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Part II

**Environmental
Protection Agency**

40 CFR Part 90

**Phase 2 Emission Standards for New
Nonroad Spark-Ignition Nonhandheld
Engines At or Below 19 Kilowatts; Final
Rule**

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 90

[FRL-6308-6]

RIN 2060-AE29

Phase 2 Emission Standards for New Nonroad Spark-Ignition Nonhandheld Engines At or Below 19 Kilowatts

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: In this action, EPA is finalizing a second phase of emission regulations to control emissions from new nonroad spark-ignition nonhandheld engines at or below 19 kilowatts (25 horsepower). These engines are used principally in lawn and garden equipment in applications such as lawnmowers and garden tractors. The standards will result in an estimated 59 percent reduction of emissions of hydrocarbons plus oxides of nitrogen from those achieved under the current Phase 1 standards applicable to nonhandheld engines. The standards will result in important reductions in emissions which contribute to excessively high ozone levels in many areas of the United States.

In compliance with the Paperwork Reduction Act, this document announces that the information collection requirements contained in this final rule have not been submitted to the Office of Management and Budget for approval.

DATES: The amendments to 40 CFR part 90 are effective June 1, 1999.

ADDRESSES: Materials relevant to this final rule, including the Final Regulatory Impact Analysis are contained in Public Docket A-96-55, 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.

For further information on electronic availability of this final rulemaking, see **SUPPLEMENTARY INFORMATION** below.

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Regulated Entities

Entities potentially regulated by this action are those that manufacture or introduce into commerce new nonhandheld small spark-ignition nonroad engines or equipment. Regulated categories and entities include:

Category	Examples of regulated entities
Industry	Manufacturers or importers of new nonroad small (at or below 19 kW) spark-ignition nonhandheld engines and equipment.

This table is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This table lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your company is regulated by this action, you should carefully examine the applicability criteria in section § 90.1 of title 40 of the Code of Federal Regulations. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

Obtaining Electronic Copies of the Regulatory Documents

The preamble, regulatory language and Final Regulatory Impact Analysis (Final RIA) are also available electronically from the EPA Internet Web site. This service is free of charge, except for any cost already incurred for Internet connectivity. The electronic version of this final rule is made available on the day of publication on the primary Web site listed below. The EPA Office of Mobile Sources also publishes **Federal Register** notices and related documents on the secondary Web site listed below.

1. <http://www.epa.gov/docs/fedrgstr/EPA-AIR/>
(either select desired date or use Search feature)

2. <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, changes in format, page length, etc., may occur.

I. Introduction

A. Background

On January 27, 1998, EPA issued a Notice of Proposed Rulemaking (NPRM) proposing a second phase of regulations to control emissions from new handheld and nonhandheld nonroad SI engines at or below 19 kilowatts (25 horsepower) ("small SI engines") (63 FR 3950). This action was preceded by a March 27, 1997, Advanced Notice of Proposed Rulemaking (62 FR 14740). EPA solicited comment on virtually all aspects of the NPRM. EPA held a public hearing on February 6, 1998, and the public comment period for the NPRM closed March 13, 1998. Today's action finalizes this rulemaking activity for nonhandheld engines in adopting a Phase 2 set of emission standards and compliance program requirements for Class I and Class II nonhandheld engines. EPA is not at this time finalizing a Phase 2 program for handheld engines, as described in more detail below. EPA will further address the Phase 2 program for handheld engines in future **Federal Register** notices.

Today's action is taken in response to Section 213(a)(3) of the Clean Air Act which requires EPA's standards for nonroad engines and vehicles to achieve the greatest degree of emission reduction achievable through the application of technology which the Administrator determines will be available, giving appropriate consideration to cost, lead time, noise, energy and safety factors. The standards and other compliance program requirements being adopted today satisfy this Clean Air Act mandate.

The NPRM contained lengthy discussion of the proposed standards, the expected costs of their implementation, and the potential costs and benefits of adopting more stringent standards such as those that were then under consideration by the California Air Resources Board (ARB). In the NPRM, EPA explicitly asked for comment regarding the level of the proposed standards and the impacts and

timing for implementing more stringent standards, so as to allow it to establish the most appropriate standards in the final rule. In particular, EPA requested comment on the impacts and timing for implementing emission standards that would require the same types of technology as anticipated by proposed rules under consideration at that time by the California ARB.

After the close of the comment period and upon reviewing the information supplied during the comment period, EPA determined that it was desirable to get further details regarding the technological feasibility, cost and lead time implications of meeting standards more stringent than those contained in the NPRM. EPA's NPRM already contained estimates of the costs and feasibility of more stringent standards. Some commenters had charged that, based on these discussions, EPA's proposed standards would not be stringent enough to satisfy the stringency requirements of Clean Air Act Section 213(a)(3). For the purpose of gaining additional information on feasibility, cost and lead time implications of more stringent standards, EPA had several meetings, phone conversations, and written correspondence with specific engine manufacturers, with industry associations representing engine and equipment manufacturers, with developers of emission control technologies and suppliers of emission control hardware, with representatives of state regulatory associations, and with members of Congress. EPA also sought information relating to the impact on equipment manufacturers, if any, of changes in technology potentially required to meet more stringent standards than were contained in the NPRM. Additionally, EPA received numerous comments on the NPRM requesting closer harmonization with the compliance program provisions adopted by the State of California. In some cases, EPA also discussed these harmonization issues with manufacturers and industry association representatives to improve the Agency's understanding of the needs and benefits to the industry of such harmonization.

As EPA has stated on prior occasions, in adopting this final rule EPA wished to consider all relevant information that became available during the rule development process. This includes information received during the comment period on the NPRM, and, to the extent possible, important information which became available after the formal NPRM comment period had concluded. To the extent that post-NPRM information has expanded or

updated the knowledge of the Agency regarding technological feasibility, production lead time estimates for incorporating improved designs, costs to manufacturers, costs to consumers and similar factors, it is reasonable to expect that the improved information may result in changing assessments of how a pending rule can best achieve regulatory goals compared to what had been expected at the time of the NPRM. This is especially true in the case of a rulemaking concerning an industry, like small SI engines, that is undergoing relatively rapid technological innovation.

EPA published a Notice of Availability highlighting the additional information gathered in response to the NPRM (see 63 FR 66081, December 1, 1998). After analyzing this information, the Agency concluded that more stringent standards for Class I nonhandheld engines, used in applications such as residential lawn mowers, consistent with those adopted by California are indeed achievable on the national scale. This final rule for nonhandheld engines adopts emission standards considerably more stringent than those proposed for Class I nonhandheld engines. The technologies (principally conversion of side-valve engines to clean overhead valve designs) that EPA anticipates will be used in achieving compliance with the Class I standard are well known and were discussed in the NPRM.

However, since the publication of the NPRM, there have been rapid advances in emission reduction technologies for handheld engines. EPA has received information which could potentially support handheld standards much more stringent than those proposed in the NPRM. In light of this new information, and in the interest of providing an opportunity for public comment on this new technology and on more stringent levels for handheld engine emission standards, EPA intends to address Phase 2 regulations for handheld engines (such as trimmers, brush cutters, and chainsaws) in a separate Supplemental Notice of Proposed Rulemaking (SNPRM) in June of 1999, with a final rule in March of 2000.

The reader is referred to the Notice of Availability, the NPRM itself, as well as to the docket for this rulemaking, for the range of additional information upon which the Agency has relied in adopting this final program for small SI nonhandheld engines.

B. Overview of Final Program

The following provides an overview of the provisions in these Phase 2 rules for nonhandheld engines. Additional

detail explaining the program as well as discussion of information and analyses which led to the adoption of these requirements is contained in subsequent sections.

As proposed and consistent with Phase 1 rules, these Phase 2 rules

distinguish between engines used in handheld equipment and those used in nonhandheld equipment. In today's action, Phase 2 emission standards are set for distinct engine size categories referred to as "engine classes" within the nonhandheld engine equipment

designation. The following table summarizes the HC+NO_x emission standards for Class I and Class II nonhandheld engines and when these standards take effect for each engine class.

TABLE 1.—PHASE 2 HC +NO_x EMISSION STANDARDS FOR CLASS I AND CLASS II

Engine class	NPRM		FRM	
	HC+NO _x (g/kW-hr)	Time line	HC+NO _x (g/kW-hr)	Time line
Class I	25.0	2001	16.1	August 1, 2007; in addition, any Class I engine family initially produced on or after August 1, 2003 must meet the Phase 2 Class I standards before they may be introduced into commerce.
Class II	12.1	2001–2005	12.1	

As indicated in this table, the emission standards being finalized for Class I engines are considerably more stringent than the base emission levels included in the proposal. This reflects the Agency's analysis of the information EPA received in direct response to the questions posed in the NPRM concerning the desirability and feasibility of more stringent standards than the base levels proposed, as well as other information made available to the Agency before and since the proposal. The level of these standards will result in an estimated 59 percent annual reduction in combined hydrocarbon and oxides of nitrogen (HC+NO_x) emissions from these small SI nonhandheld engines compared to the Phase 1 emission requirements for these engines when the effects of this Phase 2 rule are fully phased in.

Another feature of the Phase 2 nonhandheld standards is that they are phased in over a number of years, allowing the manufacturers an orderly and efficient transition of engine designs and technologies from those complying with the existing Phase 1 standards to those necessary to meet the Phase 2 requirements. Thus, for example, the manufacturers of Class II engines are required to meet a gradually decreasing standard on average for this segment of their product line during model years 2001 through 2005. During this time frame, EPA anticipates that such a manufacturer would continue to change more and more of its Class II engines designs to designs capable of meeting the final 12.1 g/kW-hr standards, averaging emission performance with older designs and thus meeting on average the declining standard in effect for that model year (see preamble Section II.A.2). Finally, by 2005 in this example, the manufacturer would have had sufficient

time and resources to change the designs and production tooling to meet the 12.1 g/kW-hr standard on average for all its Class II engines. Similarly, a two-stage schedule has been developed to uniquely meet the industry needs for converting the Class I engines. For these nonhandheld classes, EPA has concluded that the phased-in and two-stage implementation schedules are necessary in order to make the ultimate standards achievable through the application of the specific technologies that EPA analyzed for nonhandheld engines.

These standards and the other compliance program elements being adopted today also consider expected in-use deterioration. In contrast to the Phase 1 rules which only regulate the emission performance of engines when new, the Phase 2 standards being adopted today also reflect expected deterioration in emission performance as an engine is used. Manufacturers will be required to evaluate the emission deterioration performance of their engine designs and certify their designs to meet these standards after anticipated emission deterioration of a typical in-use engine over its useful life. Different useful life ranges have been adopted based on the type of engine and equipment in which the engine is installed. For example, a Class II nonhandheld engine will be certified for from 250 to 1000 hours of use based on design features and the intended use of the installation (a high priced piece of industrial equipment would more likely be equipped with an engine with design features intended to make it most durable and thus certified to the emission standards assuming 1000 hours of in-use operation, for example).

The certification program requires that the manufacturer determine an appropriate methodology for

accumulating hours of operation to "age" an engine in a manner which duplicates the same type of wear and other deterioration mechanisms expected under typical consumer use which could affect emission performance. EPA expects bench testing will be used to conduct this aging operation because this can save time and perhaps money, but actual in-use operation (e.g., cutting grass) will also be allowed. Emission tests will be conducted when the engine is new and when it has finished accumulating the equivalent of its useful life. The engine must pass standards both when it is new and at the end of its designated useful life to qualify for certification. Additionally, the new engine and fully aged engine emission test levels are compared to determine the expected deterioration in emission performance for other engines of this design; such engines may be tested as they come off the end of a production line, in which case their new engine emission levels are adjusted by the deterioration factor determined from the certification engine to predict useful life emission performance.

