

diagnostic radiopharmaceutical by radiation dosimetry evaluations in humans and appropriate animal models. Such an evaluation must consider dosimetry to the total body, to specific organs or tissues, and, as appropriate, to target organs or target tissues. The maximum tolerated dose need not be established.

Dated: April 15, 1998.

William B. Schultz,

Deputy Commissioner for Policy.

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 89

[FRL-6014-4]

RIN 2060-AH65

Control of Emissions of Air Pollution from New CI Marine Engines at or Above 37 Kilowatts

AGENCY: Environmental Protection Agency (EPA).

ACTION: Advance notice of proposed rulemaking.

SUMMARY: EPA is issuing this Advance Notice of Proposed Rulemaking (ANPRM) to invite comment from all interested parties on EPA's plans to propose emission standards and other related provisions for new propulsion and auxiliary marine compression-ignition (CI) engines at or above 37 kilowatts (kW). This action supplements an earlier action for these engines initiated as part of an overall control strategy for new spark-ignition (SI) and CI marine engines (Notice of Proposed Rulemaking (NPRM) published November 9, 1994, modified in a Supplemental Notice of Proposed Rulemaking (SNPRM) published at February 7, 1996). The engines covered by today's action are used for propulsion and auxiliary power on both commercial and recreational vessels for a wide variety of applications including, but not limited to, barges, tugs, fishing vessels, ferries, runabouts, and cabin cruisers. This document does not address diesel marine engines rated under 37 kW, which are included in a proposed rulemaking for land-based nonroad CI engines published at September 24, 1997.

DATES: EPA requests comment on this ANPRM no later than June 22, 1998. Should a commenter miss the requested deadline, EPA will try to consider any comments received prior to publication

of the NPRM that is expected to follow this ANPRM. There will also be opportunity for oral and written comment when EPA publishes the NPRM.

ADDRESSES: Materials relevant to this action are contained in Public Docket A-97-50, located at room M-1500, Waterside Mall (ground floor), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, DC 20460. The docket may be inspected from 8:00 a.m. until 5:30 p.m., Monday through Friday. A reasonable fee may be charged by EPA for copying docket materials.

Comments on this notice should be sent to Public Docket A-97-50 at the above address. EPA requests that a copy of comments also be sent to Jean Marie Revelt, U.S. EPA, 2565 Plymouth Road, Ann Arbor, MI 48105.

FOR FURTHER INFORMATION CONTACT: Margaret Borushko, U.S. EPA, Engine Programs and Compliance Division, (734) 214-4334.

SUPPLEMENTARY INFORMATION:

I. Purpose and Background

A. Purpose

Ground level ozone levels continue to be a significant problem in many areas of the United States. In the past, the main strategy employed in efforts to reduce ground-level ozone was reduction of volatile organic compounds (VOCs). In recent years, however, it has become clear that NO_x controls are often a more effective strategy for reducing ozone. As a result, attention has turned to NO_x emission controls as the key to improving air quality in many areas of the country. Building on the emission standards for CI engines promulgated in the early 1990s, EPA has recently promulgated a new emission control program for on-highway CI engines and proposed a new program for nonroad CI engines.^{1, 2} Both of these programs contain stringent standards that will greatly reduce NO_x emissions from these engines.

Similarly, particulate matter (PM) is also a problem in many areas of the country. Currently, there are 80 PM-10 nonattainment areas across the U.S. (PM-10 refers to particles less than or equal to 10 microns in diameter). PM, like ozone, has been linked to a range of serious respiratory health problems. Levels of PM caused by mobile sources are expected to rise in the future, due to the predicted increase in the number of

¹ In this notice, the term "land-based nonroad" and "nonroad" refers to the land-based CI engines and equipment regulated under 40 CFR part 89. It does not include locomotive engines.

² See 62 FR 54694 (October 21, 1997) and 62 FR 50152 (September 24, 1997).

individual mobile sources. Both of the new emission programs referred to above, for on-highway and nonroad CI engines, are anticipated to reduce ambient PM levels, either through a reduction in directly emitted particulate matter or through a reduction in indirect (atmospheric) PM formation caused by NO_x emissions.

Domestic and ocean-going CI marine engines account for approximately 4.5 percent of total mobile source NO_x emissions nationwide. However, because of the nature of their operation, the contribution of these engines to NO_x levels in certain port cities and coastal areas is much higher. To address these emissions, today's action outlines a control program for CI marine engines at or above 37 kW that builds on EPA's programs for on-highway and land-based nonroad diesel engines identified above, EPA's recent locomotive rule, discussed below, and the International Convention on the Prevention of Pollution from Ships (MARPOL 73/78), Annex VI—Air Pollution developed by the International Maritime Organization (IMO).³ If the emission standards and other requirements for those CI marine engines that use the same technologies reflected in EPA's on-highway, land-based nonroad, or locomotive rules are implemented as discussed in today's action, EPA would expect to see NO_x and PM reductions on a per-engine basis comparable to those achieved by engines subject to those rules. The numerical levels that EPA is considering applying to very large CI marine engines were intended by IMO to result in a 30 percent NO_x reduction. EPA continues to investigate IMO's anticipated reductions for those engines, based on the age and other characteristics of the U.S. fleet.

B. Statutory Authority

Section 213(a) of the Clean Air Act (CAA) directs EPA to: (1) conduct a study of emissions from nonroad engines and vehicles; (2) determine whether emissions of carbon monoxide (CO), oxides of nitrogen (NO_x), and volatile organic compounds (VOCs, including hydrocarbons (HC)) from nonroad engines and vehicles are significant contributors to ozone or CO in more than one area which has failed to attain the national ambient air quality standards (NAAQS) for ozone or CO; and (3) if nonroad emissions are determined to be significant, regulate those categories or classes of new

³ A copy of MARPOL 73/78 Annex VI and the associated NO_x Technical Code is available in this docket.

nonroad engines and vehicles that cause or contribute to such air pollution.

