



June 27, 2011

**Re: MARPOL Annex VI Air Pollution Prevention Requirements**

Dear Shipowners, Ship Operators, Shipbuilders, Marine Diesel Engine Manufacturers, Marine Fuel Suppliers and any other interested groups:

This letter is to remind you of certain regulations for prevention of air pollution from ships. Annex VI to the International Convention for the Prevention of Pollution from Ships (MARPOL) has been effective in the United States (U.S.) since January 8, 2009. As of that date, all U.S. flagged vessels,<sup>1</sup> and non-U.S. flagged ships operating in U.S. waters, must comply with MARPOL Annex VI regulations. Some of the regulations are applicable only to ships of 400 gross tonnage and above<sup>2</sup> while other regulations are applicable to all ships. The regulations include requirements for engines and for the quality of fuel to be burned in those engines. Additionally, more stringent engine and fuel standards apply to ships operating in Emission Control Areas (ECAs) listed in MARPOL Annex VI.

The United States Environmental Protection Agency (EPA) and the United States Coast Guard (USCG) are taking measures to promote compliance with the regulations, including investigating potential violations and pursuing enforcement actions and related penalties for any violations.

**I. Annex VI as Implemented Through the Act to Prevent Pollution from Ships**

MARPOL Annex VI is implemented in the United States through the Act to Prevent Pollution from Ships (APPS).<sup>3</sup> Both Annex VI and APPS include provisions related to the certification of vessels and engines, operational requirements, fuels requirements, and record keeping requirements.

Annex VI includes progressively more stringent limits for both sulfur oxide (SO<sub>x</sub>) emissions, primarily through control of sulfur content in fuels, as well as progressively more stringent limits for nitrogen oxide (NO<sub>x</sub>) emissions. NO<sub>x</sub> emission standards can be found in Regulation 13 of Annex VI and in the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (NO<sub>x</sub> Technical Code). The sulfur limits for fuels can be found in Regulations 14 and 18 of Annex VI. U.S. regulations incorporate both the NO<sub>x</sub> standards and fuels provisions from Annex VI.<sup>4</sup>

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<sup>1</sup> U.S. flagged vessels are also subject to requirements of the U.S. Clean Air Act and its implementing regulations; however, the focus of this letter is on the international standards. More information on the Clean Air Act and its implementing regulations can be found on the EPA website at <http://www.epa.gov/otaq/oceanvessels.htm>. U.S. flagged vessels operating only domestically and in compliance with domestic exhaust emissions standards under the U.S. Clean Air Act are excluded by regulation from Annex VI NO<sub>x</sub> engine standards. See 40 C.F.R. § 1043.10(a)(2).

<sup>2</sup> U.S. flagged vessels of 400 Gross Tons (ITC) and above.

<sup>3</sup> 33 U.S.C. § 1901 *et seq.*

<sup>4</sup> 40 C.F.R. Part 1043 and Part 80, Subpart I.



The NO<sub>x</sub> emission standards and fuel sulfur limits are summarized in the tables below. Specifically, each marine diesel engine with a power output of more than 130 kW that is installed on a ship constructed on or after January 1, 2000, and each existing marine diesel engine with a power output of more than 130 kW that undergoes a major conversion<sup>5</sup> on or after January 1, 2000, must be operated in conformance with the Annex VI NO<sub>x</sub> emission limits. These standards apply to both main propulsion and auxiliary engines.

#### NO<sub>x</sub> Standard (g/kW-hr)

NO <sub>x</sub> Tier	Ship Build Date or Major Conversion	Maximum In-Use Engine Speed, <i>n</i>		
		Less than 130 RPM	130 to less than 2,000 RPM	2,000 or more RPM
Tier I	On or after Jan. 1, 2000 <sup>a</sup>	17.0	$45.0 \cdot n^{(-0.20)}$	9.8
Tier II	On or after Jan. 1, 2011	14.4	$44.0 \cdot n^{(-0.23)}$	7.7
Tier III <sup>b</sup>	On or after Jan. 1, 2016	3.4	$9.0 \cdot n^{(-0.20)}$	2.0

Notes: a. Starting October 6, 2011, existing diesel engines of more than 5,000 kW and a per cylinder displacement at or above 90 liters installed on a ship constructed between 1990 and January 1, 2000, may be required to meet the Tier I NO<sub>x</sub> standards (*i.e.*, via a Tier I NO<sub>x</sub> retrofit), subject to commercial availability of the necessary emission controls, even if the engines have not undergone a major conversion.<sup>6</sup>

b. Tier III standards apply when a ship is operating in an ECA. Outside an ECA, Tier II limits will apply.