Selection of engines for testing as they come off the production line will be conducted according to the provisions of the Production Line Testing (PLT) program. This program is explained in more detail in a following section but, briefly, its intent is to allow a sampling of engines as produced throughout the production period to be tested for emission performance to assure that the design intent as certified prior to production has been successfully transferred by the manufacturer to mass production in a production line setting. The volume of PLT testing required by the manufacturer depends on how close the test results from the initial engines tested are to the standards; if these test

engines indicate the design is particularly low emitting, few engines need be tested, while those designs with emission levels very close to the standards will need additional tests to make sure the design is being produced with acceptable emission performance.

While this compliance program will not require the manufacturer to conduct any in-use testing to verify continued satisfactory emission performance in the hands of typical consumers, an optional program for such in-use testing is being provided. EPA believes it is important for manufacturers to conduct in-use testing to assure the success of their designs and to factor back into their design and/or production process any information suggesting emission problems in the field. While not mandating such a program, EPA encourages such testing by allowing a manufacturer to avoid the cost of the PLT program for a portion of its product line by instead supplying data from in-use engines. Under this voluntary in-use testing program, up to twenty percent of the engine families certified in a year can be designated for in-use testing by the manufacturer. For these families, no PLT testing will be required for two model years including that model year. Instead, the manufacturer will select a minimum of three engines off the assembly line or from another source of new engines and emission test them when aged to at least 75 percent of their useful life under typical in-use operating conditions for this engine. The information relating to this in-use testing program will be shared with EPA. If any information derived from this program indicates a substantial in-use emission performance problem, EPA anticipates the manufacturer will seek to determine the nature of the emission performance problem and what corrective actions might be appropriate. EPA will offer its assistance in analysis of the reasons for unexpectedly high in-use emission performance and what actions might be appropriate for reducing these high emissions. Whether or not a manufacturer chooses to conduct such a voluntary in-use testing program, EPA may choose to conduct its own in-use compliance program. If EPA were to determine that an in-use noncompliance investigation was appropriate, the Agency expects it would conduct its own in-use testing program, separate from this voluntary manufacturer testing program, to determine whether a specific class or category of engines is complying with applicable in-use standards.

All these general provisions of this compliance program are also expected to become part of California's

compliance program for these classes of small engines.¹ Importantly, the testing and data requirements, engine family descriptors, compliance statements and similar testing and information requirements of these federal Phase 2 nonhandheld regulations are, to the best of EPA's knowledge, the same general compliance program requirements adopted by the California ARB. This is advantageous to manufacturers marketing the same product designs in California as in the other states, as they need prepare only one set of certification application information, supplying one copy to the ARB for certification in the State of California and one copy to EPA for federal certification. This similar treatment under the regulations also extends to the PLT program and the optional in-use testing program, such that any test data and related information developed for the ARB should also satisfy the federal regulatory requirements being adopted today.

In addition to the regulatory provisions outlined above, this rule adopts special provisions for small volume engine manufacturers, small volume engine families produced by other engine manufacturers, and small volume equipment manufacturers who rely on other manufacturers to supply them with these small SI nonhandheld engines. These special small volume provisions lessen the demonstration requirements and in some cases delay the effective dates of the standards so as to smooth the transition to these Phase 2 requirements. This is especially important for these small volume applications since the eligible manufacturers involved may not have the resources to ensure that engines complying with these Phase 2 standards will be available under the time frames otherwise established under these regulations. Since these provisions are limited to small volume applications, the risk to air quality is negligible. However, without these provisions, the economic impacts to small volume manufacturers could be increased and the possibility of reduced product offering would be great, especially for those products intended to serve niche markets which satisfy special needs. These flexibilities are explained more fully in section II.B. and are detailed in the regulations.

¹ While the voluntary in-use test program may not be codified in the California ARB Tier 2 rules for these engines, the ARB has agreed to adopt this same voluntary in-use test program and allow for the same decreased PLT testing.

II. Content of the Final Rule

The following sections provide additional detail on the provisions of the final rule outlined above.

A. Emission Standards and Related Provisions

1. Class Structure

This final rule maintains the same basic class structure as implemented in the Phase 1 regulations for these nonhandheld engines. The Phase 1 rules established separate classes based on engine size in recognition of the greater difficulty in controlling emissions from smaller displacement engines compared to larger displacement engines. That rule also separated engine classes into those intended for use in equipment typically carried by the operator during its use such as chain saws or string trimmers (referred to as handheld equipment) and those engines normally used in equipment which is not carried by the operator including, for example, lawnmowers and generators (this equipment being referred to as nonhandheld). These usage distinctions seemed appropriate because the small engine industry is for the most part split between these two categories, with very few manufacturers making both handheld engines and nonhandheld engines, and because the nature of these two industry segments is quite different with, for example, the handheld engine manufacturers for the most part producing engines specifically for use in their own equipment (i.e., engine and equipment manufacturers) while nonhandheld engine manufacturers typically do not also make equipment but rather are suppliers of engines to the equipment industry; other characteristics important to regulatory analysis also differ between these two industry segments. Thus, it still seems appropriate to consider these industries separately, and thus the class structure adopted today maintains the distinction between handheld and nonhandheld classes, with today's rule establishing the Phase 2 program for nonhandheld Class I and Class II. In addition, as discussed above, a Phase 2 program for handheld engines is not being adopted in today's action, but will be addressed in future **Federal Register** notices.

2. HC+NO_x Emission Standards

More stringent HC+NO_x emission standards are being finalized for Class I engines than were proposed, and the HC+NO_x emission standards for Class II engines are being adopted as proposed. The Clean Air Act at section 213 (a) (3) requires the Agency to adopt standards that result in the greatest emission

reductions achievable through the application of technology which the Administrator determines will be available, giving appropriate consideration to cost, lead time, noise, energy and safety factors. As a result of information now available, much of it in the form of comments received during the NPRM comment period, EPA has determined that standards more

stringent than those proposed for Class I engines are feasible during the next decade. With the adoption of these Class I and Class II standards, emissions will be reduced an estimated 59 percent compared to the Phase 1 nonhandheld engines. The standards being adopted today reach the goal of maximum achievable reductions for nonhandheld engines under section 213 of the Clean

Air Act. The nation should continue to benefit from improved emission performance for this category of engines at least through 2010 as these standards take effect and fleet turnover to cleaner engines occurs.

The following table compares the proposed levels of standards and the final levels of standards being adopted today.

TABLE 2.—PHASE 2 HC +NO_x EMISSION STANDARDS FOR CLASS I AND CLASS II

Engine Class	NPRM		FRM	
	HC+NO _x (g/kW-hr)	Time line	HC+NO _x (g/kW-hr)	Time line
Class I	25.0	2001	16.1	August 1, 2007; in addition, any Class I engine family initially produced on or after August 1, 2003 must meet the Phase 2 Class I standards before they may be introduced into commerce.
Class II	12.1	2001–2005	12.1	2001–2005.

For Class I, the NPRM acknowledged that a standard of the level being adopted today was technically feasible. Indeed, one of the technology changes available to achieve these standards (adopting an overhead valve configuration) has already been done on some Class I engines and is also anticipated to be a primary choice for manufacturers of Class II engines to meet their Phase 2 emission levels. The issues impacting a decision on the most appropriate Class I standards, rather, concerned the lead time necessary for the industry to convert their Class I designs and production facilities to meet these standards, the cost of this conversion, and the subsequent potential adverse impact on sales of any such increase in cost passed along to consumers. Both the industry and EPA now have an improved understanding of the lead time necessary to convert Class I engines to designs capable of meeting these low emission standards and the costs that would result. While the manufacturers' uncertainties regarding consumer acceptance may not be fully resolved, EPA believes the anticipated price increases resulting from this action will not have a significant adverse impact on sales, principally due to the fact that once fleet turnover becomes significant and Class I overhead valve engine products do not have to compete with side-valve engine products, consumer acceptance of overhead valve engines should no longer be an issue. Furthermore, major manufacturers of Class I engines support the adoption of these standards in the time frame required². Specifically, Class

I engines must all meet the 16.1 g/kW-hr HC+NO_x standard starting with engines produced on or after August 1, 2007. Additionally, all new engine families first produced on or after August 1, 2003 will also need to comply with this standard. This latter provision recognizes that manufacturers adopting new engine designs in a time frame so close to the 2007 production requirement to meet the standard should be anticipating meeting that standard in their design strategy. Furthermore, sufficient time exists between now and August 1, 2003 to allow for new designs to meet the Phase 2 standard. Finally, EPA expects the manufacturers will take advantage of this production window between August 2003 and August 2007 to smooth the transition to a fully complying product line by August 2007 by phasing in production of Phase 2 engines during these four years. Thus, the environment should benefit by the early introduction of complying engines, and the manufacturers will benefit by the flexibility to introduce engines during this transition period in a manner and schedule which best fits their individual needs.

This standard for Class I engines is identical to the standard adopted by the State of California as part of its Tier 2 regulations for this class of small spark-ignition engines. However, these federal regulations tend to allow additional time in consideration of the need to convert perhaps additional designs not targeted, at least initially, for the California market, and of the significantly greater cost and logistical

burden of converting production facilities to meet the much larger federal sales volumes. Nevertheless, this alignment in standards should assist the industry in targeting production and distribution of engines since, when fully implemented, an engine meeting California standards will also meet federal standards (and vice versa); such an engine can be sold anywhere in the United States.

While EPA anticipates manufacturers may choose to meet the Class I Phase 2 standard by converting their engines to OHV designs (similar to the case for Class II engines as explained in the NPRM), other options are also available such as the adoption of improved fuel metering and/or the use of a catalytic converter. The standards adopted today do not rely on only one technology, nor do they mandate use of any specific technology.

As proposed, the final rule adopts standards of 12.1 g/kW-hr HC+NO_x for Class II engines, phased in over the 2001 through 2005 model years. Again, when coupled with the actions being taken with regard to Class I engines, this standard and phase in schedule is technically feasible and provides sufficient lead time for changing engine designs and production facilities.

3. NMHC+NO_x Standards for Class I and II Natural Gas Fueled Engines

As proposed, EPA is adopting separate optional standards for small SI nonhandheld engines fueled by natural gas. For typical gasoline-fueled engines, the methane portion is around 5 to 10 percent of total hydrocarbons. However, for engines fueled with natural gas, the methane portion can be around 70 percent. The methane from these

² See docket A-96-55, memorandum IV-E-68, entitled "Meeting with Tecumseh Products

Company, Briggs & Stratton and Latham & Watkins".

engines has a very low ozone forming potential compared to the other hydrocarbons in the engine's exhaust. Therefore, from an ozone forming potential perspective, it is appropriate to provide an alternative set of emission

standards for engines fueled with natural gas. These standards have been adjusted to provide equivalent stringency to the HC+NO_x standards for gasoline-fueled engines as are being adopted today. Aside from these

standards, all other aspects of this rule pertain equally to engines fueled with natural gas as those fueled with gasoline.

TABLE 3.—PHASE 2 NMHC +NO_x EMISSION STANDARDS FOR CLASS I AND II

Engine Class	NMHC+NO _x (g/kW-hr)	Time line
Class I	14.8	August 1, 2007; in addition, any Class I engine family initially produced on or after August 1, 2003 must meet the Phase 2 Class I standards before they may be introduced into commerce.
Class II1	11.3	2001–2005.

4. CO Emission Standards

This final rule adopts the CO emission standards contained in the proposal for Class I and Class II engines (e.g., 610 g/kW-hr), and thereby maintains the same CO emission standard as in the Phase 1 rules (e.g., 519 g/kW-hr), when adjusted for deterioration. At this time, it does not appear that additional reductions in CO emissions from these engines will be needed to allow most areas of the country to attain the CO ambient air quality standard. However, it should be noted that many of the emission control techniques likely to be adopted to meet the Phase 2 HC+NO_x standards, in particular the conversion from side-valve to clean overhead valve designs, improved fuel metering, and combustion chamber improvements, should also result in lower CO emissions. So, although the final CO standard remains the same as the proposed standard, EPA expects some CO emission reduction will occur as a result of the technology adopted to comply with the more stringent HC+NO_x standards. EPA is not able at this time, however, to quantify the expected level of CO reductions to a sufficiently precise degree that the Agency can confidently set a more stringent standard than was proposed.

