INTERNATIONAL MARITIME ORGANIZATION

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PREVENTION OF AIR POLLUTION FROM SHIPS

Comments on the outcome of BLG 12 on the review of MARPOL Annex VI and the NO_x Technical Code

Submitted by the International Bunker Industry Association (IBIA)

SUMMARY

Executive summary:	This document presents arguments for ensuring that amendments to MARPOL Annex VI, regarding emissions to air of the combustion of marine fuels, are based upon the principal of regulating and setting limits on emissions
Strategic direction:	7.3
High-level action:	7.3.1
Planned output:	7.3.1.1
Action to be taken:	Paragraph 16
Related documents:	BLG 12/6/1, BLG 12/WP.6, BLG 12/WP.1 and MEPC 57/4/23

1 This document provides comments on document MEPC 57/4/23 and is submitted in accordance with paragraph 4.10.5 of the Committees' Guidelines (MSC-MEPC.1/Circ.1) and the relaxed deadline for comments documents on the air pollution item to MEPC 57 with prior authorization of the MEPC Chairman following consultations with the Secretariat in line with paragraph 4.12 of the Committees' Guidelines.

2 BLG 12 discussed options to control emissions of SO_x and PM and also the impact of controls, and concluded the meeting with three proposals to amend MARPOL Annex VI. The meeting considered fuel based options, as well as technology and exhaust after treatment systems. All three of the consolidated options do not preclude the use of technology to reduce air emissions, however they all mention fuel sulphur limits and Option 2 mentions a sulphur cap.

3 The following paragraphs are provided to point out the benefits of setting emissions limits, as opposed to a prescriptive fuel based approach. It also points out that a number of the arguments, for a fuel based approach, deal with issues of environmental and health risk. These arguments have not been dealt with in a risk based manner and could lead to unexpected and significantly negative consequences to seafarer safety and the environment.

Location of emissions

4 The report of the Group of Experts recorded the outcomes of emissions modelling, undertaken by the Norwegian Metrological Institute, concluded that emissions reductions close to receptors provided the maximum benefit in terms of emissions reductions versus ship emission limits. The implication of this study is that significantly lowering emissions in port areas will have much greater benefit than a more modest reduction in emissions over a wider area.

5 Modelling and measurement undertaken in the Port of Dover (1) is further evidence that local and significant emissions reductions have much greater impact on local air quality than that of the traffic passing by Dover through the English Channel. The Dover study measurements directly link local vessel activity with changes in air quality, whilst the affect of the intense traffic in the Channel has no significant impact.

Environmental and health impacts of marine fuels

6 The nature of the shipping industry is one associated with numerous and varied hazards. Despite the risks, the industry, when operated to high standards of competence, training and management, has an excellent track record of safety and limited harm to the environment.

7 It has been argued that the elimination of residual fuel oils will reduce the impact to the marine environment in the event of a fuel spill, or accidental release. Environmental Chemist, Christopher Reddy of Woods Hole Oceanographic Institute (WHOI) (2), recently published some of the details of his long term studies of diesel and residual fuel spills in the United States. In all cases the impact of residual fuel oil spills was more visual. However, the clean up is normally easier with no long term impacts, on average beyond one year. In the case of diesel spills the ability of the fluid to penetrate sea-beds and disperse have in some cases had consequences still evident after 30 years from the clean-up.

8 The Scientific Group of Experts could not identify any long term studies of harm caused by the widespread use of residual fuels on board ship since the 1960s. There is a body of evidence that the use of diesel fuel on board ships has lead to a significant rise in the occurrences of dermatitis. Without proper risk management, health and safety training, and protective clothing, diesel fuel, which is often used as a cleaning and solving agent, will continue to present a hazard to seafarers. Conversely, the likelihood of contact with residual fuel oil on board ship is largely limited and confined to engine fuel system leaks and centrifuge maintenance.

9 There is a significant body of work indicating that the use of cleaner fuels may be responsible, under certain conditions, to the formation of a significant number of nano-particles (3) based on condensing hydrocarbons. Nano-particles have the possibility of deep ingestion into human respiratory tracts as a potential precursor to a variety of human health impacts. The work concludes that there is a link with the shortage of nucleation points when using cleaner fuels and the predominance of hydrocarbons condensing into very fine particles. It can be concluded that this represents an as yet un-quantified risk to the widespread adoption of distillate fuels, when compared to the use of exhaust after-treatment, such as scrubbing technologies which are able to condense, nucleate and wash out hydrocarbons eliminating both the hydrocarbon emission and the potential for the formation of fine particles. The after-treatment effect is likely to result in lower emissions of particulates, even when operating on residual fuel oil, when compared to the emissions from the combustion of 0.5% S distillate.