The Nonroad Engine and Vehicle Emission Study required by section 213(a)(1) was completed in November 1991.⁴ The determination of the significance of emissions from nonroad engines and vehicles in more than one NAAQS nonattainment area was published on June 17, 1994.⁵ At the same time, the first set of regulations for new land-based nonroad CI engines at or above 37 kW was promulgated.⁶ These are often referred to as the nonroad Tier 1 standards for large CI engines. EPA has also issued proposed or final rules for other categories of nonroad engines, including gasoline engines less than 19 kW,⁷ gasoline marine engines (outboards and personal watercraft),⁸ and locomotives.⁹ Today's action pertains to all diesel marine engines greater than 37 kW.

C. Regulatory Background

The marine engine industry consists of a complex set of entities that manufacture a wide variety of engines. The primary entities involved include engine manufacturers, which produce marine versions of their land-based nonroad engines, and post-manufacturer marinizers, which purchase engines in

various stages of completion and adapt them for operation in the marine environment. Engine sizes range from very small engines used for auxiliary purposes onboard vessels or to propel sailboats to very large engines used to propel ocean-going cargo ships. However, as more fully described below, these engines can be categorized into three basic types: those that are derived from or that use land-based nonroad technologies; those that are derived from or that use locomotive technologies; and those that are designed for propulsion on very large ocean-going vessels.

Numerical emission standards for CI marine engines were originally proposed in 1994 as part of the proposed rule for control of emissions from new SI and CI marine engines.¹⁰ At that time, EPA had a limited understanding of the CI marine industry and, relying on the similarities between nonroad and CI marine engines, proposed to apply the same emission levels as those in the then just-developed land-based nonroad rule. The nonroad Tier 1 standards are set out in Table 1. EPA proposed that these standards for CI marine engines become effective January 1, 1999 for engines less

than 560 kW, and January 1, 2000, for engines 560 kW and above. Although no upper limits on engine size were proposed for application of these standards to CI marine engines, EPA requested comment on whether an upper limit should be established above which the emission control program being developed concurrently by the International Maritime Organization (Annex VI, Air Pollution to the International Convention on the Prevention of Pollution from Ships, MARPOL 73/78) should apply. Annex VI contains, among other provisions,¹¹ requirements to limit NO_x emissions from diesel marine engines, but sets no limits for other pollutants (*i.e.*, HC, CO, PM). Negotiations were concluded September 26, 1997, and a final version of the Annex was signed by participating IMO member nations, including the U.S. delegation. The Annex in its entirety will acquire the force of law in the United States only after it is ratified by Congress. Table 1 also contains the IMO's NO_x limits, which are intended to apply to new engines greater than 130 kW installed on vessels constructed on or after January 1, 2000, or which undergo a major conversion after that date.

TABLE 1.—COMPARISON OF PROPOSED NUMERICAL EMISSION LIMITS—EPA AND IMO

Agency	Engine speed	HC (g/kW-hr)	CO (g/kW-hr)	NO _x (g/kW-hr)	PM (g/kW-hr)
EPA (Nonroad Tier 1)	all	1.3	11.4	9.2	0.54
IMO	n < 130 rpm	None	None	17.0	None.
	130 rpm ≤ n < 2000 rpm	None	None	45*n ^(-0.2)	None.
	n ≥ 2000	None	None	9.8	None.

In response to the NPRM, several commenters requested that EPA harmonize domestic emission standards for CI marine engines to the levels being considered by IMO, in effect applying the proposed IMO limits domestically. Because the proposed IMO standards were not as stringent as the proposed domestic standards, this was a significant issue. On February 7, 1996, EPA published a Supplemental NPRM to address this and other concerns in more detail.¹² Specifically, EPA

identified and requested comment on three alternative harmonization approaches: (1) Adopt the IMO NO_x emission standard instead of the standard proposed in the NPRM; (2) retain the proposed average NO_x emission standard of 9.2 g/kW-hr and also adopt the IMO emission standards across the engine speed range as a cap which no engine could exceed; or (3) determine an appropriate engine speed or engine power output cutoff point such that engines of high horsepower and low and medium speeds would be subject to IMO emission limits and engines of low horsepower and high speed would be subject to the proposed

9.2 g/kW-hr average standard with the 9.8 g/kW-hr IMO level as a cap which no engine could exceed. EPA also sought comment on harmonizing the numerical emission limits for other pollutants. Options considered were to drop, retain, or alter the proposed standards for HC, CO, PM, and smoke.

While the development of the national marine rule and the MARPOL negotiations continued, EPA began a new action for land-based nonroad diesel engines as part of a new Agency initiative to reduce national NO_x and PM emissions from mobile sources. EPA proposed a rule that would set more stringent standards for land-based nonroad engines and equipment, known as Tier 2 standards (set out in Table 3, below).¹³ EPA proposed that these Tier 2 standards come into effect as early as 2001 for some engine categories. That

⁴This study is available in docket A-92-28.

⁵See 59 FR 31306.

⁶See 59 FR 31306 (June 17, 1994).

⁷See 60 FR 34582 (July 3, 1995) for the final rule establishing Tier 1 standards and 62 FR 14740 (March 27, 1997) for the ANPRM discussing Tier 2 standards.

⁸See 61 FR 52087 (October 4, 1996) for the final rule. EPA did not set numerical emission standards for sterndrive and inboard gasoline marine engines in this rule.

⁹See 62 FR 6365 (February 11, 1997); the final rule was signed December 17, 1997 and is available electronically (see Section VI below).

¹⁰See 59 FR 55929 (November 9, 1994).

¹¹Other provisions include requirements for ozone-depleting substances, sulfur content of fuel, incineration, VOCs from refueling, and fuel quality.

¹²See 61 FR 4600 (February 7, 1996).

¹³See 62 FR 50152 (September 24, 1997).

proposed rule also included more stringent Tier 3 standards (also set out in table 3), which would go into effect subject to a feasibility review in 2001. That feasibility review will be conducted through a public rulemaking process. Finally, marine and land-based nonroad CI engines less than 37 KW were included in the diesel land-based nonroad rule, with standards to come into effect as early as 1999 for Tier 1 and 2004 for Tier 2. Smaller CI marine engines were included in the proposal because they were not subject to any emission limits at the time (the existing marine NPRM covered only CI marine engines at or greater than 37 kW).

