July 2013	<p>Administration's paper on "Upgrading the diesel standard for local vessels" (LC Paper No. CB(1)736/12-13(05)) http://www.legco.gov.hk/yr12-13/english/panels/ea/papers/ea0325cb1-736-5-e.pdf</p> <p>Background brief on "Upgrading the quality of local marine light diesel" prepared by the Legislative Council Secretariat (LC Paper No. CB(1)736/12-13(06)) http://www.legco.gov.hk/yr12-13/english/panels/ea/papers/ea0325cb1-736-6-e.pdf</p> <p>Minutes of meeting (LC Paper No. CB(1)25/13-14) http://www.legco.gov.hk/yr12-13/english/panels/ea/minutes/ea20130722.pdf</p> <p>Administration's supplementary paper on "Upgrading the diesel standard for local vessels" (LC Paper No. CB(1)1695/12-13(01)) http://www.legco.gov.hk/yr12-13/chinese/panels/ea/papers/ea0722cb1-1695-1-ec.pdf</p>

Council/ Committee	Date of meeting	Paper
Legislative Council	22 January 2014	Legislative Council Brief on "Air Pollution Control (Marine Light Diesel) Regulation" issued by the Environment Protection Department in January 2014 (Annex 4 to EP 150/NV/24) http://www.legco.gov.hk/yr13-14/english/subleg/brief/2_brf.pdf