**AIR QUALITY OBJECTIVES (AQO) REVIEW WORKING GROUP**
**MARINE TRANSPORTATION SUB-GROUP**

**Digest of the 3rd Meeting**
**held on 22 September 2016 at 2:30 p.m.**
**in Conference Room, 33/F., Revenue Tower, 5 Gloucester Road, Wanchai**

**Present:**

| | |
|---|---|
| Mrs. Alice CHEUNG | Deputy Director of Environmental Protection (3) **(Vice-chairperson)**, Environmental Protection Department (EPD) |
| Mr. Arthur BOWRING | |
| Mr. CHIANG Sui-ki | |
| Ms. Jessie CHUNG | |
| Mr. Ellis CHUNG | |
| Mr. FUNG Pak-sing | |
| Mr. Sunny HO | |
| Mr. KEUNG Siu-fai | |
| Mr. KWOK Tak-kee | |
| Mr. David KONG | |
| Mr. David WONG Yui-cheong | |
| Mr. Tony TONG | |
| Mr. Simon NG | |
| Mr. MOK Wai-chuen | Assistant Director of Environmental Protection (Air Policy), EPD |
| Mr. Brian LAU | Acting Principal Environmental Protection Officer (Air Policy), EPD |
| Ms. Louisa YAN | Principal Assistant Secretary (Transport)10, Transport and Housing Bureau (THB) |
| Mr. CHOI Chi-chuen | Senior Surveyor of Ships (Planning and Training), Marine Department (MD) |
| Mr. LUI Kam-leung | Senior Surveyor of Ships (Technical Policy 2), MD |

**In Attendance:**

| | |
|---|---|
| Ms. Josephine HO | Acting Senior Environmental Protection Officer (Air Policy) 1, EPD |
| Dr. Peter LOUIE | Senior Environmental Protection Officer (Air Policy) 5, EPD |
| Mr. Simon LAM | Environmental Protection Officer (Air Policy) 11, EPD |
| Dr. Jackie NG | Assistant Environmental Protection Officer (Air Policy) 12, EPD |

**Absent with apologies:**

Ms. Christine LOH, Under Secretary for the Environment **(Chairperson)**, Environment Bureau (ENB)

Mr. LAI Ying-keung, Chief (Marine Policy), MD

Ms. Sandy MAK

Prof. John LIU Jian-hua

Mr. Jeff BENT

The **Vice-chairperson** informed Members that Mr. CHEN Huan-you had withdrawn from the sub-group as he had been transferred to the Mainland's office and would arrange a stand-in Member.

[*Post-meeting note: Mr. Danny Wu would stand in for Mr. CHEN in the Marine Transportation Sub-group.*]

**Agenda Item 1 – Confirmation of Digest of the Second Meeting**

2. The draft digest of the second meeting held on 22 July 2016 were confirmed without amendment.

**Agenda Item 2 –Discussion on key considerations for the implementation of proposed measures under "Use of clean fuel"**

3. Mr. KEUNG Siu-fai declared his interest that his company would apply for government funding to test out electric vessels.

4. The Administration informed Members that the purpose of this meeting was

to collect Members' views on the key considerations for implementing the proposed measures under "Use of clean fuel". The Secretariat had provided Members with a set of draft proformas with evaluations on the key considerations of the proposed measures before the meeting.

5. The Administration briefed Members on the evaluations of key considerations for implementing the proposed measures under "Use of clean fuel".

6. Members' comments on the key considerations for implementing the proposed measures under "Use of clean fuel" are summarized in the **Annex**.

7. The Administration made the following responses to further address other views/queries raised by the Members:

(a) The purpose of this meeting was to collect Members' views on the proposed measures under "Use of clean fuel" and their key considerations for implementation. The Secretariat would consolidate Members' views and provided an initial assessment on the practicability to implement the proposed measures for Members' consideration.

(b) For the proposed measures that were considered not practicable to be implemented in the short-term but are worth pursuing in the long term owing to their emission reduction potential, the Administration would keep in view their development in the international and regional context for examining the practicability and benefits of their introduction. Should their introduction be found practicable for improving air quality, the marine trade would be consulted.