Also during this time, and pursuant to its Clean Air Act obligations, EPA

proposed a rule that would set emission standards for new locomotive engines, which has since been finalized.¹⁴ The locomotive program consists of three separate sets of standards, with applicability of the standards dependent on the date a locomotive is first manufactured. The first set of standards (Tier 0) applies to locomotives and locomotive engines originally manufactured from 1973 through 2001. The Tier 0 standards will be phased in over a two year period beginning in 2000, and will apply at the time of each remanufacture (as well as at the time of original manufacture for those covered locomotives originally manufactured in 2000 and 2001). The second set of

standards (Tier 1) apply to locomotives and locomotive engines originally manufactured from 2002 through 2004. Such locomotives and locomotive engines will be required to meet the Tier 1 standards at the time of original manufacture and at each subsequent remanufacture. The final set of standards (Tier 2) apply to locomotives and locomotive engines originally manufactured in 2005 and later. Such locomotives and locomotive engines will be required to meet the Tier 2 standards at the time of original manufacture and at each subsequent remanufacture. The numerical standards are contained in Table 2.

TABLE 2.—LOCOMOTIVE STANDARDS
[Line-haul only]

Tier	HC (g/kW-hr)	CO (g/kW-hr)	NO _x (g/kW-hr)	PM (g/kW-hr)
Tier 0	1.3	6.7	12.7	0.80
Tier 1	0.7	2.9	9.9	0.6
Tier 2	0.4	2.0	7.4	0.27

EPA's efforts toward new emission limits for land-based nonroad diesel engines and locomotive engines led EPA to reconsider its approach to the control of emissions from CI marine engines. Again, because of the similarities between land-based nonroad and locomotive engines and CI marine engines, EPA is considering a rule based on applying the anticipated new technologies to CI marine engines. As a result, EPA did not take final action on CI marine engines when it adopted standards for marine spark-ignition engines.¹⁵ Instead, EPA is pursuing a separate initiative for marine diesel engines which involves proposing a more ambitious emission control program than those proposed in 1994 and modified in 1996. The remainder of this ANPRM describes the new approach the Agency is considering for regulating emissions from new CI marine engines.

II. General Approach for Emission Control Program

A. Building on Land-Based Nonroad and Locomotive Rulemakings

Because of the similarities between certain CI marine engines and land-based nonroad diesel and locomotive engines, EPA intends to continue the

same general approach as described in the earlier NPRM and SNPRM. That is, EPA envisions that the emission control program for CI marine engines at or above 37 kW will in many cases be an outgrowth of and depend on EPA's proposed emission control program for other land-based engines. However, instead of basing the program on the land-based nonroad Tier 1 program, this new proposal will look to the newer Tier 2 and locomotive programs. EPA intends to draw on both of those programs for elements such as numerical standards, compliance program, and manufacturer flexibility provisions. At the same time, EPA recognizes that differences between the engines may make it difficult to apply those programs to CI marine engines. Therefore, EPA seeks comments on all aspects of the basic program outlined below and on the suitability of applying provisions of the land-based and locomotive rulemakings in this context. Interested parties should refer directly to those rules, cited above, for more details on their contents.

B. Program Scope

The emission control program contemplated by today's action is intended to cover all new propulsion or auxiliary compression-ignition engines of 37 kW or greater offered for sale, introduced into commerce, or imported into the United States for installation on a vessel that is registered or flagged in

the United States. Engines produced for installation on vessels not registered or flagged in the United States may be covered by an export exemption, as long as those vessels are not operated solely within United States. With regard to size, this rule is intended to cover all new engines from a 37 kW engine used on a small recreational vessel to a 30,000 kW or larger engine installed on an ocean-going container ship. With regard to application, the requirements are intended to cover both recreational and commercial engines. EPA requests comment generally on the proposed scope of the program and, in particular, on its effect on international commerce.

For purposes of this rulemaking, EPA considers a propulsion engine to be an engine that serves to move a vessel through water, either directly or indirectly. Any other engine installed on a vessel is considered to be an auxiliary engine. However, portable auxiliary engines of any size not permanently affixed to a marine vessel (e.g., auxiliary engines that are not permanently installed but, instead, are mounted on pallets that can be easily removed from the vessel) are not intended to be covered by this rule; those engines are subject to the land-based nonroad rule.

C. Emission Standards

1. Need for Multi-Category Approach

The engines to be covered by the emission control program contemplated

¹⁴ See 62 FR 6365 (February 11, 1997); the final rule was signed December 17, 1997, and is available electronically (see section VI below).

¹⁵ See 61 FR 52087 (October 4, 1996).

in today's action are very diverse, in terms of engine size, emission technology, control hardware, and costs associated with reducing emissions. EPA therefore believes that it is not reasonable to propose one set of numerical emission levels for all CI marine engines. Because of the differences among engines, numerical standards that are reasonable and feasible for a 37 kW engine used on an 18-foot boat may not be reasonable or feasible for a 1500 kW engine installed on a tug or a 20,000 kW engine installed on an ocean-going container ship. Similarly, numerical emission limits that are appropriate for very large engines may be too loose for smaller engines, leaving them virtually unregulated. Therefore, EPA is considering setting different numerical standards for different size CI marine engines, as discussed in further detail below. EPA seeks comment on how the categories of engines should be defined. Options for defining the categories include engine power, displacement, bore size, or underlying engine technology.

While it is also possible to consider setting numerical standards based on

the use of the vessel (i.e., whether it is used for commercial or recreational purposes), EPA is not considering doing so. Regardless of their ultimate use, CI marine engines of similar size can and do use the same emission control technologies, although they may be calibrated differently for performance reasons. Therefore, there appears to be no need to make such a use-based distinction for purposes of the proposed rulemaking.

