



# Frequently Asked Questions

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## MARPOL 73/78 Annex VI Marine Diesel Engine Requirements

*The U.S. Environmental Protection Agency (EPA) is issuing this fact sheet to advise owners and operators of marine vessels flagged, registered, or primarily used in the United States of the marine diesel engine requirements contained in Annex VI to the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78). The International Maritime Organization adopted this Annex on September 27, 1997.*

### **Who should read this fact sheet?**

Anyone who owns, or might purchase or construct, a commercial or recreational marine vessel with one or more marine diesel engines rated above 130 kilowatts (kW) (175 horsepower) should read this fact sheet. The Annex applies only to these engines.

### **If Annex VI has not entered into force internationally, do I still need a compliant engine?**

Annex VI will enter into force internationally one year after it is ratified by at least 15 countries representing 50 percent of the gross tonnage of the world's merchant shipping. Until that time, however, you should still make sure any new engine you purchase or any existing engine you modify beginning January 1, 2000, complies with the Annex VI limits for oxides of nitrogen (NO<sub>x</sub>). This is because after the Annex goes into force internationally, it may be enforceable back to engines newly installed or converted on or after that date. The actual effective date for U.S.-flagged vessels will be decided as part of the U.S. ratification process.

EPA has set up a voluntary certification program so engine manufacturers can show that they have compliant engines. EPA expects that all new marine diesel engines with a power output of more than 130 kW sold in

the United States beginning January 1, 2000, will comply with the MARPOL Annex VI NOx limits.

**I never take my vessel to foreign ports. Do the Annex VI requirements still apply to me?**

Until the U.S. national program for marine diesel engines starts, the Annex VI NOx control program will be voluntary for engines installed on U.S.-flagged vessels that do not go to foreign ports. This means that engine manufacturers are encouraged to make Annex VI compliant engines available, and you are encouraged to purchase them when you buy new engines for a new vessel.

However, the requirements of the Annex may apply to your vessel once the Annex goes into force for the United States. The applicability of the Annex to U.S.-flagged vessels built on or after January 1, 2000, but prior to date the Annex goes into force internationally, will be decided as part of the U.S. ratification process. You can obtain more information about the status of the U.S. national program and other requirements of the Annex by contacting the individual listed at the end of this fact sheet.

## **The MARPOL Annex VI Requirements**

**What is MARPOL 73/78?**

MARPOL 73/78 is the International Convention for the Prevention of Pollution from Ships. This international treaty was originally adopted by the International Maritime Organization (IMO) in 1973 and revised in 1978. Its goal is to reduce pollution from all aspects of marine vessel operation. To achieve this goal, the Treaty and its Annexes contain requirements to control the accidental or deliberate discharge of substances such as oil, chemicals, and garbage. It also sets incineration requirements.

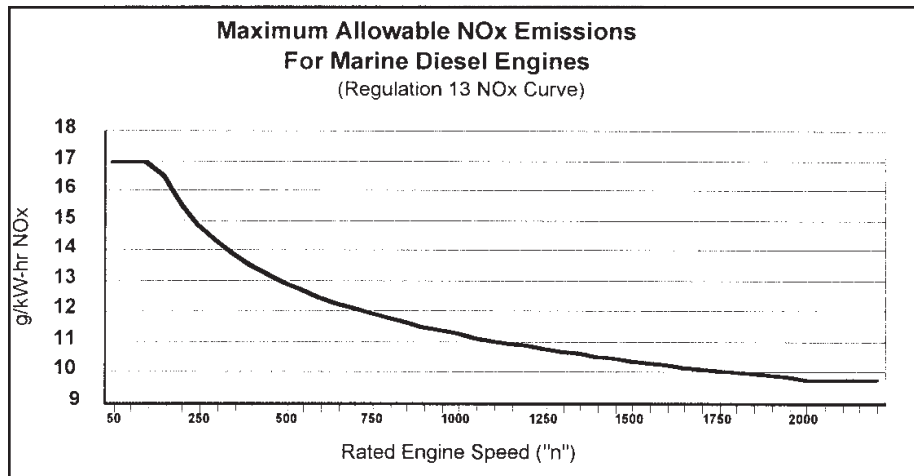
**What is Annex VI?**

Annex VI, adopted by the Parties to MARPOL in 1997, limits air pollution from ships. These provisions affect ozone-depleting substances, NOx, sulfur oxides (SOx), volatile organic compounds (VOCs), ship-board incineration, reception facilities, and fuel oil quality.

**What are the Annex VI NOx requirements?**

The Annex VI NOx requirements are found in Regulation 13, which sets emission limits for marine diesel engines rated above 130 kW. These limits (given in grams per kilowatt-hour) are based on a curve (the NOx curve), which is described by the following formula that varies with rated engine speed (n in crankcase revolutions per minute):

- 17 g/kW-hr for  $n < 130$  rpm
- $45.0 \times n^{(-0.2)}$  g/kW-hr for  $130 \leq n < 2000$  rpm
- 9.8 g/kW-hr for  $n \geq 2000$  rpm



**Do the Annex VI NOx limits apply only to new marine diesel engines?**

The Annex VI NOx limits apply to new marine diesel engines and, in some cases, to existing engines. The Annex specifies that any new engine installed on a vessel constructed on or after January 1, 2000, must comply with the Annex VI NOx limits. Any existing engine that undergoes a major conversion on or after January 1, 2000, must also comply with the Annex VI NOx limits, no matter when that engine was originally manufactured.