(c) The Administration would take into account the readiness of relevant legislations when considering the practicability for the implementation of the proposed measures.

(d) The Administration agreed to a Member's suggestion to include the use of compressed natural gas (CNG) under item A2 (i.e. Explore the use of biofuel (e.g. B5), fuel cell, Liquefied Petroleum Gas (LPG), Compressed Natural Gas (CNG), methanol, nuclear and renewable energy, e.g. wind and solar energy,etc. for marine vessels).

(e) The Administration advised Members that the Government would

introduce local legislation requiring ocean-going vessels (OGVs) in Hong Kong waters to use low sulphur fuel in line with the national plan to set up a Domestic Marine Emission Control Area (DECA) in the Pearl River Delta (PRD) region in 2019.

**Agenda Item 3 – Any other business**

8. No other business was raised.

**Agenda Item 4 – Date of the next meeting**

9. The next meeting would be held on 29 November 2016 (Tuesday). The meeting was adjourned at 4:25 p.m.

**Annex**

## Measure A1 - Explore the use of Liquefied Natural Gas (LNG) for marine vessels

| Key Considerations | Comments from Members |
|---|---|
| 1. International trend and regulatory development in the use of clean fuel | ● A member considered that very few OGV operators will invest in LNG vessels under the prevailing poor business environment of the shipping industry.<br>● A member suggested that the Government shall consider international development, regulations and policies of the International Maritime Organization in the use of LNG as marine fuel as well as their use in our neighboring ports before establishing the policy framework of using LNG as marine fuel in Hong Kong.<br>● Another member advised that the mainland authority has been providing subsidies to cargo vessels navigating along the Yangtze River for switching to LNG-fueled propulsion, yet LNG-fueled river trade vessels plying the PRD region are still limited. |
| 2. Technology maturity for use in onboard vessels | ● No comments. |
| 3. Availability of vessels in the market | ● Although there was suggestion that more LNG vessels including those powered by dual-fuel engines would be available in the market in the near future, a member opined that limited OGV operators will be willing to invest in LNG vessels under the current business downturn of the shipping industry. Nevertheless, Hong Kong shall plan ahead for the necessary policy and legislation in using LNG as marine fuel. |
| 4. Bunkering facilities | ● A member opined that the LNG storage area requires much more space than conventional fuel and that existing fuel terminals in Hong Kong could not be further expanded to accommodate LNG receiving and storage facilities. In addition, the development of LNG receiving terminal in existing fuel terminals would require a substantial amount of investment. Given the current business downturn of the |

| Key Considerations | Comments from Members |
|---|---|
| | shipping industry, some members considered it is not imminent for Hong Kong to develop LNG bunkering facilities.<br>● Some members suggested several options of land-based or offshore LNG bunkering facilities, such as LNG bunkering facility on an island, a regional LNG bunkering facility to serve Hong Kong ports as well as other neighbouring ports in the PRD region, and ship-to-ship bunkering to allow flexibility in reaching vessels berthed at different locations. These developments, however, would require detailed planning for site selection, substantial investment and therefore take a long process.<br>● Although there were suggestions that the availability of LNG bunkering facilities in Hong Kong may attract more OGV operators deploying their LNG-fueled OGVs calling Hong Kong ports and enhance the willingness of the operators of local vessels to invest in LNG vessels, some other members opined that the number of new LNG container vessels to be built in the coming years would be few and it is not imminent for Hong Kong to have LNG bunkering facilities. |
| 5. Fuel supply | ● No comments. |
| 6. Cost implications | ● Owing to the substantial capital investment required for building/retrofitting LNG-fueled vessels, a member opined that limited OGV operators will be willing to invest in LNG vessels under the current business downturn of the shipping industry, despite the suggestion that the cost of LNG-fueled vessels might be lowered when there are more supplies in the market in the near future.<br>● A member opined that LNG is generally more expensive than bunker fuel (HFO) but less expensive than distillate fuels such as the marine gas oil (MGO). |
| 7. Safety considerations | ● A member advised that safety considerations associated with the use of LNG as marine fuel had been assessed by the IMO. |

