

Control of ship emissions: Analysis of amendments to MARPOL Annex VI and implications for the Mediterranean

Bunkerworld asked Pedro-Miguel Martínez Sánchez, Products Technology Manager at Compañía Española de Petróleos, S.A (CEPSA) for his expert and in-depth views of Annex VI's proposed new provisions and its regional impact.

The approval given by the Marine Environmental Protection Committee (MEPC 57) of the International Maritime Organization (IMO) to a package of amendments to the MARPOL Annex VI (Prevention of Air Pollution from Ships) in the first week of April 2008 was undoubtedly a global milestone and a watershed event, akin to other landmark achievements such as, on a world scale, the implementation in 2005 of Annex VI of MARPOL 73/78 and in the European Union, Directive 2005/33/EC (Revision of Directive 1999/32/EC, regarding marine fuels).

We should take into account that, given the nature of the maritime sector, any regulatory regime affecting it should be globally enforceable and, with regard to the control of air emissions from ships, we can help avoid the proliferation of unilateral

local or regional legislation, and the excessive burdening, among other things, of operational requirements for the shipping industry.

The current Annex VI addresses the control of Sulphur Oxides (SO_x) and Nitrogen Oxides (NO_x) emissions, and its revision, as agreed by the MEPC 53 of July 2005, widened the scope to include Particulate Matter (PM) and Volatile Organic Compounds (VOC). Although this revision regulates tighter control of emissions of the first two pollutants and provides a strategy for the reduction of VOC in the loading and shipment of crude oil and in port and terminal operations, it does not achieve the same response to the issue of PM abatement which, given the complexities and uncertainties involved, and the need for further data on PM formation and production, was addressed in

an indirect way through the use of cleaner fuels or alternative gas treatment or scrubbing systems. The focus of my comments in this article will be on the control of SO_x and PM emissions.

A Road Map

Everyone is well aware of the fact that maritime transport, which is estimated to account for roughly 90% of total world trade, is remarkably environmentally-friendly and efficient, producing one of the lowest levels of pollutant emissions and having the lowest costs per unit transported and distance covered. Although emissions from ships are still currently lower than those produced by land, considering the increase in maritime activity, we can expect this gap to gradually narrow. Despite this, the latest studies undertaken for the IMO by the Expert Group

(EG) sustain that in 2020, SO_x and PM emissions from land-based sources will still be higher.

In order to analyze the agreement reached and which is due to be formally adopted by the MEPC 58 in October 2008, we should take another look at some of the key elements contained in what I refer to as a Road Map to follow in the revision process:

- Input from the Informal Cross Government/Industry Scientific Group of Experts will be significant for the content of the Annex VI Amendment. It must include validation of the conclusions of all relevant existing studies.
- Whichever measures are adopted, they should be based on sound scientific principles.
- In connection with the previous point, a holistic approach should be applied to

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avoid any negative impact of other policies (e.g. the increase of net CO₂ that would result from certain proposals).

- A goal-based approach to air emissions, setting rational limits for pollutants over the long-term would be a clear and effective signal to the shipping industry and all parties involved to develop the most effective measures to achieve the objective.
- Effective and feasible measures should be adopted for immediate implementation (the same date as the one scheduled for the Annex VI Amendment) on the basis of tighter measures in Regulation 14.
- Any agreement for long-term measures focused on fuel quality is illogical and premature. They should not be defined without sufficient scientific basis to determine needs and a realistic/achievable path to get there. For the time being, these conditions have not been fulfilled.
 - ♦ Fuel quality is not the only factor affecting emissions.
 - ♦ Developments in engine technologies will help achieve the objective.
 - ♦ The use of effective technologies for exhaust gas cleaning should also be permitted.
 - ♦ There is a significant lack of information regarding PM control.
- Consider the introduction of a review clause in order to proceed in a few years with the development of new measures, if justified, once the effects of the agreed measures in the present review of the Annex on the environment and the conclusions of the studies are known.
- Evaluate the need for the establishment of a Steering Committee, representing all parties, under the umbrella of IMO, which could contribute to the effectiveness of future planning of the studies needed.

I believe this Road Map is essential for undertaking the revision of Annex VI, not only in terms of the contents of the revision itself but also the unequivocal need to comply with the established timeline and agenda, which has in fact been the case, so that we can anticipate that it will be adopted by the MEPC 58 in October and enter into force on March 1, 2010.

The work done by the EG has been exceptional given the very tight time restraints for taking action. In this regard, although I fully acknowledge the very positive contribution from the valuable and constructive information provided on refining-related issues, transportation developments, fuel demand, etc., in connection with the environmental impact study on the fuel alternatives evaluated, I would like to note that cost-benefit considerations were not properly taken into account for each option as compared to land-based measures and that instead of quantifying emissions, it may have been more useful and meaningful to measure their impact when surpassing critical loads in each of the affected areas.