10 The current evidence would suggest that prescribing a marine fuel to tackle emissions to air is unlikely to have a significant health or environmental benefit. Any hydrocarbon fuel presents risks and the need for risk management strategies should not be confused with the need to define means to reduce emissions to air from the combustion of marine fuels.

Green house gas emissions

11 With the current growth rates of the shipping industry, and the report of the Group of Experts forecast for increased fuel consumption by 2020, it is almost inevitable that the shipping industry may be called upon to reduce total emissions of CO_2. It is clear that there could be a number of approaches to the reduction in CO_2, including speed reduction, alternative propulsion systems and lower CO_2 footprint marine fuels. The Group of Experts reported that a switch to a prescribed fuel, such as a distillate, would result in a significant net increase in CO_2 on a well to propeller basis. Regulating emissions to air will ensure that the shipping industry retains the options to both meet future emissions requirements and contribute to the lowering of CO_2 emissions.

Industrial emitters

12 It is unusual for the emissions of large combustion plants to be regulated by only prescribing the input fuel and/or the fuel quality. All recent regulations requiring reduced emissions to comply with air quality ambitions or targets utilise either a performance based or goal based approach. In the former the emission is limited at the end of stack emission and in the latter emissions may be aggregated and regulated as an overall emission, or possibly an emissions cap on multiple emitters.

13 The basis for this approach is that regulators recognise that industrial plants often have a number of energy sourced options and a number of technology sourced options. Industrial plants are usually not constrained by space or weight. For most ships similar principles apply. Shipowners are keenly aware of their energy costs and have a track record of adaptability to increase efficiency, lowering their unit costs. Adopting the principle of an emissions limit, either goal based or more simply performance based, will enable more cost effective outcomes to be achieved, retaining efficiency of marine transportation.

14 The second largest power station in the United Kingdom with a rated output of 2.3GW utilises seawater scrubbing technology (4) to achieve emissions below the regulated level whilst burning high sulphur coal and a variety of sustainable fuels such as palletised bio mass. The power station's exhaust after-treatment system enables both fuel flexibility and use of local seawater to neutralise sulphur and scrub out particles. Although the majority of power stations utilise scrubbers that require consumables, such as lime or caustic, there are nevertheless over 15 power stations globally that utilise sea water scrubbing technology.

IMO strategic directions

15 The document entitled "STATUS OF PLANNED OUTPUTS SPECIFIED IN THE HIGH-LEVEL ACTION PLAN RELEVANT TO THE SUB-COMMITTEE" records IMO's strategic intent and principles. The section titled "Enhancing the profile of shipping and instilling a quality culture and environment conscience" records the following intent:

(Paragraph 7) IMO will focus on reducing and eliminating any adverse impact by shipping on the environment by:

- (Paragraph 7.3) Contributing to the international efforts to reduce atmospheric pollution and address global warming;

- (Paragraph 7.3.1) Keep under review IMO measures to reduce atmospheric pollution and address global warming;

- (Paragraph 7.3.1.1) New or amended IMO instruments (MEPC) "Guidelines on other technological methods verifiable or enforceable to limit SOx emissions";

- (Paragraph 12) Strategic Directions (SDs) (A.989(25)) IMO will take the lead in enhancing the quality of shipping by;

- (Paragraph 12.1) Encouraging the utilization of the best available techniques not entailing excessive costs, in all aspects of shipping; and

- (Paragraph 12.1.2) Use of risk-based tools that take account of costs and the human elements in the development of operational standards.

Action requested of the Committee

16 The Committee is invited to consider and adopt the principal that amendments to MARPOL Annex VI regulation 14 should be based upon air emissions limits enabling multiple solutions for compliance as opposed to the prescribed fuel approach.

References

1) Dover District Council. Air Quality Action Plan (Eastern Docks Dover) Progress Report April 2007 http://www.dover.gov.uk/environmental-health/aq_progress-nov06.asp

2) Would spills of bunker fuel alternatives be even worse? Christopher Reddy, Friday, 14th December 2007, page B-15, San Francisco Chronicle http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/12/14/EDM3TTDAO.DTL&hw=cosco+busan&sn=001&sc=1000

3) Formation of Nano-particles during Exhaust Dilution. David Kittelson and Imad Abdul-Khalek, 18-20 January 1999, University of Minnesota, Dept of Mechanical Engineering http://www.me.umn.edu/centers/cdr/reports/OtherEFI.pdf

4) ScottishPower Announces Decision to Opt Longannet Power Station into LCPD http://www.scottishpower.com/PressReleases_530.htm.

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