*Major conversion* means:

- (1) the engine is replaced by a new engine built on or after January 1, 2000; or
- (2) the engine is substantially modified in any way that may increase NOx emissions; or
- (3) the maximum continuous rating of the engine is increased by more than 10 percent.

### **Demonstrating Compliance**

The engine manufacturer will demonstrate that a new engine complies with the MARPOL Annex VI NOx limits. The manufacturer will provide test data and other information to EPA. After receiving this information, we will issue one of two documents:

**I am buying a new marine diesel engine. How do I know if this engine complies with the Annex VI NOx limits?**

- Statement of Voluntary Compliance—issued prior to entry into force of the Annex; or
- Engine International Air Pollution Prevention Certificate (EIAPP) – issued after entry into force of the Annex.

You should receive a copy of one of these documents, as well as the Technical File when you receive the engine. These are very important documents; if you take your vessel to foreign ports, you must keep them onboard the vessel at all times. They are described in greater detail below.

**I am having my engine overhauled. Do I need to make sure the modified engine complies with the Annex VI NOx limits and, if so, how do I do this?**

Whether or not you must have your overhauled engine certified to the MARPOL Annex VI NOx limits depends on how you use your vessel and the type of overhaul.

Vessel Application. Your engine will be exempt from the MARPOL Annex VI engine overhaul requirements if you never take your vessel to a foreign port. However, your engine will be subject to the rebuild, remanufacturing, and replacement provisions in the national marine diesel rule after that rule goes into effect.

Type of Overhaul. If your engine meets the criteria for major conversion described above and it is overhauled on or after January 1, 2000, it must comply with the Annex VI NOx limits.

To demonstrate compliance:

- You should insist that the company making the modification certify that the modified engine complies with the NOx limits. To do this, the company making the modification will submit emissions data or other information to EPA. EPA will then issue a revised Statement of Voluntary Compliance or EIAPP for that engine.
- If you are doing the overhaul yourself, you should contact EPA ahead of time to find out what kind of information and data you will need to send EPA to demonstrate that your modified engine complies with the Annex VI NOx limits.

## **Requirements for U.S.-Flagged Vessels That Go to Foreign Ports**

**I operate my U.S.-flagged vessel internationally. Which emission limits do my engines have to meet after the U.S. national program goes into effect?**

After the U.S. national program goes into effect, your engines must meet the national emission limits. You may apply for a waiver from the domestic program if your vessel meets certain criteria. The contact listed at the end of this fact sheet can help you determine if you qualify for a waiver.

**If I do not qualify for a waiver and my engines must meet the domestic emission limits, am I still affected by MARPOL Annex VI?**

Yes. If you take your vessel to foreign ports, you must comply with the provisions of MARPOL Annex VI after it goes into force internationally.

**If I do not qualify for a waiver and my engines must meet the domestic emission limits, how will I demonstrate compliance with MARPOL?**

Demonstrating compliance will be the same as for the Annex VI limits. The engine manufacturer must demonstrate that a new engine complies with the U.S. emission limits and obtain either a Statement of Voluntary Compliance or an EIAPP from EPA. You should receive a copy of one of these documents, as well as the Technical File, when you receive the engine. These are very important documents; if you take your vessel to foreign ports, you must keep them onboard the vessel at all times. They are described in greater detail below.

## **MARPOL Annex VI Survey and Inspection Requirements**

**What are the MARPOL Annex VI surveys?**

The MARPOL Annex VI surveys are a set of inspections to ensure that your vessel and engine comply with the Annex requirements. In the United States, the Coast Guard will typically conduct these inspections. In foreign ports, the inspections will be done by the Administration of that country or a delegated authority.

**Which vessels will be subject to MARPOL Annex VI surveys?**

Annex VI survey requirements apply to ships of 400 gross tonnage or above and fixed and floating drilling rigs and other platforms. Surveys will cover all aspects of Annex VI requirements, not just engine NOx emissions.

**Will vessels and engines be surveyed before Annex VI goes into force internationally?**

A country may decide to require inspections and surveys after it ratifies the Annex. Before the Annex goes into force for that country, however, it is not clear if countries will do this. If your vessel is larger than 400 gross tons, you should consult with the U.S. Coast Guard about survey and inspection requirements prior to entry into force of the Annex.

**When will ships be surveyed?**

Annex VI contains a schedule of surveys that occur throughout the life of a vessel. These include:

- Initial survey: This survey occurs before the ship is put into service or before a vessel certificate is issued for the first time.