5. Useful Life Categories

Along with adopting a more stringent numerical standard for Class I engines, the minimum certification demonstration useful life has also been extended from 66 hours to 125 hours. The higher useful life designation is technically appropriate; the lower 66 hour value was proposed as a means of saving the industry cost during certification demonstration (see discussion in the NPRM, at 63 FR 3969). However, the extra cost is relatively small while the higher hours of operation provide an improved

opportunity to assess emission deterioration. Additionally, the 125 hour designation is aligned with California's requirements. Thus, a manufacturer intending to sell Class I engines in both the State of California and federally (the vast majority of engines) would have to accumulate 125 hours of service during certification to meet the California requirement; in this case, no extra burden is placed on the manufacturer by adopting this requirement federally. The minimum certification demonstration useful life for Class II engines is 250 hours, as proposed.

6. Selection of Useful Life Category

EPA proposed that the engine manufacturers would be responsible for assuring that the correct useful life was used for certification demonstration and labeling purposes (see proposed 90.105(a)). Specific criteria were proposed which the manufacturers could use in documenting their determinations of useful life category selection. Comments received suggested such a requirement was overly rigid and unnecessary. EPA remains very concerned that the manufacturers select the most appropriate useful life category for each engine to assure it is properly evaluated during certification and to assure that any averaging, banking and trading program which allows the exchange of emission credits across engine families in different useful life categories is also fair and environmentally sound. However, so as not to add potentially unnecessary burden on the industry, these rules adopt a less rigid methodology for determining useful life categories. The proposal provided for EPA intervention in the selection of the appropriate useful life category for an engine. This potential intervention would have the effect of adding uncertainty for the manufacturer, and of limiting its ability

to fully plan and execute in a timely fashion its product certification program. The program being adopted today rests the responsibility with the industry to make their best, most conscientious selection. We expect that manufacturers of Class I and II engines will have a good idea of the types of equipment their engines are typically used in and, from their marketing information, a reasonably accurate projection of the relative volumes in such typical applications. Additionally, based on design features these manufacturers build into their engines, they have a good idea of the expected useful life in such applications. Relying on this information, manufacturers should be able to make good selections of appropriate useful life categories for their engines. While these final rules leave that responsibility to the manufacturer, EPA expects to periodically review the manufacturers' decisions to assure ourselves that this regulation is being properly implemented and to determine whether modifications to these rules are appropriate. We note that this approach results in the same regulatory requirement as the State of California, eliminating any extra burden in this regard due to federal rules.

7. Emission Standards Feasibility at Longer Useful Life

In response to the NPRM, some commenters suggested the standard should be proportionately higher for engines certified to higher useful life ages. The reasoning given was that since engines are expected to have emissions deterioration with accumulation of hours of use, the more the hours of use the higher the amount of deterioration and thus the higher should be the standards. However, this presumes no design difference between an engine intended for a useful life of, for example, 250 hours versus one designed

for a useful life of 1000 hours. This is not the case. Engines designed for higher useful life markets have superior design features (such as advance fuel metering designs including fuel injection) which should result in an ability to calibrate for lower emissions when the engine is new and also have a lower rate of emission deterioration during service accumulation. The combined impact of such trends will allow engines designed for a high useful life to meet the same standards as engines designed for a shorter useful life. Thus, these final rules adopt the same standard for all engines in a nonhandheld class regardless of their intended useful life.

B. Averaging, Banking, and Trading

In this final rule, EPA is establishing a certification averaging, banking, and trading (ABT) program for Phase 2 nonroad SI nonhandheld engines at or below 19 kW. Averaging means the exchange of emission credits among engine families within a given engine manufacturer's product line. Averaging allows a manufacturer to certify one or more engine families to Family Emissions Limits (FELs) above the applicable emission standard. However, the increased emissions would have to be offset by one or more engine families certified to FELs below the same emission standard, such that the average emissions in a given model year from all of the manufacturer's families (weighted by various parameters including engine power, useful life, and number of engines produced) are at or below the level of the emission standard. Banking means the retention of emission credits by the engine manufacturer generating the credits for use in future model year averaging or trading. Trading means the exchange of emission credits between engine manufacturers which then can be used for averaging purposes, banked for future use, or traded to another engine manufacturer.

The new program would be the first ABT program for nonroad SI engines, since the Phase 1 rule did not include an ABT program. EPA believes this new program is an important element in making the stringent Phase 2 emissions standards adopted in this final rule achievable with regard to technological feasibility, lead time, and cost. The new ABT program is intended to enhance the flexibility offered to engine manufacturers that will be needed in changing their entire product lines to meet the stringent HC+NO_x standards being adopted. The ABT program also encourages the early introduction of cleaner engines certified under the

Phase 2 requirements, thus securing earlier emission benefits.

EPA believes that the new ABT program is consistent with the statutory requirements of section 213 of the Clean Air Act. Although the language of section 213 is silent on the issue of averaging, it allows EPA considerable discretion in determining what regulations are most appropriate for implementing section 213. The statute does not specify that a specific standard or technology must be implemented, and it requires EPA to consider costs, lead time, and other factors in making its determination of "the greatest degree of emissions reduction achievable through the application of technology which the Administrator determines will be available." Section 213(a)(3) also indicates that EPA's regulations may apply to nonroad engine classes in the aggregate, and need not apply to each nonroad engine individually. Finally, EPA believes the ABT program is consistent with the statutory requirements of the Clean Air Act.

The ABT program being finalized with today's action is similar in many ways to the program proposed for nonhandheld engines. Changes to the proposed program have been made in response to comments received on the proposal and the revised standards for Class I engines. The following discussion summarizes the main provisions of the ABT program being finalized and explains the main differences from the proposed ABT program.

As noted above, the ABT program will apply to Phase 2 small SI nonhandheld engines. The ABT program will be available for HC+NO_x emissions but will not be available for CO emissions. The ABT program will also apply to natural gas-fueled engines. All credits for natural gas-fueled engines will be determined against the applicable NMHC+NO_x standards. In addition, manufacturers will be allowed to freely exchange NMHC+NO_x credits from engines fueled by natural gas with HC+NO_x credits from engines fueled by fuels other than natural gas in the ABT program.

Cross-class exchange of ABT credits between nonhandheld engine families will not be restricted. EPA had proposed restricting using credits from Class I engines in determining compliance of Class II engines since the standard proposed for Class I engines was considerably less stringent than that proposed for Class II engines; it would have been quite easy to generate credits in Class I and use them to offset FELs above the standard for Class II engines. However, because of the tighter

standards being adopted for Class I engines and the one restriction (discussed below) regarding generation of credits from Class II engines, EPA is far less concerned that credits from Class I could result in delays in technology improvement for Class II, and does not believe that any cross-class restrictions for nonhandheld engines are necessary. Therefore, all restrictions on cross-class credit exchanges for small SI nonhandheld engines have been eliminated.

As part of the ABT program, EPA is setting upper limits on the FEL values that may be declared by manufacturers under the Phase 2 standards. (The FEL is established by the manufacturer and takes the place of the emission standard for all compliance determinations.) The proposed FEL upper limits were based on the previous set of standards (i.e., the Phase 1 standards) for nonhandheld engines after accounting for in-use deterioration, which is typically how EPA establishes such limits. Therefore, EPA is adopting HC+NO_x FEL upper limits of 32.2 g/kW-hr for Class I engines and 26.8 g/kW-hr for Class II engines as proposed, even though the HC+NO_x emission standard adopted for Class I engines is more stringent than originally proposed.

EPA is finalizing one limitation that applies to Class II engines only. As proposed, because of concerns over the potential to generate significant credits from existing Phase 1 engines against the Phase 2 standards, EPA is requiring that a manufacturer's production-weighted average of HC+NO_x FELs for Class II engines may not exceed 13.6 g/kW-hr in model year 2005, 13.1 g/kW-hr in model year 2006, and 12.6 g/kW-hr in model years 2007 and later. This calculation is based strictly on the FELs and does not allow the manufacturer to factor in the use of credits, as is done when a manufacturer demonstrates compliance with the HC+NO_x standard of 12.1 g/kW-hr. EPA believes this approach will ensure that Class II engines are converted to OHV or OHV-comparable technology in a reasonable time frame while still encouraging the early introduction of cleaner, more durable technology and ensuring that manufacturers have the flexibility provided by an ABT program to comply with the new standards. For Class I, EPA does not have a similar concern since the standards being adopted are expected to provide only limited opportunity to generate large amounts of credits from existing engines.

All credits will be calculated based on the difference between the manufacturer-established FEL and the Phase 2 HC+NO_x standard for the

applicable model year using the following equation.

Credits=(Standard—
FEL)×Production×Power×Useful
life×Load Factor

At the time of certification, manufacturers must also supply information to EPA on the terms used in the above noted equation. "Production" represents the manufacturer's U.S. production of engines for the given engine family, excluding exported engines and engines that will be sold in California. "Power" represents the maximum modal power of the certification test engine over the certification test cycle. "Useful Life" is the regulatory useful life established by the manufacturer for the given engine family. "Load Factor" is a constant that is dependent on the test cycle over which the engine is certified.

Under the new ABT program for small SI nonhandheld engines, credits will have an unlimited credit life and will not be discounted in any manner.

The equation being adopted for credit calculation in today's action has been revised from the proposal in two ways. First, EPA proposed that manufacturers use the 49-state sales of an engine family instead of 49-state production levels. However, because of the non-integrated nature of the nonroad small SI market, EPA believes it would be very difficult for manufacturers to determine actual sales. EPA believes that production levels should provide an appropriately accurate estimate of sales. Second, EPA proposed that manufacturers use a sales-weighted average maximum modal power for all of the engine configurations within an engine family as opposed to the maximum modal power of the certification test engine. Because a large fraction of engine families include multiple configurations, EPA believes it would create unnecessary burden on engine manufacturers to determine the maximum modal power of every engine configuration. Using a consistent approach for estimating the maximum modal power based on the certification test engine simplifies the program for manufacturers. At the same time, it should not have any significant impact on the relative number of credits generated under the program from engines with FELs below the standards versus engines with FELs above the standards.

Under the new ABT program, manufacturers of small SI nonhandheld engines will be allowed to use portions of the ABT program prior to implementation of the Phase 2 standards to provide an incentive to

accelerate introduction of cleaner technologies into the marketplace. The Agency believes that making bankable credits available prior to the effective date of the new standards will reward those manufacturers who take on the responsibility of complying with the Phase 2 requirements sooner than required and will result in early environmental benefits. Under the early banking provisions for small SI engines, manufacturers will be allowed to begin using the averaging and banking portions of the ABT program beginning with the 1999 model year for engines certified to the Phase 2 requirements and produced after the effective date of this action. However, as was the case with certain provisions included in the proposal, the ability of a manufacturer to generate early credits also is being limited by the regulatory provisions being adopted today. The protocols adopted in these regulations assure that a manufacturer will only generate credits from engines cleaner than those otherwise anticipated to be available. In this way, manufacturers are rewarded for the extra effort of designing and producing lower emitting engines and the environment benefits from this extra effort. The regulatory provisions adopted today assure that the amount of credits received for the early introduction of a low emitting engine are appropriate considering both the current designs of engines and the changes in emission performance necessary to meet the Phase 2 standards as well as the degree to which the industry and consumers would benefit from the opportunity to generate early credits.