Fuel Options

Out of the entire process of reviewing Annex VI, as regards fuel options, we should highlight the significance of the six options that were proposed to the "Bulk Liquids and Gases Subcommittee" (BLG

12) and considered by the EG (see diagram) and of the agreement that was ultimately reached (sulphur content in marine fuels), which is summarized below:

Global Cap:

3.50% on and after 1 January, 2012
0.50% on and after 1 January, 2020

Sulphur caps for ECAs:

1.00% on and after 1 March, 2010
0.10% on and after 1 January, 2015

A review of the limit set for 2020 shall be completed by 2018 to determine the availability of fuel. The MEPC shall establish a group of experts, to conduct the review. Based on the outcome of such a review, taking into account other criteria such as environmental considerations, the parties to MARPOL Annex VI will decide whether the global cap of 0.50% can be enforced from 1 January 2020 and if not, the global cap shall become effective on and after 1 January 2025 without any additional review.

Both scenarios allow for the use of cleaning or scrubbing systems for gases and alternative fuels for equal levels of emissions.

For both applications, in the event of a duly-justified and demonstrable lack of availability of compliant product, the new provisions will permit the storage and use of fuels with a higher-than-established sulphur content.

As I mentioned earlier in this article, the agreement reached by the MEPC 57 can be regarded as historical and indeed it is so, but it should be considered from two clearly-differentiated perspectives: measures for immediate or short-term application, and long-term measures. As regards the former, the IMO has been consistent with the General Assembly Resolution A.500 (XII) which was reinforced with Resolution A.777 (18). The same cannot be said, however, with regard to long-term measures. We should highlight the highly positive message that the Secretary General of the IMO gave the first day of the MEPC 57 on the criteria that should be taken into account to achieve an appropriate revision of Annex VI. This prompts me to question whether this long-term decision, which was sharply criticized and denounced before being adopted in the debate preceding it, may affect the IMO's credibility and hinder the ratification of Annex VI by Parties that have not yet done so.

Mediterranean Impact

From the moment that the North Sea was designated a SECA, there has been a significant increase in the use of LSFO, even using 1% LSFO (intended for power generation) once its quality was adjusted. The resulting demand for low-sulphur fuels to be used in SECAs has also arisen in the Mediterranean area, although not uniformly at all ports that supply these products. The type of ship and navigation route clearly affects demand trends.

It is obvious that low-sulphur fuels supplied at Northern European ports are heavily consumed in the SECAs, just the opposite of what occurs when supplies are made in the Strait of Gibraltar, extended to the Mediterranean. In this case, and depending on the port, only roughly 40% of fuel supplies would be used in the SECAs.

Hopefully, the newly-revised Annex VI

Marine Fuels Assessment: 2007/2020

| | 2007 Million mt | 2020 Million mt |
|--------------------------|--------------------|--------------------|
| Fuel consumption | 369 | 486 |
| HFO | 286 | 382 |
| Marine Distillate | 83 | 104 |

will not lead to a significant change in global demand over the next few years unless fuel suppliers' policies introduce logistical modifications. Undoubtedly, starting 1 March, 2010, with the reduction in sulphur content in fuels from the current 1.5% to 1.00%, the ratio distillate/residual fuels will change. One portion of the total will continue being residual fuel, which will be produced directly from processing low-sulphur crude oils or from blending other kinds with low-sulphur cutters, so that the demand for these components will climb. Another portion will be replaced with distillates: MDO or MGO, which will boost its consumption.

A completely different scenario will be seen after 2015 when the sulphur cap will be reduced to 0.10% and then it will only be possible to use distillates, and specifically MGO rather than MDO given that MGO already had this tightened specification in EU legislation. This will certainly aggravate the situation in the EU, despite the fact that some ongoing conversion projects are due to come on-stream, meaning that security of supply is not guaranteed, as stated in the EG's report.

It would seem reasonable for the residual fuel that is no longer being used in the SECAs to be re-allocated for general use outside these areas, which could contribute towards the reduction of average sulphur content in fuels for global use, whose global cap will be 3.50% on and after 1 January 2012.

For information purposes and to illustrate these trends worldwide and developments, below is a table showing the total volumes of marine fuels as assessed by the EG based on 2007 figures

and 2020 projections.

We should underscore that the supply/demand balance for fuels in SECAs with a 0.10% sulphur cap could be even more critical in 2015 than what is expected if other areas are designated SECAs (Emission Control Areas, or ECAs, in the revised annex), which is foreseeable if the request by some Parties to revise Appendix III of the current Annex VI, in order to ease conditions to be applied, gains momentum.

Thus, the Mediterranean, whose designation as a ECA is not justified to be declared today, could be in fact designated as a ECA under the new criteria. In addition, other regions, such as the US West Coast and Canada, may also be declared new ECAs.

Credibility

I am fully aware of the fact that the pursuit of better air quality is a goal we all embrace and towards which we all need to provide our contributions and input in order to minimize the impact of maritime air emissions. The measures to be adopted should be drawn up using a needs-analysis approach based on universally accepted and sound science principles.

I believe we all have to work in unison to bolster the IMO's credibility, standing and reputation. It is incumbent on us to develop the required studies based on sound and reliable data and credible research that shuns the type of sensationalism that seems prevalent nowadays, and without further delay, we could start to adopt future agreements in a rigorous and effective manner to respond to the concerns and expectations of society both now and particularly in the future. ■

Alternatives addressed to BLG 12