2. Category 1: Engines Similar to Land-Based Nonroad

EPA is considering defining as a first category of CI marine engines those engines that are derived from land-based nonroad CI engines or that use similar technologies. As noted above, EPA recently issued an NPRM for control of emissions from land-based nonroad CI engines. Preliminary research confirms that many CI marine engines are derived from land-based nonroad CI engines covered in that NPRM, using the same base engine or engine block as their land-based counterparts and employing the same or similar engine technologies. Therefore, EPA believes that the NOx emission control technologies utilized for

nonroad engines can be extended to these marine engines, and concomitantly that the numerical emission levels specified for Tier 2 and Tier 3 land-based nonroad engines are appropriate for CI marine engines. The land-based nonroad standards are set out in Table 3. CI marine engines should be able to achieve these emission limits on the E3 duty cycle (described below in section I.D. of today's ANPRM) by applying technologies under development for land-based nonroad engines, including increased use of turbocharging, better engine cooling, electronic controls, and exhaust gas recirculation. Because of the relationship between land-based and marine engines, the 2001 feasibility review intended for land-based engine standards would be expanded to include a re-evaluation of any Tier 3 standards adopted for marine engines. EPA requests comment on the appropriateness of extending land-based requirements to this category of CI marine engines and on the appropriateness of promulgating Tier 3 standards for marine engines prior to a formal technology review.

TABLE 3.—PROPOSED STANDARDS AND IMPLEMENTATION DATES FOR LAND-BASED NONROAD CI ENGINES RATED OVER 37 KW

Rated power (kW)	Standard level	NMHC+NO _x (g/kW-hr)	CO (g/kW-hr)	PM (g/kW-hr)	Implementation date
37 ≤75	Tier 2	7.5	5.0	0.40	2004
	Tier 3	4.7	5.0		2008
75 ≤130	Tier 2	6.6	5.0	0.30	2003
	Tier 3	4.0	5.0		2007
130 ≤225	Tier 2	6.6	3.5	0.20	2003
	Tier 3	4.0	3.5		2006
225 ≤450	Tier 2	6.4	3.5	0.20	2001
	Tier 3	4.0	3.5		2006
450 ≤560	Tier 2	6.4	3.5	0.20	2002
	Tier 3	4.0	3.5		2006
>560	Tier 2	6.4	3.5	0.20	2006

Table 3 also sets out the proposed implementation dates for land-based nonroad engines. EPA seeks comment on applying these dates to CI marine engines. Specifically, EPA seeks comment on the extent to which implementation should be delayed to provide additional time to work out the marinization of the land-based engine or application of technology to uncontrolled CI marine engines as new standards are implemented. In addition, if such delays are required, EPA seeks comment on the appropriate extension of the schedule.

If the standards described above are directly applied to CI marine engines, one important result would be that

engines greater than 560 kW would remain unregulated until 2006. To close this gap, EPA is considering applying interim standards to these engines. One option would be to apply the Tier 1 standards described in Table 1, to go into effect in 2000 as originally proposed in the CI marine NPRM.¹⁶ The other option is to apply the IMO NOx emission limits in the interim. These standards are also scheduled to apply beginning in 2000. EPA seeks comment on the relative merits of these two approaches. If the Tier 1 standards are adopted, EPA does not believe the effective dates should be delayed for CI

marine since these emission limits are similar to those of the IMO which will go into effect for engines installed on vessels constructed on or after January 1, 2000.

3. Category 2: Engines Similar to Locomotive Engines

EPA is considering defining as a second category of CI marine engines those engines that are derived from locomotive engines or that use similar technologies. These engines are typically used in vessels such as tugs, ferries, and small coastal container or bulk carriers that operate primarily in US waters. Despite their relatively small number, these engines contribute

¹⁶ See 59 FR 55929 (November 9, 1994).

disproportionately to coastal and port NO_x levels due to the high power ratings, high number of hours they are used, and the way they are used (high load factors).

EPA is considering two ways to address emissions from engines in this category. The first approach would be to apply the NO_x emission limits contained in MARPOL Annex VI, as reflected in the NO_x curve. These limits would apply to new engines constructed on or after January 1, 2000.

Alternatively, due to their relatively high contribution to the NO_x and PM inventories on a per engine basis, more stringent emission limits may be appropriate for these engines. Thus, the second approach would be to apply the numerical emission limits for new locomotive engines to these CI marine engines (see Table 2, above). EPA seeks comment on both of these approaches, and on the extent to which the implementation dates in the locomotive rule should be adjusted to accommodate application of those standards to marine engines.¹⁷

4. Category 3: Low Speed, High Horsepower Engines

EPA is considering defining as a third category of CI marine engines those low speed, high horsepower engines that are used for propulsion purposes on ocean-going engines or Great Lakes freighters. These engines, which are typically larger than those derived from locomotive engines, are built to unique specifications onboard the vessel, and are manufactured in very small numbers. For such new engines, EPA is considering setting numerical standards for this category consistent with the IMO NO_x curve (see Table 1 above). EPA believes this approach to be reasonable for this category of engines, primarily because of their use patterns. Such engines are used in large vessels that engage in ocean travel and may operate only a limited amount of time in U.S. ports, while they are loading or unloading cargo and/or people. Setting standards more stringent than those adopted by IMO for such engines may accordingly have only a minimal impact on U.S. air quality, especially since the more stringent standards could apply only to engines installed on vessels flagged or registered in the United States. In addition, because more stringent standards would apply only to U.S. vessels, they may also affect the competitiveness of U.S. shipping vessels in the world transportation market,

since engines installed on foreign-flagged vessels would need to comply only with the IMO emission limits. EPA seeks comment on the appropriateness of this approach for these very large engines.

With regard to the effective date for Category 3 engines, EPA is considering two approaches. The first reflects the approach typically used by EPA: standards are effective based on the construction date of the engine. Under this approach, EPA would require engines manufactured on or after January 1, 2000 to meet these limits. The second approach reflects the approach typically used by IMO and which is incorporated in MARPOL Annex VI: standards are effective based on the construction date of the vessel on which they are installed. Under this approach, engines installed on vessels constructed on or after January 1, 2000 would be required to meet these limits. The difference between these two approaches is not insignificant, since construction on a vessel may begin up to two years before the engine is manufactured and installed. Thus, using the IMO approach may lead to earlier implementation. EPA seeks comment on the relative merits of either approach.