This survey ensures that the equipment, systems, fitting, arrangements and material used onboard fully comply with the requirements of Annex VI. The vessel's International Air Pollution Prevention certificate (IAPP) will be issued to the vessel by the U.S. Coast Guard, or an organization authorized to act on its behalf, after this survey.

- Periodic surveys: These surveys occur at least every five years after the initial survey. These surveys confirm that nothing has been done to the ship's equipment that would take it out of compliance. The vessel's IAPP certificate will be re-issued by the U.S. Coast Guard, or an organization authorized to act on its behalf, after this survey.
- Intermediate surveys: These surveys occur at least once during the period between issuance of an IAPP and the periodic surveys. They also confirm that all of the ship's equipment remains in compliance.

**When will engines be surveyed?**

Engine surveys are described in Chapter 2 of the NOx Technical Code, a supporting document to Annex VI. There are four kinds of engine surveys:

- Pre-certification survey: This survey occurs before an engine is installed onboard a vessel, to ensure the engine meets the NOx limits. The Engine International Air Pollution Prevention certificate (EIAPP) is issued by EPA after this survey for each applicable engine, engine family, or engine group.
- Initial certification survey: This survey occurs after the engine is installed onboard the ship, but before the ship is placed into service. It ensures that the engine meets the NOx limits as installed.
  - If an engine has an EIAPP, the initial certification survey will primarily ensure that any modifications to the engine's settings are within the allowable adjustment limits specified in the EIAPP.
  - Some engines are uniquely built or are so large that they cannot be tested on a test bed. The initial certification survey will be more comprehensive for these engines, since they have no prior test results.
- Periodic and intermediate surveys: These surveys occur as part of the ship's surveys described above. They ensure that the engine continues to comply fully with the NOx limits.

- Modification survey: This survey occurs when an engine overhaul meets the criteria for a major conversion. It ensures that the modified engine complies with the NOx limits.

**Are there record keeping requirements to simplify these surveys?**

There are three documents that are essential for completing the engine and vessel surveys. These are the EIAPP or Statement of Compliance, the Technical File, and the Record Book of Engine Parameters. These are described below.

### **Definition of Basic MARPOL Terms**

**What is an IAPP?**

The International Air Pollution Prevention certificate (IAPP) is issued to the vessel by the U.S. Coast Guard, or an organization authorized to act on its behalf, after the owner demonstrates that the vessel complies with all relevant requirements under MARPOL Annex VI. The IAPP is valid for five years, and is subject to successful completion of the vessel surveys described above. These certificates will not be issued until the Annex enters into force under Article 15 of the MARPOL Convention.

**What is an EIAPP?**

The Engine International Air Pollution Prevention certificate (EIAPP) is issued by the EPA for each applicable engine, engine family, or engine group after the engine manufacturer demonstrates that the engine complies with the NOx limits set out in Regulation 13 of Annex VI. The EIAPP is good for the life of the engine or until it undergoes a major conversion. These certificates will not be issued until the Annex enters into force under Article 15 of the MARPOL Convention.

**What is a Statement of Voluntary Compliance?**

The Statement of Voluntary Compliance is a document issued by EPA prior to entry into force of the Annex, after the engine manufacturer demonstrates that the engine complies with the NOx limits set out in Regulation 13 of Annex VI. Once the Annex goes into force, this statement must be exchanged for an EIAPP.

**What is the Technical File?**

The Technical File is a record containing all details of parameters, including components and settings, that may influence the NOx emissions of the engine. According to the NOx Technical Code, the Technical File must contain the following information:

- identification of those components, settings and operating values of the engine that influence its NOx emissions
- identification of the full range of allowable adjustments or alternatives for the components of the engine



- the full record of the engine's performance, including the engine's rated speed and rated power
- a system of onboard NOx verification procedures to verify compliance with the NOx emission limits during onboard verification surveys
- a copy of the emission test report used to certify the engine
- if applicable, the designation and restrictions for an engine that is a member of an engine group or engine family
- spare part component specifications, to ensure continued compliance of the engine with the NOx emission limits when these components are replaced
- the EIAPP or Statement of Voluntary Compliance

The Technical File contains essential information that will be used in an engine inspection or survey. You must keep it onboard the vessel at all times.

**What is The Record Book of Engine Parameters?**

The Record Book of Engine Parameters is a document for recording all parameter changes, including components and engine settings, that may influence NOx emissions. This is another essential document for surveys and inspections because it contains a record of adjustments to the engine. In some cases, a survey will consist simply of examining the Record Book to ensure that no changes have been made to the engine that might affect NOx emissions.

Vessel owners must make sure the Record Book is always accurate. If the settings on the engine do not match those in the record book, an engine survey may include a more time-consuming investigation and, potentially, onboard measurement of NOx emissions.

**For More Information**

Copies of MARPOL Annex VI and the NOx Technical Code are available on the Office of Mobile Sources' marine web site at:

[www.epa.gov/oms/marine.htm](http://www.epa.gov/oms/marine.htm)

For further information about these programs or to find a Coast Guard representative, please contact Jean Marie Revelt at:

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