For Class I and Class II engines, manufacturers may generate early credits to be used for averaging or banking purposes from only those engine families certified with FELs at or below the final Phase 2 standard (i.e., 16.1 g/kW-hr HC+NO_x for Class I engines, and 12.1 g/kW-hr HC+NO_x for Class II engines (or 14.8 g/kW-hr NMHC+NO_x for Class I and 11.3 g/kW-hr NMHC+NO_x for Class II natural gas-fueled engines)). As proposed, all early credits for Class II engines will be calculated against the initial Phase 2 HC+NO_x standard of 18.0 g/kW-hr. For Class I engines, because the Phase 2 standards initially only apply to new engine family designs produced for the first time on or after August 1, 2003, EPA will allow manufacturers to generate early credits from any other Class I engines (i.e., those produced before August 1, 2003) if they are certified with an FEL at or below 16.1 g/kW-hr; the amount of the credit will

be determined by the difference between the engine family's FEL and a HC+NO_x level of 20.5 g/kW-hr. The manufacturer may continue generating early credits from such Class I engine families for as long as it continues producing the engine family until August 1, 2007 since, at that time, all Class I engine families are subject to the Phase 2 standards. The 20.5 g/kW-hr level is based on the same assumption as the initial Class II phase-in standard that half of the engines are at the Phase 1 Class I standard and the other half are at the Phase 2 Class I standard adopted today. (Any Class I engine family for which a manufacturer wishes to start generating credits for the first time after August 1, 2003, will not be eligible for early credits. Such families will be eligible to generate credits under the standard provisions of the ABT program against the Phase 2 standard of 16.1 g/kW-hr.)

All engines for which the manufacturer generates early credits must comply with all requirements for Phase 2 engines (e.g., the Production Line Testing program requirements). Manufacturers of nonhandheld engines will not be allowed to trade their early engine credits to other manufacturers until the first effective model year of the Phase 2 standards for the applicable engine class.

To be eligible for early credits for an engine family, EPA had originally proposed that a nonhandheld engine manufacturer would have to certify and comply with the initial Phase 2 standards for its entire production line in the class containing that family. EPA proposed this requirement as a means of limiting the ability of the manufacturer to generate inappropriately large amounts of early credits. However, because EPA is adopting significantly tighter standards for Class I engines than originally proposed, the ability of the manufacturer of Class I engines to easily generate large amounts of early credits is greatly diminished. Additionally, EPA believes all current manufacturers of Class II engines would meet this requirement with their currently certified Phase 1 engines, in which case the proposed restriction would have no effect. Therefore, EPA is not adopting such a requirement in today's action.

In establishing the set of declining standards for Class II engines, EPA assumed a certain phase-in of OHV or comparably clean and durable technology during the transition years. In order to encourage manufacturers to meet the assumed phase-in schedule, EPA proposed to limit the use of credits in two situations that were dependent on whether the manufacturer met the

assumed OHV phase in schedule. First, manufacturers would only be allowed to trade credits from Class II engines to Class I engines if they met the assumed phase-in schedule. Second, manufacturers would only be allowed to use early banked Class II credits beginning in 2001 or later if they met the OHV or comparably clean engine production phase-in schedule estimates for that model year. Because EPA is finalizing significantly tighter Class I standards and because EPA is adopting caps on the long term levels of FELs, EPA does not believe that the proposed limits on the use of credits which were tied to whether a manufacturer was meeting the assumed OHV technology phase in are necessary. These aspects of the final rule should eliminate EPA's concern that introduction of OHV or comparably clean engine technology could be delayed. Therefore, EPA is not finalizing the limits on the use of credits that were dependent on a manufacturer showing compliance with the assumed OHV phase-in schedule for Class II engines.

As discussed in section II.E. of today's notice, EPA is finalizing several compliance flexibility provisions for engine manufacturers and equipment manufacturers that allow the limited use of Phase 1 engines in the Phase 2 time frame. Phase 1 engines sold by engine manufacturers under the flexibility provisions will be excluded from the ABT program. In other words, engine manufacturers will not have to use credits to certify Phase 1 engines used for the flexibility provisions even though they would likely exceed the newly adopted Phase 2 standards.

Another flexibility provision described in section II.E. of today's notice allows engine manufacturers to certify Class II side-valve engine families with annual sales of 1,000 units or less to an HC+NO_x cap of 24.0 g/kW-hr starting with the 2010 model year. For such engine families, the ABT program allows manufacturers to exclude such engine families for the 2010 model year and later. As noted in section II.E., EPA is dropping the portion of the proposed flexibility for small volume Class II SV engine families for model years 2001 through 2009 that would have allowed them to meet the 24.0 g/kW-hr HC plus NO_x level and be included in the ABT program (for model years 2001 through 2004) if they exceeded this level. In its place, the Agency is adopting a flexibility that allows small volume engine families to meet the Phase 1 requirements for model years 2001 through 2009. Class II SV engine families taking advantage of this

flexibility during the 2001 to 2009 model years would be excluded from the ABT program.

As noted elsewhere in today's notice, EPA is adopting a number of provisions that address post-certification compliance aspects of the new standards for nonhandheld engines. In one specific case, EPA is allowing manufacturers to use credits from the certification ABT program to address excess emissions situations determined after the time of certification. As noted in the discussion on compliance, EPA does not believe that the typical type of enforcement action that could be taken when a substantial nonconformity is identified (i.e., an engine family recall order) would generally be workable for small SI engines given the nature of the market. Instead, for the purposes of implementing the PLT program, EPA is adopting provisions to allow manufacturers to use engine certification ABT credits to offset limited emission performance shortfalls for past production of engines determined through the PLT program as described in section II.D. of today's notice. Under the adopted provisions, manufacturers are allowed to use all engine credits available to them to offset such emission performance shortfalls without any cross-class restrictions.

EPA is not allowing manufacturers to automatically use ABT credits to remedy a past production nonconformance situation in the Selective Enforcement Audit (SEA) program. As described in today's action, EPA expects to primarily rely on the PLT program to monitor the emissions performance of production engines. However, EPA expects that SEAs may be conducted in certain cases. Therefore, as discussed in section II.D., if EPA determines that an engine family is not complying with the standards as the result of an SEA, EPA plans to work with the manufacturer on a case-by-case basis to determine an appropriate method for dealing with the nonconformity. The option(s) agreed upon by EPA and the engine manufacturer may, or may not, include the use of ABT credits to make up for any "lost" emission benefits uncovered by the SEA.

C. Test Procedures

The test procedure being adopted for the Phase 2 nonhandheld program is the steady state procedure currently used in Phase 1, with several modifications. These test procedure modifications were proposed for the reasons contained in the proposal (63 FR at 3976-77). No adverse comment was received on these proposals. First, engines equipped with

an engine speed governor must use the governor to control engine speed during the test cycle modes with the exception of Mode 1 or Mode 6. Second, the proposed test procedure for NMHC is being adopted. This test procedure will allow proper measurement of methane emissions from spark-ignition engines and permit appropriate determination of the NMHC emission for natural gas-fueled engines. Additionally, several cycle operational modifications have also been adopted as recommended by EMA (see section 4 of the Summary and Analysis of Comments).

Finally, one comment was received in regards to special test procedures accepted by EPA during the Phase 1 rulemaking and their continued use into Phase 2. EPA will continue to accept special test procedures during Phase 2 (including those approved under Phase 1) as long as they continue to result in emission compliance determinations expected to be equivalent to those resulting from use of the Phase 2 test procedures. Under this approach, manufacturers who test their engines using fuel satisfying California's requirements are allowed, as under Phase 1 rules, to adjust their test results in a manner which EPA determines would yield the same emission levels had the engines been tested using the test fuels meeting the specifications in the federal regulations.

D. Compliance Program

The compliance program being adopted today for Phase 2 nonhandheld engines is comprised of three parts: a pre-production certification program during which the manufacturer evaluates the expected emission performance of the engine design including the durability of that emission performance; an assembly line test program which samples product coming off the assembly line to assure the design as certified continues to have acceptable emission performance when put into mass production; and a voluntary in-use test program during which participating manufacturers evaluate the in-use emission performance of their product under typical operating conditions. Standards have been set for each class. The manufacturer divides its product offering based upon specific design criteria which have a potential for significantly different emission performance; these subdivisions are called engine families. Each engine family is required to meet the standard applicable for the class in which that engine resides unless the manufacturer chooses to participate in the ABT program also being adopted today.

The ABT program has already been described (see section II.B. for discussion of the ABT program). The other provisions of the compliance program are explained in more detail below. In all cases, to the best of EPA's knowledge, the requirements of this federal compliance program are sufficiently similar to the requirements of the California Air Resources Board program for these engines such that for engine families sold in both the State of California and federally, the engines selected for testing, the test procedures under which they are tested and the data and other information required to be supplied by regulations will be the same under both programs. Thus, we expect that a manufacturer will compile one application for certification satisfying the information needs of both programs and thus saving the manufacturer time and expense. Similarly, the EPA and California compliance programs are expected to share information such that any production line testing or in-use testing conducted for one program will satisfy the similar needs of the other program, again minimizing the burden on the manufacturers.

1. Certification

This section addresses the certification program finalized today for nonhandheld engine manufacturers. The proposed rule discussed the certification program at 63 FR 3981. Several comments were submitted in response to the proposal. EPA addresses these comments and provides detailed explanations of why the Agency retained provisions as proposed or changed the proposed provisions in the Summary and Analysis of Comments document at section 5. The certification process as required in the Act is an annual process and requires that manufacturers demonstrate that regulated engines will meet appropriate standards throughout their useful lives. The Act prohibits the sale, importation or introduction into commerce of regulated engines when not covered by a certificate.

The proposal would have required nonhandheld engine manufacturers to estimate the in-use deterioration of their engine families by different methods depending on the type of engine technology (see 63 FR 3981). For manufacturers of nonhandheld side valve (SV) engines or engines with aftertreatment (i.e., catalysts), the proposal would have required that one engine from each engine family be either field aged or bench aged to its full useful life to demonstrate compliance. If a manufacturer were to choose the

bench aging option, the emission results would have had to be adjusted using the field/bench adjustment program. The field/bench adjustment program was described in the proposal at 63 FR 3977. These results, either the field aged or adjusted bench aged, would have been used to calculate a deterioration factor which would then be applied to the results of testing done on new engines in the certification, PLT or SEA programs. For manufacturers of nonhandheld engines with overhead valve technology, the proposal would have allowed manufacturers to use an industry-wide assigned deterioration factor for certification. Manufacturers of overhead valve nonhandheld engines would have also been allowed under the proposal to establish their own deterioration factors by field aging a minimum of three engines per family to their full useful lives, provided they established deterioration factors for all of their engine families within a useful life category. Manufacturers of overhead valve engines would have been required to participate in an industry-wide Field Durability and In-use Performance Demonstration Program. This program is described in the proposal at 63 FR 3989 and its primary purpose was to verify whether the industry-wide assigned deterioration factors were appropriate.

EPA received a significant number of comments regarding the complexity of the proposed certification program, the inappropriateness of an assigned deterioration factor for all useful life categories for nonhandheld engines with overhead valve technology, the prohibitive expense of field aging engines, and the advantages of harmonizing EPA's final certification program with that of the California Air Resources Board. EPA now believes the complexity of the proposed program would make it difficult to manage and organize the certification program for both industry and the Agency. EPA also believes that harmonizing its programs with the California Air Resources Board will allow the industry to more efficiently comply with the final emission standards and requirements. Additionally, EPA is concerned the field/bench adjustment program may not be statistically reliable enough to establish appropriate deterioration factors (in an effort to control the cost of this program, only a minimum amount of data was proposed to be required; this small amount of data hurts the statistical reliability of any resulting decision).

Based on comments received and EPA's further evaluation of the proposed certification program, EPA is finalizing the certification program with

the following significant changes to the proposal. These changes, and other less significant changes, are also discussed in the Summary and Analysis of Comments document. In today's final rule, EPA is adopting a significantly less complex certification program that harmonizes with the certification program adopted by the California Air Resources Board as part of its Tier 2 regulations. In this program, manufacturers of nonhandheld engines of all technologies are required to demonstrate that their regulated engines comply with appropriate emission standards throughout the engines' useful lives. To account for emission deterioration over time, manufacturers must establish deterioration factors for each regulated pollutant for each engine family. The final rule allows manufacturers to establish deterioration factors by using bench aging procedures which appropriately predict the in-use emission deterioration expected over the useful life of an engine or an in-use evaluation which directly accounts for this deterioration. As is the case with many EPA mobile source regulations, multiplicative deterioration factors may not be less than one. Additionally, where appropriate and with suitable justification, deterioration factors may be carried over from one model year to another and from one engine family to another.