**Measure A2 - Explore the use of biofuel (e.g. B5), fuel cell, Liquefied Petroleum Gas (LPG), Compressed Natural Gas (CNG), methanol, nuclear and renewable energy, e.g. wind and solar energy,etc. for marine vessels**

| Key Considerations | Comments from Members |
|---|---|
| 1. International trend and regulatory development in the use of clean fuel | ● A member stated that many countries do not allow nuclear-powered vessels to enter their ports. |
| 2. Technology maturity for use in onboard vessels | ● A member advised that biofuel is not suitable for use in OGVs due to its tendency to block fuel filters after prolonged use. Another member considered that biofuel might be more viable on local vessels whose diesel engines are generally compatible with B5 or B10 biodiesel.<br>● A member considered CNG might be more suitable for use on small local vessels which require smaller space for fuel storage.<br>● Members considered that other alternative fuels are not technically or commercially viable for marine application. |
| 3. Availability of vessels in the market | ● No comments. |
| 4. Bunkering facilities | ● No comments. |
| 5. Fuel supply | ● Although biofuel and CNG might be technically viable on small local vessels, there is currently no supply chain network to secure stable supply of the fuels for marine application. A member also advised that the supply of locally produced B5 biodiesel would not be sufficient to meet the demand in marine application. |
| 6. Cost implications | ● A member considered that retrofitting existing vessel or buying new vessels for using the alternative clean fuel would not be commercially viable. |
| 7. Safety considerations | ● No comments. |

**Measure A3 - Explore the use of hybrid, diesel electric and electric vessels**

| Key Considerations | Comments from Members |
|---|---|
| 1. International trend and regulatory development in the use of clean fuel (e.g. battery development for electric vessels) | ● No comments. |
| 2. Technology maturity for use in onboard vessels | ● A member opined that hybrid and electric vessels are not suitable for use in OGVs. Their applications are only limited to short-haul and low-speed vessels with small propulsion systems.<br>● A member stated that diesel-electric technology is well developed and widely adopted in cruise ships which have large power demand for hotel services, while another member added that diesel-electric propulsion system would not be applicable to high-speed vessels. |
| 3. Availability of vessels in the market | ● Electric and hybrid vessels are mainly available in the North America and Europe, while the market of diesel-electric vessels is well developed.<br>● A member opined that the government may consider taking the lead in using these technologies in their fleets before their practicability for use in local merchant shipping could be ascertained. |
| 4. Bunkering facilities | ● No comments. |
| 5. Fuel supply | ● A member opined that connecting and disconnecting cable for charging batteries of electric vessels would impose constraints to the operation and suggested exploring whether wireless inductive charging technology could be adopted, similar to the one for super-capacitor electric buses. |
| 6. Cost Implications | ● A member considered that diesel-electric vessels require lower investment cost compared with hybrid and electric vessels. |
| 7. Safety considerations | ● No comments. |

**Measure A4 - Ocean-going vessels (OGVs) at berth to use marine diesel with lower fuel sulphur content, e.g. not exceeding 0.1%**

| Key Considerations | Comments from Members |
|---|---|
| 1. International trend and regional situation in the use of lower sulphur fuel | ● A member advised that from 1 January 2019, all vessels within the DECA in the PRD region would be required to use low sulphur fuel (sulphur content not exceeding 0.5%). By end of 2019, the Chinese government would determine if the sulphur limit should be further tightened to 0.1%. |
| 2. Fuel supply | ● A member advised that there is sufficient supply of marine diesel with sulphur content below 0.1% in Hong Kong and the oil refineries in China are capable of producing 0.1% sulphur fuel to meet the more stringent fuel sulphur requirement. Supply of 0.1% sulphur fuel in mainland's ports should not be a problem in the foreseeable future. |
| 3. Cost implications | ● A member expected that the price of low sulphur distillate oil would go up further as the demand continues to grow. |
| 4. Trade reaction | ● A member considered that the mandatory use of marine diesel with sulphur content not exceeding 0.1% would impose heavy burden to OGV operators during the current business downturn of the shipping industry. Government's measures to relieve their financial burden were suggested to encourage OGV operators to use 0.1% sulphur marine diesel. |
| 5. Implications on port competitiveness | ● To minimize the implications for port competitiveness, members considered that the proposal to further tighten the sulphur content of marine diesel to 0.1% should tie in with the implementation plans in other competing neighbouring ports, e.g. Shenzhen. Other measures similar to the Port Facilities and Light Dues Incentive Scheme for OGVs could also be considered to reduce financial burden of the shipping trade due to the additional fuel cost. |

