

# EMISSION STANDARDS: SO<sub>x</sub>/NO<sub>x</sub>

## Summary of current MARPOL limits

	Outside ECAs	Within ECAs
SO <sub>x</sub>	3.5% <sub>m/m</sub> (since 1/01/2012)	1.0% <sub>m/m</sub> since 01/07/2010 (0.1% on and after 01/01/2015)
NO <sub>x</sub>	Three Tier Scheme	Tier III (Only for North America ECA and US Caribbean Sea ECA)

## United States



### Areas

- North America Emission Control Area: on 26th March 2010 IMO designated as an ECA, waters off the North American coasts.
- US Caribbean Emission Control Area: on 15th July 2011 IMO designated as an ECA, waters off the coasts of Puerto Rico and the US Virgin Islands by ECA amendments MEPC.202(62)

For this area, the effective date of the first phase fuel sulphur standard (1%) is 2014 and the second phase (0.1%) begins in 2015. Stringent NO<sub>x</sub> engine standards begin in 2016 (Tier III).

Steamships operating in the North American and USA Caribbean Sea ECAs are exempted from compliance with the Regulation 14 (SO<sub>x</sub>) through 31/12/2014.

- Great Lakes: Vessels which operate within and outside the Great Lakes must comply with the provisions of 40 CFR 1043.

Great Lakes Vessels (vessels operating exclusively in the Great Lakes, both US and foreign flagged) may be exempted by EPA according to a separate waiver under interim provisions described in 40 CFR 1043.95 (c) if no acceptable fuel is available.

Steamships operating on the Great Lakes are subject to a separate waiver under 40 CFR 1043.95 (a) when they

were propelled by steam engines and operated within the Great Lakes before 30th October 2009 and operate exclusively within the Great Lakes.

- The convenience of the designation of new ECA areas such as Pacific US territories, smaller Hawaiian Islands and Western Alaska is currently being examined.

### California

The California Ocean-Going Vessel (OGV) Fuel regulation limited the maximum fuel sulphur for both marine gas oil (DMA) and marine diesel oil (DMB) to 0.1% <sub>m/m</sub>. Therefore, vessels visiting California ports have to comply with both the California OGV Fuel Regulation and the North American Emission area.

Besides, the California OGV Fuel Regulation encompasses a non-compliance Fee Provision by which if a vessel is unable to find a compliant fuel, a fee may be paid instead.

These requirements set in the California OGV Fuel Regulation won't apply if the US adopts and enforces requirements that achieve equivalent emissions reductions. Furthermore, the California Air Resources Board will allow the use of alternative emissions control technologies such as exhaust gas cleaning devices as stated under the ECA Regulation. ■

### Federal law

#### Regulations

- The Act to Prevent Pollution from Ships (APPS): Annex VI of MARPOL is enacted in the US by APPS. The EPA has the authority to enforce Annex VI with the cooperation of USCG (through the ship inspections, examinations and investigations) Code of Federal Regulations. Title 40 – Protection of Environment. Part 1043 Control of NO<sub>x</sub>, SO<sub>x</sub> and PM Emissions from marine Engines and Vessels subject to the MARPOL Protocol.
- The Clean Air Act
- The Final Rule published on April 30, 2010: extends the ECA to the internal waters.

## Canada

Regulations for Vessel Air Emissions apply to vessels over 400 gross tonnage operating in Canada.

### Regulations

- Some requirements are in place under Vessel Pollution and Dangerous Chemicals Regulations (The Regulations)
- New implementations are now in place under The Regulations Amending the Vessel Pollution and Dangerous Chemicals Regulations (The Amendments) published 8/05/2013

### Emissions Standards

- Sulphur Oxides = Marpol



I) For Vessels inside the NA-ECA and throughout Canadian waters south of 60°N, the current limit (since 1/07/2010) is 1% but it will be 0.10% after 1/01/2015.

II) For Vessels outside the NA-ECA, north of 60°N and including Hudson's Bay, James Bay and Ungava Bay, the current limit is 3.50% (since 1/01/2012) but it will be 0.50% after 1/01/2020

- Nitrogen Oxides = Marpol (Annex VI + NO<sub>x</sub> Technical Code 2008)  
The NO<sub>x</sub> limits apply to engines installed on vessels that have power ratings over 130 kilowatts as described in table below.