Today's final rule also provides flexibility for small volume engine manufacturers and small volume engine families, allowing manufacturers to optionally use assigned deterioration factors established by the Agency. The deterioration factors, either assigned or generated, are used to determine whether an engine family complies with each emission standard in the certification program, the production line testing program, and the Selective Enforcement Auditing program.

As in Phase 1, manufacturers can submit certification applications to the Agency electronically, either on a computer disk or through electronic mail, making the certification application process efficient for both manufacturers and the Agency. Also, EPA and the California Air Resources Board will have a common application format allowing manufacturers to more easily apply for certification.

2. Production Line Testing—Cumulative Summation Procedure

This section addresses the production line testing (PLT) program finalized today for nonhandheld engine manufacturers. The proposed rule discussed the PLT program at 63 FR 3984–89. Several comments were

submitted in response to the proposal. EPA addresses these comments and provides detailed explanations of why the Agency retained provisions as proposed or changed the proposed provisions in the Summary and Analysis of Comments document at section 5. The PLT program adopted in today's rule requires manufacturers to conduct manufacturer-run testing programs using the Cumulative Summation Procedure (CumSum).³ EPA is finalizing the program as proposed with the following significant modifications. These changes, and other less significant changes, are also discussed in the Summary and Analysis document. The proposal would have required manufacturers of handheld engine families to participate in the PLT program while allowing nonhandheld manufacturers the option of participating in the PLT program or electing to remain eligible for traditional Selective Enforcement Audits. EPA received comments both in favor of finalizing this option for nonhandheld manufacturers and removing this option and requiring all manufacturers, handheld and nonhandheld, to participate in the PLT program. Because the SEA program can only provide a single snapshot of a manufacturer's production, while the PLT program has the ability to evaluate a manufacturer's production throughout the model year, EPA believes that the PLT program provides a better evaluation of a manufacturer's production than the SEA program. Further, the PLT program does not disrupt a manufacturer's normal day to day activities. Therefore, the proposed option for nonhandheld manufacturers to elect to continue to rely on Selective Enforcement Audits is not being finalized, and nonhandheld manufacturers are required to conduct PLT programs using the CumSum approach in today's final rule.

The PLT proposal also included an opportunity for the Agency to approve alternative methods to the CumSum approach if those alternative methods met certain statistical criteria, including: the alternative methods produce substantially the same levels of producer and consumer risk as CumSum, provide for continuous sampling, and include an appropriate decision mechanism for determining noncompliance. EPA received

comments in support of the proposal to allow manufacturers to submit alternative test schemes for PLT, but also suggesting that the above criteria were too restrictive and would result in a program so closely aligned with CumSum that, by implication, the manufacturer would have no reason to pursue the alternative. Therefore, these commenters recommended EPA should either make the criteria less restrictive, or remove the specific criteria altogether. EPA believes that the proposed criteria would be crucial to developing any alternative production line testing program, and that the Agency could not approve an alternative program with less restrictive criteria. EPA also believes the CumSum procedure is an accurate and appropriate production line testing program for those manufacturers covered by the production line testing requirements. Therefore, in response to industry comments suggesting that there would be little utility in being able to seek approval of alternate methods under EPA's proposed criteria, EPA is not adopting the proposed option that would have allowed manufacturers to apply for alternative PLT methods.

The CumSum program, as finalized, requires manufacturers to conduct testing on each of their engine families (except where relieved of this requirement under provisions granting small volume flexibility). The maximum sample size that could be required for each engine family is 30 engines or 1 percent of a family's projected production, and the number of tests ultimately required is determined by the results of the testing. EPA and the California ARB have harmonized their PLT programs and both will require manufacturers to use the CumSum procedure for testing production engines. Manufacturers will be able to submit PLT reports to the Agency electronically, either on a computer disk or through electronic mail, which will save both the industry and EPA time and money.

As mentioned in the discussion on ABT, above, manufacturers may, for a limited amount of production, use ABT credits to offset the estimated excess emission of previously produced noncomplying engine designs as determined in the PLT program. For future production, the manufacturer would be expected to correct the noncompliance problem causing the emission noncompliance either by changing the production process, changing the design (which would require recertification) or raising the FEL to compensate for the higher emissions (also requiring

recertification). In the event a manufacturer raises an FEL as a result of a PLT failure, it may do so for future production as well as past production. EPA expects few instances in which the manufacturer will correct a PLT failure through raising the FEL since that would imply the manufacturer incorrectly set the initial FEL levels for that family; frequent use of this remedy would suggest the manufacturer was incapable of correctly setting the FELs for its product, in which case EPA would have to reconsider allowing a manufacturer to participate in the ABT program at its option. It should also be noted that, as proposed, compliance with the standards will be required of every covered engine. Thus, every engine that failed a PLT test would be considered in noncompliance with the standards and must be brought into compliance. EPA's rules allowing the use of the average of tests to determine compliance with the PLT program is intended only as a tool to decide when it is appropriate to suspend or revoke the certificate of conformity for that engine family, and is not meant to imply that not all engines have to comply with the standards or applicable FEL.

Under the flexibilities section, we also note that small volume manufacturers and small volume engine families need not be included in the PLT program at the manufacturer's option. Finally, EPA proposed that exceptionally low emitting engines could also be exempted from PLT testing at the manufacturer's option, however, they would also not be able to generate ABT credits. Manufacturers have indicated that they would much rather have the credits available from a low emitting engine design than the alternative of reduced PLT testing. Therefore, this proposed option has not been adopted.

3. Selective Enforcement Auditing

The proposal discussed Selective Enforcement Auditing (SEA) at 63 FR 3987-88. The SEA program is not the Agency's preferred production line testing program for small nonhandheld engines, and the CumSum approach is being finalized as the PLT program that manufacturers will conduct. Specific comments submitted regarding SEA, and EPA's responses, are discussed in the Summary and Analysis of Comments document at section 5. The SEA program is included in today's final rule as a "backstop" to the CumSum program and would be used in cases where there is evidence of improper testing or of a nonconformity that is not being addressed by the CumSum program. The SEA program, as finalized, will also apply to engine

³The CumSum procedure has been promulgated for marine engines in EPA's spark-ignition marine rule at 40 CFR Part 91 (61 FR 52088, October 4, 1996). In this section, "PLT" refers to the manufacturer-run CumSum procedure. "PLT" does not include Selective Enforcement Auditing (SEA), which is addressed separately in Section II.D.3 of this preamble.

families optionally certified to the small volume manufacturer provisions and the small volume engine family provisions, in cases where manufacturers elect not to conduct PLT testing for such families. However, as for other families, EPA does not expect families certified under the small volume provisions will be routinely tested through an SEA program.

In contrast to the PLT program, manufacturers who fail an SEA will not have the automatic option of using ABT credits to remedy noncomplying engines already introduced into commerce. The PLT program was designed to allow a manufacturer to continually evaluate its entire production and quickly respond to the results throughout the model year. EPA believes that allowing a manufacturer to use credits, for a limited amount of engines, to remedy past production emission failures is consistent with the continual evaluation provided by the PLT program. The SEA program, in contrast, is designed to be a one time, unannounced inspection of a manufacturer's production line with definitive passing or failing results. EPA believes that is this type of a compliance program, where at most only a few engine families might be tested each year, manufacturers must place more emphasis on the transition from certification to the production line and must set initial FELs accurately. To encourage accurate FEL settings at the time of certification, the SEA program does not allow manufacturers to automatically remedy SEA failures by retroactively adjusting FELs. Remedies for the SEA failure are best determined on a case-by-case basis which might include the use of ABT credits if agreeable to both EPA and the manufacturers.

4. Voluntary In-Use Testing

This section addresses the voluntary in-use testing program finalized today for nonhandheld engine manufacturers. The proposed rule discussed the in-use testing program at 63 FR 3989. Several comments were submitted in response to the proposal. EPA addresses these comments and provides detailed explanations of why the Agency retained provisions as proposed or changed the proposed provisions in the Summary and Analysis of Comments document at section 5. The proposal would have required manufacturers of nonhandheld engines manufactured with overhead valve technology to conduct up to a total of 24 emissions tests on engines that were field aged to their full useful lives. The primary function of these in-use tests was to

verify that the industry-wide deterioration factors predicted for the overhead valve engines were appropriate. Based on industry comments regarding the prohibitive expense of conducting field aged in-use tests, EPA is not adopting the proposed in-use programs in today's rule.

However, EPA still desires meaningful in-use data so that it can more appropriately assess the actual emissions inventory of this industry. Therefore, EPA is adopting a voluntary in-use testing program. The voluntary in-use testing program gives nonhandheld engine manufacturers the option of using a portion of their PLT resources to generate field aged emissions data. At the start of each model year, manufacturers may elect to place up to 20 percent of their engine families in this voluntary program. For those families in this program, manufacturers would not be required to conduct PLT for two model years, the current year and the subsequent year (the California Air Resources Board has indicated that they would also exempt families in this in-use testing program from their PLT requirements). Instead, manufacturers would place a minimum of three randomly selected production engines in existing consumer owned, independently owned, or manufacturer owned fleets. Manufacturers would install the engines in equipment that represents at least 50 percent of the production for an engine family and age the engine/equipment combination in actual field conditions to at least 75 percent of each engine's useful life. Once an engine in this program has been sufficiently field aged, the manufacturer would conduct an emissions test on that engine. Manufacturers would have three calendar years from the date they notified the Agency of their intent to include a family in the program to complete testing.

While this compliance program will not require the manufacturer to conduct any in-use testing to verify continued satisfactory emission performance in the hands of typical consumers, an optional program for such in-use testing is being provided. EPA believes it is important for manufacturers to conduct in-use testing to assure the success of their designs and to factor back into their design and/or production process any information suggesting emission problems in the field. If any information derived from this program indicates a substantial in-use emission performance problem, EPA anticipates the manufacturer will seek to determine the nature of the emission performance problem and what corrective actions

might be appropriate. EPA will offer its assistance in analysis of the reasons for unexpectedly high in-use emission performance and what actions might be appropriate for reducing these high emissions. Whether or not a manufacturer chooses to conduct such a voluntary in-use testing program, EPA may choose to conduct its own in-use compliance program. If EPA were to determine that an in-use noncompliance investigation was appropriate, the Agency expects it would conduct its own in-use testing program, separate from this voluntary manufacturer testing program, to determine whether a specific class or category of engines is complying with applicable in-use standards.

Although EPA is not finalizing the mandatory in-use testing programs proposed, the Agency is finalizing the in-use noncompliance provisions as proposed (see 63 FR 4026: Subpart I 90.808). Under these provisions, if the Agency determines that a substantial number of engines within an engine family, although properly used and maintained, do not conform to the appropriate emission standards, the manufacturer will be required to remedy the problem and conduct a recall of the noncomplying engine family as required by CAA section 207. However, we also recognize the practical difficulty in implementing an effective recall program as it would likely be impossible to properly identify the owners of equipment using small engines (there is no national requirement to register the ownership of such equipment), and it is also highly questionable whether owners or operators of such equipment would respond to an emission-related recall notice. Therefore, under the final program EPA's intent is to allow manufacturers to nominate alternative remedial measures to address potential non-compliance situations, as the proposed rulemaking notice discussed (see 63 FR 3992). EPA expects that, if successfully implemented, the use of these alternatives should obviate the need for the Agency to make findings of substantial nonconformity. In evaluating these alternatives, EPA would consider those alternatives which (1) represent a new initiative that the manufacturer was not otherwise planning to perform at that time and that has a nexus to the emission problem demonstrated by the subject engine family; (2) cost substantially more than foregone compliance costs and consider the time value of the foregone compliance costs and the foregone environmental benefit of the subject family; (3) offset at least

100 percent of the exceedance of the standard or FEL; and (4) are able to be implemented effectively and expeditiously and completed in a reasonable time. These criteria would function as ground rules for evaluating projects to determine whether their nature and burden is appropriate to remedy the environmental impact of the nonconformity while providing assurance to the manufacturer that EPA would not require excessive projects.