5. Smoke Standards

In previous diesel engine emission control programs, EPA has typically set smoke standards as well as NO_x and PM emission limits for diesel engines. However, as in the proposed rule for land-based and small marine nonroad engines, EPA does not intend to propose a smoke standard for the CI marine engines subject to this rule. This is primarily because a test procedure to accurately measure smoke levels has not yet been developed for marine engines. While the test for land-based engines could be used, it may be inappropriate because it does not reflect how marine engines are actually operated. In addition, current PM controls for CI engines, as well as customer awareness and demand for smoke-controlled engines, may effectively control smoke from these engines beyond any levels the Agency may reasonably set. EPA seeks comment on the necessity of setting smoke standards.

6. Remanufacturing Requirements

To address the fact that certain types of engines are kept in service for very long periods of time, both the locomotive rule and the IMO's NO_x emission control program contain remanufacturing requirements. The locomotive rule's three tiers of numerical emission limits apply to

freshly manufactured¹⁸ and existing engines whenever they are remanufactured to a condition similar to freshly manufactured. The MARPOL Annex VI NO_x curve emission limits apply to new engines and to existing engines when they are substantially modified. Remanufacturing provisions were included in both of these rules because of the slow rate of fleet turnover in these sectors, which prevents the realization of significant emission reductions from these categories of engines until well into the future. EPA seeks comment on the appropriateness of applying these rebuild provisions to Category 2 and 3 engines.

While remanufacturing provisions could be extended to Category 1 engines, EPA is not currently considering doing so for two reasons. First, current industry rebuilding practices for Category 1 engines may make it difficult to implement a remanufacturing program. As noted above, there is a large degree of diversity among these engines, in terms of their applications (e.g., auxiliary/propulsion engines on fishing vessels, barges, tugs, recreational vessels, etc.). This diversity, in turn, is likely to lead to a diverse set of remanufacturing practices, depending on application and engine type. In other words, engines on fishing vessels may not be remanufactured at the same rate as engines on recreational vessels. This diversity may make it difficult to set a uniform process and standard on the Category 1 segment of the marine industry. Second, it is not clear that a remanufacturing requirement for Category 1 engines would yield an emission benefit large enough to offset the potential burden on users, and so may not justify such a requirement. At the same time, EPA is considering extending the proposed land-based nonroad rebuild provisions to Category 1 engines. EPA seeks comment on the characteristics of rebuilding practices for Category 1 engines, the appropriateness of extending a remanufacturing requirement to those engines, and whether a remanufacturing requirement, if extended, should vary according to the intended use of the engine.

D. Duty Cycles

To ensure the benefits of the emission control program, engine manufacturers must certify their engines to the required emission limits using an appropriate duty cycle. The many kinds of duty cycles that exist for marine

¹⁷ See 62 FR 6365 (February 11, 1997); the final rule was signed December 17, 1997, and is available electronically (see section VI below).

¹⁸ In the locomotive rule, EPA defined a new locomotive to include both freshly manufactured, and remanufactured to like-new condition.

engines make it necessary to specify which duty cycle will be used to demonstrate compliance with the specified emission limits. The choice of duty cycle is a function of engine size, engine characteristics, and how the engine is used. EPA is considering separate duty cycles for propulsion and auxiliary applications for each of the three categories of engines described above.

For Category 1 propulsion engines, EPA is considering two duty cycles: the International Standards Organization (ISO) E3 and E5 duty cycles. The E3 cycle is a four-mode steady-state cycle which was developed to represent in-use operation of commercial marine diesel propulsion engines. The E5 duty cycle, which was developed to represent in-use operation of recreational marine

diesel engines, is similar to the E3 except that it includes an idle mode and is more heavily weighted towards lower power modes. At this time, EPA is considering proposing to require use of the E3 duty cycle for these engines.¹⁹

To ease the certification burden associated with this rule, EPA is considering proposing a flexibility to marine engine manufacturers that was proposed in the land-based nonroad rule for CI marine engines less than 37 kW. This provision would allow marine engines to be included in land-based engine families, thus avoiding the necessity of performing a separate certification test for both the land-based nonroad and marine engines. In essence, the flexibility would enable manufacturers to certify propulsion marine engines on ISO's C1 test cycle,

which is an 8-mode test designed for variable speed, variable load engines. Although the C1 test procedure may not be as representative of marine operation as the E3 or E5 cycles, it should provide comparable assurance of control. If this flexibility is adopted in the CI marine engine program, the engine manufacturer will not be relieved of the responsibility to ensure that the marine engine in fact meets the emission limits on the E3 test cycle even though it is part of a land-based family. EPA seeks comment on whether this cross-over testing should be allowed.

For Category 3 propulsion engines, EPA is considering applying the duty cycles and procedures contained in the International Maritime Organization's NOx Technical Code.²⁰ These test cycles are set out in Table 5.

TABLE 5.—DUTY CYCLES—CATEGORY ENGINES
(As set out in Annex VI NOx Technical Code)

Engine	Cycle
Constant-speed marine engines for ship's main propulsion, including diesel electric drive	E2
Variable-pitch propeller sets	E2
Propeller law operated main and propeller law operated auxiliary engines	E3

Finally, for Category 2 propulsion engines, EPA requests comment on whether one of the two approaches described above is appropriate, or whether another duty cycle should be required.

With regard to auxiliary engines of any category, EPA intends to propose the ISO D2 duty cycle for variable-speed engines, which was designed for constant-speed generator sets with an intermittent load. In addition, EPA is considering extending the C1 flexibility described above to marine auxiliary engines. EPA seeks comment on the appropriateness of this cross-over testing for auxiliary engines.

E. Certification and Compliance Requirements

1. Certification

EPA is planning to put into place certification, engine family selection, recordkeeping and reporting requirements similar to those proposed in the nonroad land-based rule. EPA seeks comments on any revisions to these elements that may be necessary in the context of the CI marine engine

emission control program, and any alterations that may be required for the different categories of CI marine engines.