If a vessel undergoes a major conversion or a new engine, substantially different from the old one, is installed the current standard would apply. ■

Tier I	Tier II	Tier III
Engines installed on vessels built between December 31, 1999 to December 31, 2010	Engines installed on vessels built after December 31, 2010	Engines installed on vessels built after January 1, 2016, that operate in ECAs
17.0 g/kWh when n is less than 130 rpm; 45 · n(-0.2) g/kWh when n is 130 or more but less than 2,000 rpm; 9.8 g/kWh when n is 2,000	14.4 g/kWh when n is less than 130 rpm; 44 · n(-0.23) g/kWh when n is 130 or more but less than 2,000 rpm; 7.7 g/kWh when n is	3.4 g/kWh when n is less than 130 rpm; 9 · n(-0.2) g/kWh when n is 130 or more but less than 2,000 rpm; and 2.0 g/kWh when n is

## China

### Regulations

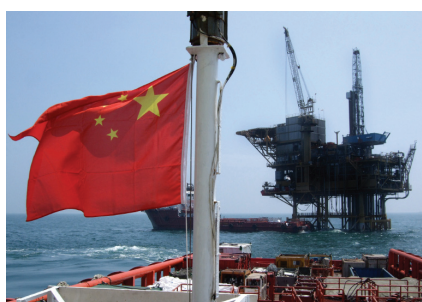
- Country Party Annex VI Marpol
- No Specific provisions regulating emissions from ships.

### Air Pollution

- Air Pollution Control Ordinance 10/04/2014
- Air Pollution Control (Marine Light Diesel) Regulation 01/04/2014 introduces a new sulphur content cap of 0.05% for the locally supplied marine light diesel (MLD).

### Hong Kong

Hong Kong Environmental Protection Department has required all ocean-going vessels (OGVs) to use low sulphur fuel,



defined in the new legislation as fuel with sulphur content not exceeding 0.5% by weight, when at berth in Hong Kong waters. All OGVs must initiate fuel switch upon arrival at berth, complete the switch to low sulphur fuel within one hour, then use low sulphur fuel throughout the berthing period

until one hour after departure.

Hong Kong government has declared its long-term intention to set up an Emissions Control Area for ships in the Pearl River Delta.

Meanwhile, since 2011 vessels have been participating in an industry-led scheme (Far Winds Charter) by which they switch voluntarily to low sulphur fuel (0.5% sulphur content or less) when at-berth in Hong Kong until December 2014. 17 major freight liners have signed up to this initiative: Maersk Line, Evergreen, OOCL, Yang Ming (Taiwan), APL, CMA CGM, COSCO, MOL, Hapag Lloyd, Hanjin, Hyundai, NYK, Hamburg Sud, Alianca, Hoegh, Crystal Cruises, Prestige Cruise Holdings. ■

## Australia



### Regulations

- Australia: Country Party MARPOL Annex VI

### Summary of Discharge Standards for Ships and smaller vessels operating in Australian waters: MARPOL and local requirements (This table applies to all vessels)

Vessel/Voyage type/Area	Sub-Category	Discharge Conditions
All vessels	Ozone-depleting substances	<ul style="list-style-type: none"> <li>▪ Prohibited</li> </ul>
	Nitrogen Oxides	<ul style="list-style-type: none"> <li>▪ Operation of diesel engines &gt;130kW prohibited unless engine is certified to meet prescribed emission standards.</li> <li>▪ New Engines:                             <ul style="list-style-type: none"> <li>▪ Tier I – 17 g/kW from 1 January 2000</li> <li>▪ Tier II – 14.4 g/kW from 1 January 2011</li> <li>▪ Tier III – 3.4 g/kW from 1 January 2016 (in Emission Control Areas (ECA))</li> </ul> </li> <li>Existing Engines (installed on ship on or between 1 January 1990 to 1 January 2000)                             <ul style="list-style-type: none"> <li>▪ 17g/kW for diesel engine with power output &gt;5000kW and displacement per cylinder =&gt; 90 litres</li> <li>▪ Approved method by Administration</li> </ul> </li> </ul>
	Sulphur Oxides	<ul style="list-style-type: none"> <li>▪ Sulphur content of fuel oil not to exceed 4.5%**</li> <li>▪ From 1 January 2012, sulphur content of fuel oil not to exceed 3.5%**</li> <li>▪ From 1 January 2020 sulphur content if fuel oil not to exceed 0.5%**</li> </ul> <p>** Fuel oil to be purchased from a registered supplier Note: Feasibility review to be completed 2018</p>
	Incinerators	<ul style="list-style-type: none"> <li>▪ Incinerators installed after 1 January 2000 must be type approved and certified to meet prescribed emission standards.</li> <li>▪ Do not use within port limits</li> </ul>