In addition to being evaluated according to the above criteria, alternatives would be subject to a cost cap. EPA would apply a cost cap of 75 percent above and beyond the foregone costs adjusted to present value, provided the manufacturer can appropriately itemize and justify these costs. EPA believes that this is an appropriate value which is both "substantial" and sufficient to encourage manufacturers to produce emission durable engines.

Given the important role that alternative remedial measures may play, EPA intends to develop guidance regarding alternative remedial measures. EPA will seek the input of the regulated industry, as well as other concerned stakeholders, in developing such guidance.

E. Flexibilities

In the NPRM, EPA proposed a number of flexibilities to ease the transition from the Phase 1 to the Phase 2 program, to ensure that the Phase 2 standards are cost-effective and achievable, and to reduce the compliance burden while maintaining the environmental benefits of the rule. Several comments were received on the flexibilities proposed, some supporting the proposals and others offering recommended changes. In addition, the need for modifications to the proposed set of flexibilities evolved out of the investigations which led to other changes to the proposal including the adoption of more stringent Class I standards than were proposed. The following is a summary of the revised flexibilities for this rulemaking.

1. Carry-Over Certification

Consistent with other mobile source emission certification programs, EPA will allow a manufacturer to use test data and other relevant information from a previous model year certification program to satisfy the same requirements for the existing model year certification program as long as the data and other information are still valid. Such "carry-over" of data and information is common in mobile source programs where the engine family being certified in the current

model year is identical to the engine family previously certified.

2. Small Volume Engine Manufacturer Definition

EPA proposed a number of flexibilities for engine manufacturers defined as small volume engine manufacturers; these flexibilities are identified in section II.E.4, below. While supporting these flexibilities, EMA and OPEI, on behalf of their members, commented that revisions to the definitions of small volume equipment manufacturer and small volume engine manufacturer were appropriate to protect the interests of engine manufacturers who would or would not meet the proposed definition. Specifically, EMA and OPEI recommended eliminating the "small engine manufacturer" definition altogether, and relying instead on an expanded definition of small volume engine family to meet the goal of assuring an adequate supply of engines for niche equipment applications, especially as produced by small volume equipment manufacturers. According to EMA and OPEI, providing any additional relief to small volume engine manufacturers would put these manufacturers at an unfair competitive advantage over engine manufacturers whose production volumes were too large to qualify for this relief.

The issue of the small volume engine family definition is discussed in the subsequent section. Regarding the availability of flexibilities targeted specifically for the small volume engine manufacturers, EPA remains convinced that the relatively small technical and production resources available to the smallest engine manufacturers makes their job of complying with Phase 2 emission standards significantly more difficult than for larger manufacturers with comparably greater technical and financial resources available to apply toward solving this problem. Consequently, without some additional flexibilities under these regulations, the small volume manufacturer would be much less likely to produce engines complying with the Phase 2 regulations or, if able to make the necessary design changes, would only be able to spread the cost of such changes over considerably fewer production engines. In such a case, not only would small volume engine manufacturers be financially stressed compared to their larger competitors, but they might need to pass along to their consumers a higher per unit price increase in an attempt to recover at least part of their cost of compliance. Higher price increases would make their product less

competitive. In the extreme, either due to pricing pressures or simply due to the limitations in technical capability, without additional flexibilities, small volume engine manufacturers might not be able to continue providing engines to their customers. The engine manufacturers could go out of business and their customers could suffer from a lack of engine supply. This potential for loss in engine availability would more likely fall on the shoulders of small equipment manufacturers who provide niche products and who are the more typical customers of the small volume engine manufacturers.

EPA continues to believe flexibilities aimed at the small volume engine manufacturer are appropriate and is retaining the definition of small volume engine manufacturers as proposed. As proposed, to qualify as a small volume engine manufacturer a nonhandheld engine manufacturer may produce no more than 10,000 engines annually.

3. Small Volume Engine Family Definition

EPA proposed that manufacturers of small volume nonhandheld engine families (those families with annual production of 1000 units or less) be provided cost saving flexibilities. These flexibilities are described in section II.E.4. Without such flexibilities, the cost and other difficulties of modifying these small volume engine families to comply with the Phase 2 standards may be difficult enough that the manufacturer might either be unable to complete the modification of the engine design in time or may choose for economic reasons to discontinue production of the small volume engine family. The impact of such a scenario would of course fall on the engine manufacturer through reduced engine sales, but would also fall perhaps even more significantly on small volume equipment applications, the most typical use for these small volume engine families. Due to the unique character of these small volume equipment applications, it is quite possible the equipment manufacturer might not be able to find a suitable replacement engine. In such case, the equipment manufacturer would also be significantly impacted through lost sales, and consumers would be harmed through the loss in availability of the equipment.

As noted in the prior section, EMA and OPEI commented that EPA should redefine the small volume family production volume limit from the 1000 unit maximum proposed for nonhandheld engine families to a level of less than 5,000 units. Tecumseh

requested the addition of an option of 1 percent of a manufacturer's total production as the upper limit for determining small volume engine families.

EPA has re-examined the production limits for small volume engine families and has determined that the interests of preserving the availability of small volume families would be better served by raising the small volume engine family definition to 5,000 for nonhandheld engine families. A larger number of niche equipment applications will now be served and the risk of loss in engine availability reduced. At the same time, the potential for adverse emission impacts remains very small. Given this provision 99 percent of nonhandheld engines will still be covered by the full compliance program and subject to the earliest practical implementation of the rule.

The recommendation by Tecumseh to base the small volume definition optionally on a varying scale equal to one percent (1 percent) of the engine manufacturer's sales volume is rejected as departing from the basis that absolute size of the family dictates whether it is a niche application. Furthermore, a small volume engine definition based on the total production volume of the manufacturer would disproportionately benefit the largest manufacturers who, in all other respects, tend to be in the best position to comply with the Phase 2 regulations.

4. Flexibilities for Small Volume Engine Families and Small Volume Engine Manufacturers

The flexibilities proposed for small volume engine manufacturers and small volume engine families received general support in comments to the NPRM. One modification to the proposed flexibilities is being adopted. To provide additional time to convert the many small volume engine families to designs complying with the Phase 2 standards and to provide additional lead time for small volume manufacturers, EPA is now adopting a provision that would allow the use of Phase 1 engines through model year 2009. Therefore, all manufacturers will have until 2010 to certify small volume nonhandheld engine families to Phase 2 requirements. Similarly, small volume engine manufacturers will have until 2010 to certify all of their Class I and Class II engine families to Phase 2 requirements.

EPA proposed allowing small volume engine families and small volume engine manufacturers to continue producing Phase 1 engines until the last year of the phase in of the Phase 2 standard applicable to the engine's

class. However, since the Class I standards being adopted today are significantly more stringent than the standards upon which this proposed flexibility was based, the number of engine families required to be modified and, especially, the degree of modification necessary has increased. This adds significantly to the technical and resource burden on the engine manufacturer. As anticipated in the proposal, EPA expects the major engine manufacturers will choose to modify their small volume engine families last as these represent niche markets. Additionally, these niche applications may represent some of the more difficult engine applications due to their unique requirements. The experience gained in designing, producing and getting in-use feedback on their larger engine family designs should be helpful in minimizing the cost and assuring the performance of the small volume engines. The design challenges for the small volume engine manufacturer have similarly increased suggesting more time to accomplish the transition to Phase 2 standards would be warranted. EPA expects manufacturers will take advantage of the extra time being adopted today to smooth the transition to Phase 2 standards by bringing the small volume engines into compliance throughout this time period. Due to the fact that the circumstances vary greatly from one manufacturer to another, it would be inappropriate to mandate a percent phase-in schedule or some other mandatory rate of phase-in for these small volume engine families and small volume manufacturers. Therefore, only a final compliance requirement of model year 2010 is being adopted. EPA has also considered the air quality impact of this flexibility and determined that one percent of the total small engine production is likely to take advantage of this option to delay compliance with the Phase 2 standards with a negligible impact on the emission benefits expected from this rule.

The following summarizes the flexibilities available to manufacturers of small volume engine families and small volume engine manufacturers for these engines.

- a. Can certify to Phase 1 standards and regulations until 2010 for eligible engine families; these engine families are excluded from ABT;
- b. Can certify using assigned deterioration factors;
- c. Can elect to not participate in PLT; SEA is still applicable.

Regarding the exclusion from ABT of engine families which take advantage of delaying implementation of the Phase 2 standards, this provision is being adopted to protect against a situation in

which a manufacturer may choose to redesign and produce a small volume engine family with low emissions (e.g., meeting the Phase 2 standards) but still certify it under these small volume provisions and generate credits all the way up to the Phase 1 standards level. Since this flexibility is intended to provide small volume manufacturers and manufacturers of small volume engine families the flexibility to delay implementation of the Phase 2 standard if necessary, it would be inappropriate and unfair to other manufacturers to also allow them to generate extra credits even after redesigning their product.

5. Flexibilities for Small Volume Equipment Manufacturers and Small Volume Equipment Models

EPA proposed flexibilities based upon equipment manufacturer needs aimed at assuring the continued supply under the Phase 2 regulations of engines for unique, typically small volume applications. These flexibilities included allowing the small volume equipment manufacturer to continue using Phase 1 compliant engines up until the third year after phase-in of the final Phase 2 standards for that engine class if the equipment manufacturer was unable to find a suitable Phase 2 engine before then. Second, EPA proposed to allow individual small volume equipment models to continue using Phase 1 compliant engines throughout the time period the Phase 2 regulation is in effect if no suitable Phase 2 engine was available and the equipment was in production at the time these Phase 2 rules were adopted. Finally, EPA proposed a hardship provision that would allow any equipment manufacturer for any of its applications to continue using a Phase 1 engine for up to one more year beyond the last phase-in of the final standard for that engine class if the requirement to otherwise use a Phase 2 compliant engine would cause substantial financial hardship.

In this final rule, EPA is adopting flexibilities which can be exercised by small volume equipment manufacturers. These flexibilities were supported by comments to the proposal and are adopted as proposed except that the criteria for determining whether someone is a small volume equipment manufacturer has been revised (see discussion in the following section II.E.6). Specifically, as proposed and for the reasons described in the proposal, the small volume equipment manufacturer will be allowed to use Phase 1 engines for up to three years beyond the last phase-in year for the standard applicable to that engine class

(or engine class and equipment category combination in the case of Class III and IV engines) if they demonstrate to EPA that no suitable Phase 2 engine is available. Secondly, small volume equipment models will be allowed to use Phase 1 compliant engines throughout the time the Phase 2 rule is in effect as long as that piece of equipment is in production as of the effective date of this rule and the manufacturer demonstrates to EPA that no suitable Phase 2 engine is available. Finally, EPA is adopting the hardship provision which will allow equipment manufacturers an additional year beyond the final phase-in of a standard to start using a Phase 2 compliant engine if they can demonstrate that earlier use would cause a significant financial hardship.

6. Small Volume Equipment Manufacturer Definition

EPA proposed that small volume equipment manufacturers would be defined as those whose annual production for sale in the U.S. across all models would be 2500 or fewer nonhandheld engines.

EMA and OPEI commented that the Small Business Administration definition of a small manufacturer should be used instead of the definition proposed by EPA for small volume equipment manufacturers. Under this definition, according to EMA and OPEI, equipment manufacturers who employed fewer than 500 persons would all be eligible for the small volume flexibilities. Alternatively, EMA and OPEI recommended that the small volume equipment manufacturer definition be expanded to include all equipment manufacturers using nonhandheld engines who produce 5000 or fewer units annually.