#### Sulfur Standard in Fuel (max % by weight)

Global Sulfur Cap		ECA Sulfur Cap	
Prior to Jan. 1, 2012	4.50%	Prior to July 1, 2010	1.50%
On and after Jan. 1, 2012	3.50%	On and after July 1, 2010 <sup>d</sup>	1.00%
On and after Jan. 1, 2020	0.50% <sup>c</sup>	On and after Jan. 1, 2015	0.10%

Notes: c. Subject to feasibility review in 2018; may be delayed to 2025.

d. As discussed below, the North American ECA will become enforceable in August 2012.

In addition to NO<sub>x</sub> emissions and fuel sulfur limits, other requirements under Annex VI and APPS that may pertain to you include (but are not limited to):

**Engine International Air Pollution Prevention Certificates:** Starting on January 8, 2009, for U.S. flagged vessels built after January 1, 2000, an Engine International Air Pollution Prevention (EIAPP) certificate is required for each diesel engine having a power output greater than 130 kW to document that the engine meets Annex VI NO<sub>x</sub> standards. EIAPP certificates must be obtained before the first scheduled dry-docking of the vessel that

<sup>5</sup> A "major conversion" includes (1) a replacement of an existing engine or installation of an additional engine, (2) any substantial modification of an engine, or (3) an increased engine rating of more than 10%. MARPOL Annex VI, Regulation 13, Section 2.1.

<sup>6</sup> For more details, see

[http://www.imo.org/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Nitrogen-oxides-\(NOx\)-Regulation-13.aspx](http://www.imo.org/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Nitrogen-oxides-(NOx)-Regulation-13.aspx).



occurs after January 8, 2009, but no later than January 9, 2012. U.S. vessels built before January 1, 2000, having installed diesel engines greater than 130 kW that undergo a major conversion after January 1, 2000, are also subject to the NO<sub>x</sub> standards and must obtain an EIAPP certificate for those engines. Non-U.S. flagged ships built after January 1, 2000, are also required to have an EIAPP issued by the ship's flag Administration.<sup>7</sup>

Recordkeeping and Fuel Samples: Annex VI requires ship owners and operators to maintain on board the ship certain information and records, including EIAPP certificates; a technical file for each installed diesel engine that contains engine specifications for compliance with the NO<sub>x</sub> limits; and a record book of engine parameters for recording all changes and adjustments made relative to an engine's components and settings. Additionally, fuel suppliers must provide the ship with bunker delivery notes and representative samples of fuel oil delivered to the ship. Bunker delivery notes must be maintained on board for a minimum of three years, and the fuel oil representative sample must be maintained for a minimum of twelve months.

Surveys: Ships are subject to an initial survey prior to being put into service or prior to being issued an International Air Pollution Prevention (IAPP) certificate for the first time to ensure compliance with Annex VI. Renewal, intermediate, annual and additional surveys are performed periodically, as specified in Regulation 5 of Annex VI and the NO<sub>x</sub> Technical Code, to ensure ongoing compliance with the emission standards and other requirements of Annex VI.

## II. Emission Control Areas (ECAs)

Ships operating in designated ECAs are subject to more stringent emission standards and fuel requirements. The International Maritime Organization (IMO) has designated several ECAs under MARPOL Annex VI, including waters off North America extending up to 200 nautical miles from the United States and Canada, adjacent to the Pacific coast, the Atlantic/Gulf coast and the eight main Hawaiian Islands.<sup>8</sup> Allowing for the lead time associated with the IMO process, the North American ECA will become enforceable in August 2012.

More recently, the United States also submitted a proposal to IMO to designate an ECA off the coasts of Puerto Rico and the U.S. Virgin Islands. This U.S. Caribbean ECA was approved by the Marine Environment Protection Committee at IMO and will be considered for adoption in July of 2011. If the U.S. Caribbean ECA is adopted, the more strict ECA requirements would be effective as early as January 2014.

As summarized in the tables above, beginning in 2015, fuel used by all ships operating in ECAs cannot exceed 0.1 % fuel sulfur (1,000 ppm).<sup>9</sup> Beginning in 2016, new engines on ships operating in ECAs must use emission controls that achieve an 80 % reduction in NO<sub>x</sub> emissions.