2. Averaging, Banking, and Trading

In past federal mobile source rulemakings, EPA has adopted averaging, banking, and trading programs, and each of the programs referred to in today's ANPRM (on-highway²¹ and land-based nonroad²², locomotive²³, and gasoline marine²⁴ rules) include such programs. EPA requests comment on the need or applicability of such a program to CI marine engines.

3. Interface with IMO

Although EPA does not anticipate any difficulties with the interface between the domestic and IMO certification programs, EPA seeks comment on any problems that could arise.

4. Other Compliance Issues

EPA plans to draw on the compliance program set out in the land-based nonroad NPRM.²⁵ EPA intends to include selective enforcement auditing and recall provisions, in which engines

are tested at the production line or in the field, respectively. EPA also intends to propose emission defect warranty and reporting requirements for marine diesel engines. Tampering prohibitions and importation restrictions will be outlined in the NPRM. EPA requests comment on how to apply these programs to marine diesel engines. Commenters are encouraged to provide detailed discussion of any revisions that may be needed to the land-based nonroad version of these programs to accommodate the marine engine market. EPA seeks comment on applying similar requirements to Category 2 and Category 3 engines, and how such provisions should interface with IMO requirements. In addition, EPA seeks comment on whether the production line testing program contained in the locomotive rule should be extended to Category 1 engines as an alternative to selective enforcement auditing.

F. Other Issues

1. Competitiveness with Spark-Ignition Engines

In response to the original marine NPRM, some commenters argued that CI engines should be subject to no more stringent regulation than gasoline SI sterndrive or inboard engines.²⁶ According to these commenters, CI

¹⁹ An explanation of EPA's preliminary view on using the E3 duty cycle is set forth in Memorandum to Docket #A-96-40 from Mike Samulski, "Selection of Duty Cycle to Propose for High Speed CI Marine Engines (February 19, 1997).

²⁰ A copy of this document is available in this docket.

²¹ See 62 FR 54694 (October 21, 1997).

²² See 62 FR 50152 (September 24, 1997).

²³ See 62 FR 6365 (February 11, 1997).

²⁴ See 61 FR 52087 (October 4, 1996).

²⁵ See 62 FR 50152 (September 24, 1997).

²⁶ See 59 FR 55929 (November 9, 1994).

marine engines compete directly with SI sterndrive and inboard engines in certain markets, particularly for inboard cruisers. As described in the final rule for SI marine engines, EPA determined not to set standards for SI marine sterndrive and inboard engines, and these engines remain unregulated at this time.²⁷

EPA understands that manufacturers of inboard cruisers often give customers a choice of purchasing either gasoline or diesel engines for certain types of vessels. However, information obtained from vessel manufacturers indicates that the choice of engine is complex. Customers primarily consider reliability, durability, fuel economy, and power when making their engine choice. In other words, the decision of whether to purchase a gasoline engine or a diesel engine appears to depend mainly on the intended usage patterns of the consumer. Typically, diesel engines are more attractive to customers interested in slow cruising over long distances, while gasoline engines are more attractive to customers interested in certain performance characteristics (e.g., speed). Thus, diesel engines do not appear to compete directly with gasoline engines in that the performance of the engines is not similar and the engines are not completely interchangeable in terms of use.

Current pricing of the engines further supports this argument. Information received by EPA suggests that at nearly the same power rating, the price of diesel engines is estimated to be double that for counterpart gasoline engines, in part due to fabrication requirements. EPA believes that if the two engine types were truly competitive, their prices would be more similar. EPA nevertheless recognizes that diesel and gasoline engines are offered on some of the same or similar vessels, and is therefore requesting additional information on this issue.

2. Voluntary Low-Emitting Engine Program

EPA is interested in adopting voluntary standards involving very low-emitting engine technologies, similar to those proposed in the land-based nonroad engine NPRM. The nonroad "Blue Sky Series" program sets out voluntary standards which manufacturers can meet using novel technologies or alternative fuels. The intended goal of adopting voluntary standards is two-fold: to increase the potential for emission reductions and to encourage the development and initial introduction of new technologies. The

creation of incentives to produce Blue Sky Series engines would be left to the discretion of states or other organizations. The concentrated use of large marine engines near certain nonattainment areas should motivate consideration of these voluntary low-emission standards for new engines. Retrofit of existing engines may also be appropriate, but would not fall under the Blue Sky Series program.

Voluntary standards for diesel marine engines could be set up to be similar to those proposed for land-based engines, with some important differences. First, as proposed in the land-based nonroad NPRM, Blue Sky Series engines would be certified using the highway transient test. Testing these engines on a transient test cycle is important to ensure adequate control of particulate emissions. Use of the highway test cycle for large CI marine engines would, however, be problematic because of the very different operating modes experienced in use. Voluntary standards for some or all marine diesel engines would therefore need to rely on the ISO CI or another test cycle, with a corresponding shift in focus to reducing NOx emissions. Second, the numerical levels for the voluntary standards proposed in the land-based nonroad NPRM would need to be revised, to reflect the potential for achieving superior emission control from the various sizes of marine engines. Finally, as with the land-based nonroad Blue Sky Series program, manufacturers would not be relieved of the responsibility to demonstrate compliance with the prevailing mandatory standards, although initial certification of such engines could be streamlined.

EPA requests comment on the potential success of a voluntary emission standards program for CI marine engines. EPA further requests comment on the appropriate makeup of a program of voluntary standards for all sizes of CI marine engines, including those subject to the MARPOL Annex VI NOx levels.

III. Potential Impacts

EPA will include detailed analysis of the emissions reductions and air quality benefits that would result from the standards proposed in the NPRM. EPA will also include in the NPRM an analysis of the expected environmental and economic impacts of meeting the proposed emission standards. The estimated economic impacts for land-based nonroad engines to meet proposed standards will be the starting point for a projection of Category 1 engine impacts. EPA expects that

manufacturers will comply with diesel marine emission standards by marinizing engines that have been designed for land-based emission standards. Adjustments will be made to account for the unique design and operation of the marinized engines. Cost calculations will include certification and testing costs, as well as a consideration of fuel economy impacts resulting from the anticipated technologies; however, no fuel economy penalty was projected for land-based engines. Cost estimates for Category 2 engines will be similarly derived from the analysis completed for locomotive engines. EPA does not currently contemplate proposing standards more stringent than IMO levels for Category 3 engines and therefore intends not to estimate any cost impact for those engines.