EPA has considered the recommendations received in comments to the NPRM and analyzed the production data available to the Agency. As explained in the proposal, opting to use a definition of 500 or fewer employees as recommended by EMA and OPEI would capture a group of equipment manufacturers with a wide-range of equipment production volumes including some who produce up to 700,000 units annually. It would also include a group of equipment manufacturers with a wide range of financial capabilities, including some which have much larger revenue streams compared to those that would be covered by the proposed definition. EPA believes the impact of this rule is more closely tied to the volume of units produced by the manufacturer (for example, if the equipment needed to be

modified to accommodate a Phase 2 engine, the impact would best be analyzed as a per unit impact) than to the number of persons employed by a firm. Therefore, establishing flexibilities under these emission rules should be based on the production volume of the manufacturer, not the number of employees. However, EPA agrees there would be advantages in expanding the definition of small volume equipment manufacturer to include slightly larger manufacturers who are still, compared to the rest of the industry, amongst the smallest. Therefore, EPA is adopting a small volume equipment definition of 5000 or fewer annual production for equipment using nonhandheld engines. This limit covers approximately two percent of the annual sales in each category. Providing the flexibilities outlined above in section II.E.5 allows significant relief to these smallest equipment manufacturers while at the same time assuring the vast majority of equipment uses the lowest emitting engines available.

7. Small Volume Equipment Model Definition

The small volume equipment model definition proposed would cover nonhandheld models of 500 or less annual production. As proposed, such small volume equipment models can use Phase 1 engines throughout Phase 2 if the manufacturer of these equipment models can demonstrate no Phase 2 compliant engine is available for existing models; if the equipment is "significantly modified" then this exemption ends, since during this modification design accommodations could be made to accept an engine meeting Phase 2 standards. This provision was proposed to permit unnecessary equipment redesign when the emission benefit from such a redesign would be negligible.

Comments were received from EMA and OPEI recommending raising the production limit to 5000 units for nonhandheld applications rather than the 500 annual production limit proposed. EPA's analysis of production data indicates that the 500 cutoff would exempt less than approximately one percent of annual sales from required use of Phase 2 engines but approximately 73 percent of the equipment models, thus providing substantial relief to many small volume applications without compromising the air quality benefits of this final rule. In contrast, a level such as 5000 for the cutoff of a small volume equipment model definition would benefit more equipment manufacturers (up to 87 percent of the equipment models) but at

a significant air quality loss, as up to six percent of the units sold could be exempt. This is too great of an emissions penalty and therefore this option is rejected. EPA is adopting as proposed a definition of small volume equipment model as 500 or fewer units annual production for nonhandheld equipment.

8. Hardship provision

EMA commented that manufacturers should not have to demonstrate a major impact on company solvency and that substantial negative economic impact or loss of market share should be enough in order to qualify for relief under the proposed hardship provision.

This hardship provision is intended to cover those extreme and unanticipated circumstances which, despite the equipment manufacturer's best efforts, place it in a situation where a lack of Phase 2 complying engines will cause such great harm to the company that the ability of the company to stay in business is at stake. It is not intended to protect an equipment manufacturer against any financial harm or potential loss of market share. EPA believes the original intent of this provision is reasonable and that the proposed criteria are reasonable. Equipment manufacturers in less dire situations may benefit from the other flexibilities being adopted today. The rules for this hardship provision are being adopted as proposed.

F. Nonregulatory Programs

EPA discussed a voluntary "green" labeling program and a voluntary fuel spillage and evaporative emission reduction program in the preamble to the NPRM. These programs are discussed in this section of the preamble. The particulate matter (PM) and hazardous air pollutant (HAP) testing program for handheld engines discussed in the NPRM will be addressed in the upcoming SNPRM for handheld engines.

1. Voluntary "Green" Labeling Program

EPA discussed the concept of a voluntary program for labeling engines with superior emission performance as a way of providing public recognition and also allowing consumers to easily determine which engines have especially clean emission performance. EPA discussed a threshold of around 50 percent of the proposed standard (e.g., around 12.5 g/kW-hr for Class I engines) as the level below which engines would qualify for "green" labeling. EPA requested comment on all aspects of the program, as well as indication of interest on the part of consumer groups, engine and

equipment manufacturers, and others in working with the Agency to develop and implement the program.

EPA received support for the voluntary "green" labeling program concept from several commenters, as well as suggestions for the design of such a program. Other commenters argued that a green labeling program is inconsistent with ABT, and still others supported a mandatory comprehensive labeling program to identify emissions levels above and below standards.

EPA remains committed to promoting clean technology, and is interested in developing a green labeling program for small SI engines in a way that does not confuse consumers or undermine environmental goals of the Phase 2 regulations. In the design of a program, it would be necessary to review appropriate levels for a green label, given the increased stringency of Class I standards in the final program, as well as to consider the appropriate interface between a green labeling program and the ABT program that is being finalized for nonhandheld engines. EPA will continue to pursue the development of voluntary green labeling program for small SI engines as a nonregulatory program.

2. Voluntary Fuel Spillage and Evaporative Emission Reduction Program

In the preamble to the NPRM, EPA discussed interest in involving stakeholders in the design of a voluntary fuel spillage and evaporative emission reduction program specifically for the small engine industry and its customers. EPA requested comment on the proposed voluntary partnership program, and indication of interest in participating in the partnership. Comments on this concept included both disappointment that EPA has not done more in these areas, as well as a willingness on the part of several commenters to work with EPA. EPA remains committed to developing voluntary programs to address fuel spillage and evaporative emission reductions, but these programs are not part of the regulations being adopted today. At this time, EPA has not been able to determine the technical feasibility of substantially controlling fuel spillage and evaporative emissions from the small engine equipment sector and therefore has not been able to determine that a program mandating such controls would be achievable for this industry.

G. General Provisions and Recommendations

In the NPRM for the Phase 2 program, EPA discussed a number of general provisions impacting Phase 2 engines, including: model year and annual production period flexibilities, definition of handheld engines, small displacement nonhandheld engine class, liquefied petroleum gas fueled indoor power equipment, dealer responsibility, engines used in recreational equipment, engines used in rescue and emergency equipment, and replacement engines. EPA received comments on several of these issues, as well as recommendations on other general issues. These general provisions and other recommendations and issues are discussed in this section of the preamble. See Section 8 of the Summary and Analysis of Comments for additional discussion of these issues.

1. Model Year Definition and Annual Production Period Flexibilities

The final program includes the same model year definition as was in effect for Phase 1, and annual production period flexibilities which were established under Phase 1 only for Class II engines. While EPA is finalizing the model year definition in effect for the Phase 1 program for the Phase 2 program, and is also finalizing flexibilities similar to those in Phase 1 for the start-up of the Phase 2 program for Class II nonhandheld engines, EPA is also clarifying in this final rule the standards to which Class II Phase 2 engine would be subject at the start-up of the program. Under the final rule, Class II engine families are required to be certified to the Phase 2 program by September 1, 2001. In addition, engine families first certified to the Phase 2 program on or before August 31, 2001, and designated as "2001 model year" families, are required to meet the 2001 emission standards (e.g., 18.0 g/kW-hr HC+NO_x). These engine families are also required to re-certify for the 2002 model year by January 1, 2002. Engine families first certified to the Phase 2 program on or before August 31, 2001, and designated as "2002 model year" families, are required to meet the 2002 model year standards (e.g., 16.6 g/kW-hr HC+NO_x).

2. Definition of Handheld Engine

EPA is finalizing the same definition for handheld engine as was in effect for Phase 1. Commenters suggested a displacement cutoff to determine which engines would meet less stringent "handheld" standards, but EPA is not adopting this suggestion. In response to

comments from Honda and others, in a separate regulatory action, EPA intends to propose modifications to criteria for determining whether an engine could be classified as handheld that, if finalized, would be applicable for the remainder of Phase 1 and also apply for the Phase 2 program. The expected proposed modification would permit a manufacturer to exceed the weight limits (14 kg for generators or pumps, or 20 kg for one-person augers) in cases where the manufacturer could demonstrate that the extra weight was the result of using a four stroke engine or other technology cleaner than the otherwise currently allowed two stroke engine.

3. Small Displacement Nonhandheld Engine Class

EPA is not adopting a small displacement nonhandheld Class in today's rule. As discussed in the preamble to the NPRM, although EPA had considered establishing a new class for the smallest nonhandheld engines, such a class and separate standards for the class were not proposed. Rather, EPA requested comment on the need for such a class and what size engines should be included. Comments and additional information were received on this issue, some of which supported setting standards equivalent to the handheld standards for engines of the same displacement. EPA believes that the appropriate standards for these smallest nonhandheld engine classes should be considered in context with the standards adopted for similar size engines used in handheld applications. Therefore, EPA is deferring a decision on this issue and will reconsider it as part of the previously mentioned planned supplementary proposal for handheld engines.

4. Liquefied Petroleum Gas Fueled Indoor Power Equipment

As proposed, the final Phase 2 program is applicable to manufacturers of liquefied petroleum gas (LPG) fueled indoor power equipment. Comments to the NPRM on this issue included a suggestion that EPA exempt from regulation small manufacturers of propane-powered spark-ignited engines used solely for indoor applications and subject to OSHA indoor air quality standards and objections to EPA's assertion of jurisdiction over such equipment. The commenters suggested that since OSHA sets permissible exposure limits for indoor air toxins and since these particular pieces of equipment are designed solely for use indoors, EPA has neither the need nor the right to regulate such equipment. In

response, however, OSHA does not set equipment emission standards; EPA has that responsibility. Additionally, the emissions from this equipment can be effectively controlled through the EPA regulations being adopted today. While many of the manufacturers of propane-powered spark-ignition engines are small volume manufacturers, the regulations being adopted today also minimize the regulatory burden on these manufacturers.

Comments were also received requesting EPA regulations allow the testing and reporting of emission on a concentration basis rather than a mass basis. Measurement of concentration of emissions can be less expensive than mass emissions and EPA understands that at least some manufacturers of propane-powered spark-ignition engines are already using such equipment to check the performance of their engines after they have been converted to run on propane. However, while concentration measurements can give an indication of the emission performance of an engine, it is a far less adequate test than the mass-based emission test adopted with the Phase 1 rules and being continued with today's action.

Another comment came from a supplier of gasoline engines whose engines have been used in propane-powered equipment after conversion to run on this alternative fuel. This manufacturer is concerned that, even though it is not responsible for the changes made to the engine to allow use of propane, its name nevertheless remains on the engine after the conversion and it may be subject to warranty claims which result from the conversion and are therefore not the fault of the original engine manufacturer. Thus this original engine manufacturer requested EPA mandate that all companies which convert gasoline-fueled engines to run on propane be required to declare themselves engine manufacturers and satisfy the certification and other compliance responsibilities of this rule including emission warranty. Such persons or companies currently engaged in making these conversions have the option of not declaring themselves a manufacturer or certifying if they can assure themselves and EPA that the conversions they are making do not increase the emissions of the engine⁴. However, in making these

modifications, the modifier also assumes responsibility for any emission-related problems due to the modification; such emission-related problems would not be the responsibility of the original engine manufacturer. While sympathetic toward the original engine manufacturer's concern of potentially increased warranty burden, EPA is retaining the policy of allowing modifications to certified engines so long as the modifier has good reason to believe such modifications do not increase emissions. Under such a policy, no emission increase should occur. Requiring the modifier to re-certify, in this case, would have no expected emission benefit but would add greatly to the burden on the modifier.

5. Dealer Responsibility

The preamble to the proposed Phase 2 program clarified that the Phase 2 program adds no additional responsibilities for dealers. As in the NPRM, the final rule contains no new constraints or responsibilities for dealers and repair facilities beyond those contained in the Phase 1 rule.

6. Engines Used in Recreational Vehicles and Applicability of the Small SI Regulations to Model Airplanes

EPA is not adopting any revisions to the provisions relating to engines used in recreational vehicles established in the Phase 1 program. No revisions were proposed by the Phase 2 NPRM. EPA does intend to address recreational vehicle issues in a separate regulatory action. This separate rulemaking will address the applicability of the small SI regulations to engines used in model airplane applications, and EPA expects to propose to consider engines that serve "only to propel a flying vehicle * * * through air" to be recreational engines provided they also meet the other existing criteria that apply to that term. As "recreational" engines they would be effectively excluded from the small SI program.

