

which it was based no longer apply. Specifically, we have learned that many spare engine parts are kept onboard vessels to enable ship operators to perform maintenance and repairs while the ship is underway. In addition, obtaining parts that are not kept onboard is not expected to be a problem. Modern package delivery systems allow ship owners to obtain parts quickly, even overnight, and necessary parts can be shipped to the next convenient port on a ship's route. In the unlikely case that an engine fails catastrophically and must be replaced by a compliant engine, we are confident that the ship operator will be able to make arrangements to obtain a certified engine, since the major manufacturers of marine diesel engines operate abroad as well as in the United States. Because the burden associated with repairing or replacing engines away from the United States is not significant, we believe it is appropriate to eliminate the exemption. We do not expect this change to have any impact on shipowners and operators.

III. Standards and Technological Feasibility

The emission standards we are adopting reflect a two-step approach. The first step involves near-term standards designed to be achievable immediately without additional research and development. This section presents these Tier 1 standards and the technologies that will be used to achieve them. The second step consists of a set of long-term standards, discussed in Section IV.

A. What Are the New Emission Standards?

We are adopting standards for marine diesel engines that are equivalent to the internationally negotiated NO_x standards, beginning in 2004. These standards, which are presented in Table III.A-1, apply to marine diesel engines with per-cylinder displacement over 2.5 liters. By adopting these standards, we are making them enforceable under U.S. law for engines on vessels flagged or registered in the United States, regardless of whether Annex VI has entered into force or whether the United States has deposited its instrument of ratification to MARPOL Annex VI.

TABLE III.A-1.—NO_x EMISSION STANDARDS
[g/kW-hr]

Engine Speed (n)		
n ≥ 2000 rpm	2000 > n ≥ 130 rpm	n < 130 rpm
9.8	45.0 × n ^{-0.2}	17.0

As described in Section V, we will accept emission data for certification to the near-term standards based on testing with either distillate or residual fuel. Because most or all manufacturers have been using distillate fuel to comply with Annex VI requirements, we expect manufacturers to meet the near-term standards generally by submitting their available emission data from testing with distillate fuels.

For marine diesel engines with per-cylinder displacement between 2.5 and 30 liters, these standards apply from 2004 to 2006, after which the EPA Tier 2 marine engine emission standards established in December 1999 apply (64 FR 73300, December 29, 1999). Testing to show compliance for these engines is generally based on emission measurements with distillate fuels meeting the specifications in 40 CFR 94.108.

We are not adopting the internationally negotiated standards for engines under 2.5 liters per cylinder. This is because our Tier 2 standards for most of those engines are effective in 2004. Marine diesel engines below 0.9 liters per cylinder need not meet EPA emission standards until 2005, but most of those engines are under 130 kW and are therefore not subject to Annex VI standards.

In the December 1999 final rule, we included a requirement to measure or prevent crankcase emissions. We have clarified in the final regulations that this applies only for engines subject to Tier 2 standards. As a result, none of the emission standards in this final rule include requirements related to crankcase emissions.

B. When Do the Engine Emission Standards Apply?

Adopting emission standards for new Category 3 marine engines starting in 2004 allows less than the usual lead time for meeting EPA requirements. We note, however, that manufacturers are generally already meeting the internationally negotiated standards, which apply to engines installed on vessels built on or after January 1, 2000. The near-term standards will require no additional development, design, or testing beyond what manufacturers are

already doing to meet the internationally negotiated Annex VI NO_x standards.

Engine manufacturers will need to comply with emission standards for all engines produced after January 1, 2004. For Category 1 and Category 2 engines, the date of manufacture is the date of the final assembly of the engine. However, we recognize that Category 3 engines are often disassembled for shipment to the site at which it is installed in the ship. Therefore, for Category 3 engines, the date of manufacture is based on the first full assembly of the engine.

Shipbuilders and owners are not required to certify their vessels under the program we are adopting in this action. However, shipbuilders are prohibited from selling vessels with noncompliant engines if they initiate construction of a vessel after the date that regulations begin to apply.

C. What Technologies Will Engine Manufacturers Use To Meet the Tier 1 Emission Standards?

The near-term Tier 1 standards are interim standards. They are intended to ensure that Category 3 engines achieve the greatest reductions achievable in this time frame, until the more stringent long-term standards we adopt go into effect. The short lead time associated with these interim standards means they call for the use of engine technologies that already have been or can be applied immediately, with little or no lead time.

The Tier 1 standards are achievable immediately because engine manufacturers are already producing engines that meet these standards. The short lead time involved in meeting Tier 1 standards by January 2004 allows manufacturers only enough time to work through this program's compliance requirements and do all the testing and paperwork required to complete the certification process.

Setting Tier 1 standards that are more stringent than the internationally negotiated NO_x standards (for example, one requiring further development and optimization of in-cylinder controls), would require more lead time to allow engine manufacturers to develop and to optimize existing in-cylinder technologies and apply them to these engines. Moreover, as discussed in Section I.C, adopting an emission standard now that is based only on in-cylinder control technologies would likely delay the adoption of future more stringent emission standards that may be based on optimized in-cylinder controls in combination with advanced technologies such as SCR or water injection.