IV. Small Business Concerns

Section 605 of the Regulatory Flexibility Act (RFA), 5 U.S.C. 601 *et seq.* requires the Administrator to assess the economic impact of proposed rules on small entities. The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996, Public Law 104-121, amended the RFA to strengthen its analytical and procedural requirements and to ensure that small entities are adequately considered during rule development. The Agency accordingly requests comment on the potential impacts on a small business of the program outlined in today's proposal. Such comments will help the Agency meet its obligations under SBREFA and will suggest how EPA can minimize the impacts of this rule for small companies that may be adversely affected.

EPA has identified three distinct groups of entities involved in the marine industry that could be affected by the emission control program under consideration. The first group, considered by EPA as "post-manufacturer marinizers," are companies that purchase an engine block from an engine manufacturer and modify it in such a way to make it adaptable to the marine environment. As with the SI marine emission standards, these companies would need to certify the marinized engines under the standards contemplated here. Most of these companies would be considered small business entities according to the size standards defined by Small Business Administration (SBA) regulations. Through early outreach efforts, EPA has learned that these small post-manufacturer marinizers may face at least two challenges not faced by large companies. First, they may have to redesign their end product, to

²⁷ See 61 FR 52087 (October 4, 1996).

incorporate a change made by their engine supplier in response to new emission requirements for CI land-based or marine engines. Second, many if not all of these companies will be facing compliance requirements for the first time. EPA requests comment on the burdens expected to be faced by these companies and potential flexibility provisions that may provide necessary relief. To identify potential flexibility provisions, commenters are encouraged to examine the proposed in the land-based nonroad NPRM.²⁸

The second group of companies that may be affected by the proposed program are engine manufacturers that produce a wide variety of on-highway and nonroad engines. As noted above, CI marine engines produced by these manufacturers are typically derived from land-based nonroad or on-highway engines or are based on the same technology. Because these engine manufacturers have control over the manufacturing process for the base on-high or nonroad engine, they also have more control than the post-manufacturer marinizers over the internal design of the marine engines they market as well as more flexibility over the marinizing process. Typically, these engine manufacturers are considered large according to the SBA size standards. EPA requests comment on the degree to which these larger CI marine engine manufacturers will be affected by the proposed emission control program and, more specifically, the extent to which it would be appropriate to include flexibility provisions for these manufacturers.

The final group of companies that may be affected by the proposed program are vessel manufacturers. They may be affected to the extent that they need to accommodate changed engine designs from their engine suppliers. EPA expects that most of the application of emission control technology to achieve proposed emission limits will not affect vessel design. EPA seeks comment from vessel manufacturers and others on the potential impact on vessel design, as well as the appropriateness of equipment manufacturer flexibilities.

V. Public Participation

The Agency is committed to a full and open regulatory process and looks forward to input from a wide range of interested parties as the rulemaking process develops. If EPA proceeds as expected with a proposed rule, these opportunities will include a formal public comment period and a public hearing. EPA encourages all interested

parties to become involved in this process as it develops.

With today's action, EPA opens a comment period for this ANPRM. Comments will be accepted through June 22, 1998. The Agency strongly encourages comment on all aspects of this proposal. The most useful comments are those supported by appropriate and detailed rationales, data, and analyses. All comments, with the exception of proprietary information, should be directed to the EPA Air Docket Section, Docket No. A-97-50 before the date specified above. Commenters who wish to submit proprietary information for consideration should clearly separate such information from other comments by (1) labeling proprietary information "Confidential Business Information" and (2) sending proprietary information directly to the contact person listed (see **FOR FURTHER INFORMATION CONTACT**) and not to the public docket. This will help ensure that proprietary information is not inadvertently placed in the docket. If a commenter wants EPA to use a submission of confidential information as part of the basis for an NPRM, then a nonconfidential version of the document that summarizes the key data or information should be sent to the docket.

Information covered by a claim of confidentiality will be disclosed by EPA only to the extent allowed and in accordance with the procedures set forth in 40 CFR part 2. If no claim of confidentiality accompanies the submission when it is received by EPA, it will be made available to the public without further notice to the commenter.

VI. Copies of Documents

This ANPRM is available in the public docket as described under **ADDRESSES** above. This document is also available electronically from the EPA internet Web site. This service is free of charge, except for any cost incurred for internet connectivity. The electronic **Federal Register** version is made available on the day of publication on the first Web site listed below. The EPA Office of Mobile Sources also publishes these notices on the second Web site listed below.

Internet (Web)
<http://www.epa.gov/EPA-AIR/>
 (either select desired date or use Search feature)
<http://www.epa.gov/OMSWWW/>
 (look in What's New or under the specific rulemaking topic)

Please note that due to differences between the software used to develop the document and the software into

which the document may be downloaded, minor changes in format, pagination, etc. may occur.

VII. Unfunded Mandates Reform Act

Under section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104-4, EPA must prepare a budgetary impact statement to accompany any general notice of proposed rulemaking or final rule that includes a Federal mandate which may result in estimated costs to State, local, or tribal governments in the aggregate, or to the private sector, of \$100 million or more. Under section 205, for any rule subject to section 202 EPA generally must select the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule and is consistent with statutory requirements. Under section 203, before establishing any regulatory requirements that may significantly or uniquely affect small governments, EPA must take steps to inform and advise small governments of the requirements and enable them to provide input.

EPA has determined that the requirements of UMRA do not extend to advance notices of proposed rulemaking such as this Advance Notice.

VIII. Administrative Designation and Regulatory Analysis

Under Executive Order (EO) 12866, the Agency must determine whether this regulatory action is "significant" and therefore subject to Office of Management and Budget (OMB) review and the requirements of the Executive Order.²⁹ The EO defines "significant regulatory action" as any regulatory action (including an advanced notice of proposed rulemaking) that is likely to result in a rule that may:

- (1) Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- (2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- (3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or,
- (4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

A draft of this ANPRM was reviewed by OMB prior to publication, as

²⁸ See 62 FR 50152 (September 24, 1997).