Source: Amsa

## Turkey



### Regulations

- Country Party MARPOL Annex VI

### Specific Requirements

Since the 1st January 2012, new regulations on sulphur content limits of marine fuels are in place:

- Sulphur content in marine fuels shall not exceed 0.1% by mass in all vessels arriving at Turkish ports and all inland waterway vessels sailing on Turkish inland waters.

- Sulphur content in marine fuels shall not exceed 1.5% in all passenger vessels providing regular services in areas covered by Turkey's marine jurisdiction.

These limitations apply to berthed or anchored Ships within the boundaries of any port and staying at berth or at anchor for more than two hours. However, they won't apply to vessels passing the Turkish Straits without calling to any Turkish Port, if their transiting process does not exceed two hours. ■

### Summary of EU Directive Current SO<sub>x</sub> limits

	Outside ECAs	Within ECAs
All Ships	3.5% <sub>m/m</sub> (since 18/06/2014) (0.50% from 01/01/2020)	1.0% <sub>m/m</sub> (Until 31/12/2014) (0.1% on and after 01/01/2015)
Passenger Ships	1.5% until 01/01/2020 (0.50% from 1/01/2020)	1% (until 31/12/2014) (0.10% from 01/01/2015)
Ships at berth in EU ports		0.1% (since 01/01/2010)

## France



French Transport Code, Article L 1431-3 comprises a new CO<sub>2</sub> reporting requirement by which foreign shipowners need to provide information to their French customers, either cargo interests or passengers, of the mass of

CO<sub>2</sub> when calling at French Ports.

The mass of emitted CO<sub>2</sub> is calculated by multiplying the fuel consumed during the voyage with the relevant emission factors published by the French Authorities. The emission factors provide the quantity of CO<sub>2</sub> produced in kilograms for both the "operating phase" and the "upstream phase" for each kilogram of fuel used (fuel oil, diesel, LNG and LPG). The total quantity is expressed as a mass in either grams (g), kilograms (kg) or tonnes (t) of CO<sub>2</sub> corresponding to the actual service provided to cargo interests or passengers respectively.

In terms of goods, the provision of

this information to cargo interests may be given either prior to or after the voyage depending on the agreement between the parties, but in any event must be provided within two months of the voyage being completed.

For passengers, the information must be provided prior to the ticket being purchased, or if no ticket is issued, no later than completion of the passenger's voyage.

North America control Area comprises the French islands: Saint Pierre and Miquelon archipelago, therefore the more stringent limits applied to them. ■

### Finland

Finland is preparing stricter provisions on sulphur emissions from shipping to come into force by the beginning of 2015.

Finnish Transport Safety Agency (Trafi), the Finnish Border Guard and the police will all monitor emissions from shipping. The price difference between high- and low-sulphur fuels – gains are considered as ‘illegal financial gains’ therefore, the violators must forfeit to the government.

Such penalties are considered more

tangible than fines or other punishments and would also apply to shipping companies.

The cost impact of such a measure will only be known after the provisions come into force and when the price of low-sulphur fuel becomes clear.

Trafi has estimated that if ships use only low-sulphur fuel, the provisions will increase Finland’s maritime transport costs by around €460 million/year, and by €120 million/year if scrubbers are installed in ships. ■