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<sup>7</sup> Ships that are registered in countries that are not parties to MARPOL Annex VI are not required to have EIAPP certificates but the operator must have evidence of conformity with the Annex VI NO<sub>x</sub> standards issued by either a government of a country that is a party to Annex VI or a recognized classification society. 40 C.F.R. § 1043.30(c)(4).

<sup>8</sup> A complete list of ECAs can be found at:

<http://www.imo.org/ourwork/environment/pollutionprevention/specialareasundermarpol/Pages/Default.aspx>.

<sup>9</sup> As an alternative to using low sulfur fuel, ship operators may meet the requirements by equipping their ships with exhaust gas cleaning systems and other alternative technologies.



Thus, determining and recording the position of a vessel will be a critical part of ensuring compliance with the ECA provisions.

### III. Enforcement

Violations of MARPOL Annex VI, APPS, or any implementing regulation may result in criminal or civil liability. U.S. flagged vessels are subject to inspection for compliance with MARPOL Annex VI. Similarly, non-U.S. flagged ships are subject to examination under Port State Control while operating in U.S. waters. If an examination of a non-U.S. flagged ship indicates a violation of MARPOL Annex VI, the USCG has the authority under APPS to detain the ship. Furthermore, the USCG or EPA may bring an enforcement action for a violation. Persons found to have violated MARPOL Annex VI, APPS, or any implementing regulation may be liable for a civil penalty up to \$25,000 for each violation, and each day of a continuing violation may constitute a separate offense. APPS also provides for criminal liability for knowing violations of MARPOL.

We are interested in understanding how shipowners and ship operators plan to comply with the ECA requirements. You are encouraged to discuss your compliance plans with EPA and the USCG by contacting us at:

#### USCG Compliance

Commandant (CG-543)  
US Coast Guard  
2100 2nd St., S.W., Stop 7581  
Washington, DC 20593-7581  
USA

Lieutenant Commander Steven Keel  
Office of Vessel Activities (CG-543)  
Telephone: +1 (202) 372-1251  
E-mail: CG-543@uscg.mil

#### EPA Compliance

USEPA Headquarters  
Ariel Rios Building  
1200 Pennsylvania Ave., N.W.,  
Mail Code 6405J  
Washington, DC 20460  
USA

Mr. Karl Simon  
Director, Compliance & Innovative Strategies  
Division  
Telephone: +1 (202) 343-9626  
E-mail: simon.karl@epa.gov

If you have questions regarding enforcement, you can contact us at:

#### USCG Enforcement

Commandant (CG-545)  
US Coast Guard  
2100 2nd St., S.W., Stop 7581  
Washington, DC 20593-7581  
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#### EPA Enforcement

USEPA Headquarters  
Ariel Rios Building  
1200 Pennsylvania Ave., N.W.  
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Washington, DC 20460  
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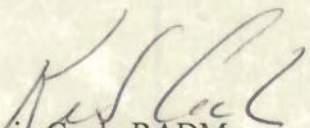
Mr. Phillip Brooks  
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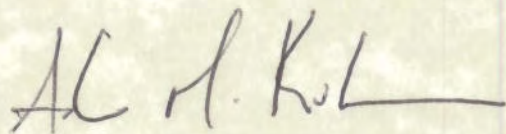
**Note: This letter is intended to be only a brief summary of some of the main provisions and requirements of MARPOL Annex VI.**

More detailed information on the MARPOL Annex VI requirements is available on the EPA website at <http://www.epa.gov/otaq/oceanvessels.htm> or on the USCG website at <http://homeport.uscg.mil> then select *Domestic Vessels* then *Domestic Vessel General* then select *MARPOL Annex VI*. There you will find a USCG policy letter (CG-543 Policy Letter 09-01) containing guidelines for ensuring compliance with MARPOL Annex VI.

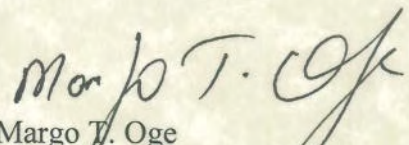
Yours very truly,



Kevin Cook, RADM  
Director of Prevention Policy  
U.S. Coast Guard



Adam M. Kushner  
Director, Office of Civil Enforcement  
Office of Enforcement and Compliance Assurance  
U.S. Environmental Protection Agency



Margo T. Oge  
Director, Office of Transportation and Air Quality  
Office of Air and Radiation  
U.S. Environmental Protection Agency