



TOOL BOX FOR PORT CLEAN AIR PROGRAMS

Improving Air Quality While Promoting Business Development

INTERNATIONAL MARITIME REGULATIONS

The demand on ocean/sea going vessels (OGVs) to transport goods is dramatically increasing to accommodate to the rapid growth in international goods movement. Although OGVs are the most efficient mode of global transport, the increase in OGV movements and the resulting increase in emissions from OGV propulsion and auxiliary engines are causing concern. It is projected that ocean-going emissions will surpass land-based emissions if stricter standards are not put in place to address air emissions from OGVs.

Currently, there are international maritime regulations in place to reduce emissions from OGVs. However, there is a growing concern amongst ports and the maritime industry that the current regulations are not keeping pace with the increased demand on ship cargo transport and the emerging and proven technologies available to address OGV emissions. The following fact sheet provides a summary of the international maritime regulations established for ocean/sea going vessels.

MARPOL Annex VI

Under the authority of the United Nations (UN), the International Maritime Organization's (IMO) Marine Environment Protection Committee (MEPC) provides oversight on ocean/sea going vessels. On May 19, 2005, the Protocol of 1997 (MARPOL Annex VI) entered into force. MARPOL Annex VI sets limits on emissions of sulfur oxides (SO_x) and nitrogen oxides (NO_x) from ship exhausts and prohibits deliberate emissions of ozone depleting substances. The limits apply to the Parties or the Flag States under the conference delegation.

Annex VI will reduce SO_x by setting a global cap of 4.5% (on a mass basis, m/m) on the sulfur content of fuel used on board ocean/sea going vessels and by requiring the IMO to monitor worldwide average sulfur content on fuel. In addition, Annex VI contains provisions allowing for SO_x Emission Control Areas (SECAs) that will result in stricter controls on sulfur emissions in designated areas. Areas that have established a SECA require use of fuel with a sulfur content of 1.5% m/m. Under the Protocol of 1997, the Baltic Sea was established as a SECA.

Annex VI also sets limits on emissions of NO_x from diesel marine engines rated above 130 kW. The IMO developed a Technical Code which defines how this will be done. The current limits are based on the engine's rated speed as presented in the following table:

| Rated Engine Speed | Emission Limit, g/kW-hr |
|--------------------------------|---------------------------------|
| Less than 130 rpm | 17 |
| 130 rpm to less than 2,000 rpm | $45.0 \times \text{rpm}^{-0.2}$ |
| 2,000 rpm or greater | 9.8 |



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IMO Review and Amendments

2005

In July 2005, MEPC adopted amendments to MARPOL Annex VI at its 53rd session. The new amendments included the North Sea SECA and an update to the NO_x Technical Code. In addition, the Committee released information gained from the monitoring of worldwide sulfur content in fuel oils for 2004 which gave a three-year (2002 – 2004) rolling average of sulfur content in fuel oil worldwide of 2.67% m/m.

At the 53rd session, MEPC agreed to review and revise Annex VI and the NO_x Technical Code in order to take in account current technologies as well as advancing further emission reductions from ships. Specific orders from MEPC were given to the Sub-Committee on Bulk Liquids and Gases (BLG) to carryout the review by 2007. The BLG Committee's instructions included:

- Examine available and developing techniques for the reduction of emissions of air pollutants; review the relevant technologies and the potential for reduction of NO_x emissions and recommend future limits for NO_x emissions;
- Review technology and the need for a reduction of SO_x emissions and justify and recommend future limits for SO_x emissions;
- Consider the need, justification and possibility of controlling volatile organic compounds emissions from cargoes;
- With a view to controlling emissions of particulate matter (PM), study current emission levels of PM from marine engines, including their size distribution and quantity, and recommend actions to be taken for the reduction of PM from ships. Since reduction of NO_x and SO_x emissions is expected to reduce PM emissions, estimate the level of PM emission reduction through this route;
- Consider reducing NO_x and PM emission limits for existing engines;
- Consider whether Annex VI emission reductions or limitations should be extended to include diesel engines that use alternative fuels and engine systems/power plants other than diesel engines; and
- Review the texts of Annex VI, NO_x Technical Code and related guidelines and recommend necessary amendments.