²⁹ See 58 FR 51735 (October 4, 1993).

required by EO 12866. Any written comments from OMB and any EPA response to OMB comments have been placed in the public docket for this Notice.

List of Subjects in 40 CFR Part 89

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Imports, Incorporation by reference, Labeling, Nonroad source pollution, Reporting and recordkeeping requirements.

Dated: May 11, 1998.

Carol M. Browner,

Administrator.

[FR Doc. 98-13791 Filed 5-21-98; 8:45 am]

BILLING CODE 6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 300

[FRL-6101-2]

National Oil and Hazardous Substances Contingency Plan; National Priorities List

AGENCY: Environmental Protection Agency.

ACTION: Notice of intent to delete Operable Units 100-IU-1 and 100-IU-3 of the Hanford 100 Area Superfund Site from the National Priorities List.

SUMMARY: The Environmental Protection Agency (EPA) Region 10 announces its intent to delete portions of the Hanford 100 Area NPL Superfund Site. The portions proposed to be deleted are the 100-IU-1 and 100-IU-3 Operable Units from the National Priorities List. The 100-IU-1 and 100-IU-3 Operable Units are part of the Hanford 100 Area NPL Site located at the U.S. Department of Energy (DOE) Hanford Site, located in southeastern Washington State. EPA is requesting comment on this action.

The NPL constitutes Appendix B to the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, which EPA promulgated pursuant to Section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This partial deletion of the 100-IU-1 and 100-IU-3 Operable Units is proposed in accordance with 40 CFR 300.425(e) and the Notice of Policy Change: Partial Deletion of Sites Listed on the National Priorities List. 60 FR 55466 (Nov. 1995).

This proposal for partial deletion pertains to all known waste areas located in the 100-IU-1 and 100-IU-3 Operable Units. The waste areas in 100-

IU-3 were associated with former military sites used to defend the Hanford Site during the Cold War. In addition, a 2-4,D burial ground is located in the 100-IU-3 Operable Unit. The primary waste areas in the 100-IU-1 Operable Unit were associated with decontamination of rail cars at the Riverland Railroad Car Wash Pit, a munitions cache, a pesticide container area, and a 2-4,D container area.

DATES: EPA will accept comments concerning its proposal for partial deletion for thirty (30) days after publication of this document in the **Federal Register** and a newspaper of record.

ADDRESSES: Comments may be sent to: Dennis Faulk, Superfund Site Manager, USEPA, 712 Swift #5, Richland, Washington 99352; (509) 376-8631.

Information Repositories: Information and the deletion docket is available for review at the information repository listed below:

U.S. Department of Energy, Public Reading Room, Washington State University, Tri-Cities Consolidated Information Center, Room 101L, 2770 University Drive, Richland, Washington 99352.

In addition, the Notice of Intent to Delete can be reviewed at the following information repositories: Portland State University, Branford Price Millar Library, Science and Engineering Floor, 934 SW Harrison and Park, Portland, Oregon; University of Washington, Suzzallo Library, Government Publications Room, Seattle, Washington; Gonzaga University, Foley Center, East 502 Boone, Spokane, Washington.

FOR FURTHER INFORMATION CONTACT: Dennis Faulk; (509)376-8631.

SUPPLEMENTARY INFORMATION:

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- I. Introduction
- II. NPL Deletion Criteria
- III. Deletion Procedures
- IV. Basis for Intended Partial Site Deletion

I. Introduction

The United States Environmental Protection Agency (EPA) Region 10 announces its intent to delete the 100-IU-1 and 100-IU-3 Operable Units from the National Priorities List. The 100-IU-1 and 100-IU-3 Operable Units are part of the Hanford 100 Area NPL Site located at The U.S. Department of Energy (DOE) Hanford Site, located in southeastern Washington State. EPA is requesting comment on this action.

EPA proposes to delete the 100-IU-1 and 100-IU-3 Operable Units from the 100 Area NPL because all appropriate CERCLA response activities have been

completed. The waste areas in the 100-IU-1 and 100-IU-3 Operable Units were cleaned up by the DOE between 1992 and 1994 using expedited response actions (ERA). At the Hanford Site, the term ERA is used to describe actions taken under CERCLA removal authority as described in 40 CFR 300.415. In February 1996, a no further action record of decision was signed documenting that previous ERA's had removed all contaminants from the waste areas in the 100-IU-1 and 100-IU-3 Operable Units to below cleanup levels for residential use established under the Washington State Model Toxics Control Act (MTCA). It should be noted, cleanup activities are continuing at other operable units of the Hanford 100 Area NPL Site.

The NPL is a list maintained by EPA of sites that EPA has determined present a significant risk to human health, welfare, or the environment. Sites on the NPL may be the subject of remedial actions financed by the Hazardous Substance Superfund (Fund). Pursuant to 40 CFR 300.425(e) of the NCP, any site or portion of a site deleted from the NPL remains eligible for remedial actions if conditions at the site warrant such action.

EPA will accept comments concerning its intent for partial deletion for thirty (30) days after publication of this notice in the **Federal Register** and a newspaper of record.

II. NPL Deletion Criteria

The NCP establishes the criteria that EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425(e), sites may be deleted from the NPL where no further response is appropriate to protect human health or the environment. In making such a determination pursuant to § 300.425(e), EPA will consider, in consultation with the State, whether any of the following criteria have been met:

Section 300.425(e)(1)(i). Responsible parties or other persons have implemented all appropriate response actions required; or

Section 300.425(e)(1)(ii). All appropriate response actions under CERCLA have been implemented under DOE's removal authority, and no further response action is deemed necessary; or

Section 300.425(e)(1)(iii). The remedial investigation has shown that the release poses no significant threat to human health or the environment and, therefore, taking of remedial measures is not appropriate.

Deletion of a portion of a site from the NPL does not preclude eligibility for subsequent remedial actions at the area deleted if future site conditions warrant