**Measure A5 - Local vessels to use electricity from the power grid while at berth**

| Key Considerations | Comments from Members |
|---|---|
| 1. Infrastructure and ancillary facilities for power grid connection system | ● Electricity connection facilities could be set up at ferry terminals but some members advised that it is difficult for small local vessel operators to apply for dockside electricity supply from the power companies especially at public piers and typhoon shelters. |
| 2. Availability and popularity of vessels capable to connect to the power grid | ● A member advised that only minor modifications of existing onboard electrical system would be needed to make local vessels capable to connect to the power grid. |
| 3. Operation and maintenance needs and cost | ● A member opined that the use of electricity from the power grid for local vessels during berthing would reduce the operation of their ancillary engines or generators and hence the needs of maintenance.<br>● A member considered the cost of installing electricity connection system on local ferries to be low.<br>● Another member advised that using electricity from the power grid would be cheaper compared with using on-board diesel generator. |
| 4. Trade reaction | ● The trade of local vessels generally welcomed the proposed measures to develop dockside electricity connection facilities at ferry piers for their use. |

**Measure A6 - River trade vessels to use OPS while at berth at terminals**

| Key Considerations | Comments from Members |
|---|---|
| 1. Infrastructure and ancillary facilities for OPS system | ● A member opined that the terminals have limited space for setting up the required infrastructure and OPS facilities. |
| 2. Availability and popularity of OPS-ready vessels | ● No comments. |
| 3. Operation and maintenance needs and cost | ● There are currently around 200 river trade vessels (RTV) calling Hong Kong daily. Terminals in Hong Kong do not have sufficient fixed berths for RTV. In addition, berthing time of RTV is usually short and members considered that the use of OPS would impose operational constraints on both the RTV and terminal operators, and therefore may hinder efficient port operation.<br>● A member advised that the associated cost implications in setting up OPS facilities at terminals would not be a major concern. |
| 4. Trade reaction | ● Members considered that the operational constraints due to the use of OPS (e.g. time required for connection/disconnection of charging cables) would be the major concerns to the terminal and RTV operators. They did not consider the use of OPS by RTV to be practicable given the current insufficient berths for RTV. |

**Measure A7 - OGVs to use OPS while at berth**

| Key Considerations | Comments from Members |
|---|---|
| 1. Infrastructure and ancillary facilities for OPS system | ● A member considered that significant infrastructure civil works would be required for the installation of OPS facilities.<br>● Another member advised that there are currently no international standards established for the power supply and shipboard electrical system for OPS. |
| 2. Availability and popularity of OPS-ready vessels | ● Although many newly-built OGVs nowadays are OPS-ready, a member advised that cruise companies would likely deploy majority of their OPS-ready cruise ships in the Pacific Northwest region where electricity is cheap and cleanly generated.<br>● A member also suggested that scrubbers are getting more popular than OPS in OGVs as they can be installed inside the existing smokestacks of the cruise ships instead of occupying the revenue-generating cabins alongside the exterior of the ship like the OPS system. |
| 3. Operation and maintenance needs and cost | ● No comments. |
| 4. Trade reaction | ● For OGV operators, a member opined that substantial investment in retrofitting existing OGVs with OPS connection system is required. Other concerns include the charging of the OPS system, the cost difference in using electricity compared to using traditional fuel and the associated maintenance cost. Unless there are international standards and timetable established by the IMO in mandating the use of OPS to all OGV liners, the operators would prefer using low sulphur fuel over OPS.<br>● Another member opined that while OPS would not help OGV operators to meet the emission requirements in the DECA in PRD region as it only reduces emissions from OGVs during berthing, OGV operators would opt to invest in other clean technology such as using LNG as fuel and scrubber instead of OPS-ready vessels to comply with the DECA requirements. |

| Key Considerations | Comments from Members |
|---|---|
| | ● A member stated that terminal operators would share similar views with OGV operators that the lack of unified international standard of OPS may not warrant their investment. |