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2006

In October 2006, MEPC moved forward on amendments to review and revise MARPOL Annex VI. The issues discussed by the MEPC include:

- Agreement on eight unified interpretations relating to the implementation and enforcement of MARPOL Annex VI, the NO_x Technical Code and related guidelines;
- Approval of standard form of the Sulfur Emissions Control Area (SECA) Compliance Certificate to facilitate uniform enforcement and port State control;
- Approval of the establishment of a correspondence group to develop wash water discharge criteria for exhaust gas SO_x cleaning systems;
- Agreement on a global standard on shore-power supply connections with ships, but agreed to await the finalization of such a standard before taking any decision on its possible inclusion in the revised MARPOL Annex VI, noting that the International Organization for Standardization (ISO) and the International Electro technical Commission (IEC) have established a working group on the standardization of on-shore power supply for ships at berth; and
- Agreement on the cooperation between the secretariats of the International Civil Organization (ICAO) and IMO should be strengthened and that developments related to GHG emissions in both Organizations should be communicated to each other.

Addressing Greenhouse Gases

MEPC agreed on a work plan and timetable, to identify and develop the mechanisms needed to achieve the limitation or reduction of carbon dioxide (CO₂) emissions from ships in order to address the growing concern of climate change caused by greenhouse gases (GHGs). The work plan includes the development of a CO₂ Emission Indexing Scheme. Member States and the industry were asked to carry out trials in accordance with the Interim Guidelines for Voluntary Ship CO₂ Emission indexing for In-Use Trials (MEPC/Cir. 471, issued in 2005); the consideration and evaluation of methodology for CO₂ emission baseline(s); and the consideration of technical, operational and market-based methods for dealing with GHG emissions. The timeline to accomplish the work under this work plan calls for completion by 2008/2009.



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2007

In April 2007, the IMO's Bulk Liquid and Gas Subcommittee held a meeting in London to discuss ocean/sea going vessel emission standards under Annex VI. The subcommittee noted that the contribution of ship emissions is greatly impacting air quality in many parts of the world and that emissions will continue to grow with the growth in global trade. In addition, the IMO noted that action is required to avoid proliferation of unilateral regional or national regulations.

Proposals from the meeting included:

- “Narrowing” of options on emission reduction strategies;
- Consolidate USA and BIMCO proposals into one “global/regional” option;
- INTERTANKO proposal – agreement on the use of distillate fuels as proposed or equivalent emission limits, allowing for LSFO or use of emission control technology(s);
- New engines – propose for Tier II engines 2 to 3.5 g/kWh reductions vs. 2011 standard and water or selective catalytic reduction technology based Tier III engines as of 2015 – 2016;
- Existing engines – bring to current standard;
- Efficient and effective instruments to address air pollution and climate change;
- Holistic approaches involving oil producers and engine manufacturers; and
- Inclusive approach engaging governments, industry and the scientific community.

ENGINE STANDARDS

Background

Ports around the world depend on the efficiency of the diesel engine to power port operations in each source category – ocean/sea-going vessels, harbor craft, cargo handling equipment, trucks and locomotives. Though diesel engines are the most efficient power sources compared to other internal combustion engines, they are significant contributors to air pollution. Environmental regulations are calling for cleaner engine standards and advanced emission controls to address the negative impact from diesel emissions.

The following fact sheet provides an overview on international engine emission standards. Emission standards are set requirements that limit the amount of pollutants that can be released into the atmosphere. There are emission standards set for both onroad and offroad vehicles and equipment. Generally, emission standards regulate emissions for oxides of nitrogen (NO_x), particulate matter (PM) or soot, carbon monoxide (CO), or volatile hydrocarbons (depends on international engine standard).