7. Engines Used in Rescue and Emergency Equipment

EPA is finalizing the provision, as proposed, that for the remainder of Phase 1 as well as for Phase 2, exempts engines which are used exclusively in emergency and rescue equipment from compliance with any standards if the equipment manufacturer can demonstrate that no certified engine is available to power the equipment as safely and practically. No comments were received on this proposal.

8. Replacement Engines

EPA proposed to continue replacement engine provisions from the August 7, 1997 rulemaking (62 FR 42638), which amended the Phase 1 rule to allow engine manufacturers to sell uncertified engines from replacement purposes subject to certain controls designed to prevent abuse. In addition, the Phase 2 proposal contained additional safeguards and reporting and record keeping requirements to further ensure against abuse.

The final Phase 2 program for replacement engines goes beyond the August 7, 1997 rule in one area. It includes the amendment which permits uncontrolled engines to be sold for pre-regulatory equipment, and Phase 1 engines to be sold for equipment built with Phase 1 engines, subject to the above constraints (90.1003(b)(5)(iv)). The final rule does not include other provisions from the Phase 2 proposal that were added to the August 7, 1997 rule. Based on comments from manufacturers, and an assessment that eliminating these provisions will result in no loss of environmental benefits, EPA has decided to eliminate these other requirements in interest of reducing the record keeping and reporting burden on manufacturers. Note that EPA intends to propose minor modifications to the replacement engine regulations in a separate regulatory action in order to clarify the responsibilities of importers.

9. Record keeping and Information Requirements

The ICRs have been revised for final rule and estimate the average annual public reporting burden for the collection of information required under the rule for a typical engine manufacturer (see section V.C. of preamble). In addition, EPA has significantly streamlined the compliance program requirements for final rule.

10. Engine Labeling

EPA proposed two alternatives for engine labeling. These alternatives differed only in the treatment of useful life hours. As indicated in the preamble to the NPRM, EPA believes inclusion of the number of hours of emission compliance for which the engine is properly certified would provide an important tool to consumers in making their purchase decisions between competing engines. EPA anticipates manufacturers will use the useful life hours of the engine as a marketing tool. For example a manufacturer might advertise that an engine family is

⁴ See EPA publications "Mobile Source Enforcement Memorandum No. 1A" (6-25-74); "Addendum to Mobile Source Enforcement Memorandum 1A" (9-4-97); and, "Revision to Addendum to Mobile Source Enforcement Memorandum 1A" (6-1-98), docket A-96-55, items IV-B-02, IV-B-03 and IV-B-04 respectively.

certified as emissions durable to 1000 hours. Thus, inclusion of meaningful useful life hours would have the potential of providing a market place mechanism regarding manufacturers who design engines for longer useful life periods.

The two alternatives for designating useful life on the engine label were to (1) simply state the useful life hours or (2) use a designator of useful life hours, for example, A, B, or C, and then adding words on the label to direct the consumer to the owner's label for an explanation of the meaning of A, B and C. This latter option was proposed only for nonhandheld engines and was based on the concern expressed by nonhandheld engine manufacturers during the development of the Statement of Principles for these engines that consumers could be confused by the meaning of the useful life period if the specific number of hours was included on the label. However, as indicated in the preamble to the NPRM, EPA was concerned that an "A, B, C" designation may not provide the same useful information to the consumer as directly including the useful hours on the label and specifically requested comment on this issue.

In their comments on the proposal, EMA and OPEI indicated they remained concerned that consumers might believe the emissions compliance period could mean something else, for example, the expected life for which the engine would provide satisfactory product performance to the consumer. EMA and OPEI indicated "(c)onsumer purchasers are not sophisticated enough to understand the difference between the EPA term of art "useful life" and the expected time of ownership of their newly purchased lawnmower. Nor will they understand the difference between emission performance and product performance." Therefore, they recommended adopting an option whereby the engine manufacturer could indicate A, B, or C on its required engine label, make reference to the owner's manual for additional explanation and explain in the owner's manual the meaning of A, B, and C where it would be easier to provide an adequate explanation of the meaning behind an emission performance period. In contrast, the North American Equipment Dealers Association (NAEDA) commented that a buyer would not know the meaning of useful life designations such as A, B, or C prior to the purchase of the equipment since the explanation of these designations would only appear in the owner's manual which is not normally

accessible to the consumer prior to purchase. Also, Honda commented specifically that engine labeling requirements should be harmonized between California and federal rules to allow an engine to be labeled for different standards and different classes. This recommendation from Honda aligns with numerous other general comments on the importance of harmonization between California and federal rules.

EPA remains concerned that an "A, B, C" designation of useful life may not be as informative of the expected emission performance period as a direct listing of the certified hours. Especially in light of NAEDA's comment, EPA is concerned about the ability of consumers to use such designations to make informed purchase decisions if their only source of explanation is the owner's manual. However, it is also not clear that including the hours listing directly on the label is the optimum alternative since, as suggested by EMA and OPEI comments, consumers may not fully understand the meaning of the emissions performance useful life hours listing and could instead, for example, believe the hours refer to perhaps a parts warranty period for the equipment in which the engine is installed. EPA is also aware of labeling options being considered by California that would allow removing the actual hours of operation from the engine label and including additional information on the product, perhaps not permanently affixed to the engine, which would satisfy the need to properly inform consumers. Allowing such labeling would also serve the goal of harmonization as supported by Honda.

Therefore, EPA is finalizing regulations which, as proposed, allow the manufacturer to use an engine label which includes the actual emissions period useful life as certified by the engine manufacturer or a label which includes an "A, B or C" designation and refers to the owners manual for further information. Based on conversations with both EMA and OPEI representatives, EPA also expects to work in partnership with the industry in developing consumer outreach material to better inform consumers of the emission improvements available through purchase of equipment using Phase 2 engines. EPA expects such outreach material will better serve the informational needs of consumers than the just relying on either of these labeling options. Additionally, the rules allow other labeling options which the Administrator determines satisfies the information intent of the label. This option is intended to allow for the

nationwide use of the California labeling system. In evaluating the adequacy of an alternative label, EPA would consider the extent to which the manufacturer's alternative engine label combined with other readily accessible consumer information adequately informs the consumer of the emission performance of the engine.

11. Emission Warranty

As proposed, EPA is not adopting revisions to the base emission performance warranty period of two years of engine use from the date of sale for this nonhandheld program. EPA will address comments from handheld manufacturers that relate specifically to whether additional flexibility is needed for some handheld products in the supplemental proposal for the Phase 2 handheld program. In addition, EPA is not adopting the proposed separate Phase 1 and Phase 2 provisions which would have required differing warranty statements. The final provisions specifying what manufacturers must warrant, therefore, remains unchanged from the existing rule.

12. Other Issues

A number of other of issues were considered in the development of this final rule, based on comments received on the proposal. These include defect reporting requirements, aftermarket provisions, closed crankcase provisions and exclusion from HC+NO_x standards for engines used exclusively in the wintertime, CO adjustments for open crankcase breathers, NO_x converter placement during testing, usage meters, and metric units. Comments received on these issues, and EPA's response to those comments, can be found in Section 8 of the Summary and Analysis of Comments document.

III. Projected Impacts

A. Environmental Benefit Assessment

National Ambient Air Quality Standards (NAAQS) have been set for criteria pollutants which adversely affect human health, vegetation, materials and visibility. Concentrations of ozone (O₃) are impacted by HC and NO_x emissions. Ambient concentrations of CO are, of course, impacted by CO emissions. EPA believes that the standards set in this rule would reduce emissions of HC and NO_x and help most areas of the nation in their progress towards compliance with the NAAQS for ozone. The following provides a summary of the roles of HC and NO_x in ozone formation, the estimated emissions impact of this rule, and the health and welfare effects of ozone, CO,

hazardous air pollutants, and particulate matter. Much of the evaluation of the health and environmental effects related to HC, NO_x and CO found in this section is also discussed in the Regulatory Impact Analysis (RIA).

1. Roles of HC and NO_x in Ozone Formation

Both HC and NO_x contribute to the formation of tropospheric ozone through a complex series of reactions. In a 1991 report, researchers emphasize that both HC and NO_x controls are needed in most areas of the United States.⁵ EPA's primary reason for controlling emissions from small SI nonhandheld engines is the role of their HC emissions in forming ozone. Of the major air pollutants for which NAAQS have been designated under the CAA, the most widespread problem continues to be ozone, which is the most prevalent photochemical oxidant and an important component of smog. The primary ozone NAAQS represents the maximum level considered protective of public health by the EPA. Ozone is a product of the atmospheric chemical reactions involving oxides of nitrogen and volatile organic compounds. These reactions occur as atmospheric oxygen and sunlight interact with hydrocarbons and oxides of nitrogen from both mobile and stationary sources.

A critical part of this problem is the formation of ozone both in and downwind of large urban areas. Under certain weather conditions, the combination of NO_x and HC has resulted in urban and rural areas exceeding the national ambient ozone standard by as much as a factor of three. Thus it is important to control HC over wider regional areas if these areas are to come into compliance with the ozone NAAQS.

2. Health and Welfare Effects of Tropospheric Ozone

Ozone is a powerful oxidant causing lung damage and reduced respiratory function after relatively short periods of exposure (approximately one hour). The oxidizing effect of ozone can irritate the nose, mouth, and throat causing coughing, choking, and eye irritation. In addition, ozone can also impair lung function and subsequently reduce the respiratory system's resistance to disease, including bronchial infections such as pneumonia.

Elevated ozone levels can also cause aggravation of pre-existing respiratory

conditions such as asthma.⁶ Ozone can cause a reduction in performance during exercise even in healthy persons. In addition, ozone can also cause alterations in pulmonary and extra pulmonary (nervous system, blood, liver, endocrine) function.

The newly revised primary NAAQS⁷ for ozone based on an 8-hour standard of 0.08 parts per million (ppm) is set at a level that, with an adequate margin of safety, is protective of public health. EPA also believes attainment of the new primary standard will substantially protect vegetation. Ozone effects on vegetation include reduction in agricultural and commercial forest yields, reduced growth and decreased survivability of tree seedlings, increased tree and plant susceptibility to disease, pests, and other environmental stresses, and potential long-term effects on forests and ecosystems.

High levels of ozone have been recorded even in relatively remote areas, since ozone and its precursors can travel hundreds of miles and persist for several days in the lower atmosphere. Ozone damage to plants, including both natural forest ecosystems and crops, occurs at ozone levels between 0.06 and 0.12 ppm.⁸ Repeated exposure to ozone levels above 0.04 ppm can cause reductions in the yields of some crops above ten percent.⁹ While strains of some crops are relatively resistant to ozone, many crops experience a loss in yield of 30 percent at ozone concentrations below the pre-revised primary NAAQS.¹⁰ The value of crops lost to ozone damage, while difficult to estimate precisely, is on the order of \$2 billion per year in the United States.¹¹ The effect of ozone on complex ecosystems such as forests is even more difficult to quantify. However, there is evidence that some forest types are negatively affected by ambient levels of ozone.¹² Specifically, in the San Bernadino Mountains of southern California, ozone is believed to be the agent responsible for the slow decline

and death of ponderosa pine trees in these forests since 1962.¹³

Finally, by trapping energy radiated from the earth, tropospheric ozone may contribute to heating of the earth's surface, thereby contributing to global warming (that is, the greenhouse effect),¹⁴ although tropospheric ozone is also known to reduce levels of UVB radiation reaching the earth's surface, the increase of which is expected to result from depletion of stratospheric ozone.¹⁵

3. Estimated Emissions Impact of the Final Regulation

The emission standards set by today's action should reduce average in-use exhaust HC+NO_x emissions from small SI nonhandheld engines approximately 59 percent beyond Phase 1 standards for nonhandheld engines by year 2027, by which time a complete fleet turnover is realized. This translates into an annual nationwide reduction of roughly 395,000 tons of exhaust HC+NO_x in year 2027 over that expected from Phase 1. Reductions in CO beyond Phase 1 levels, due to improved technology, are also to be expected by year 2027.

Along with the control of all hydrocarbons, these standards should be effective in reducing emissions of those hydrocarbons considered to be hazardous air pollutants (HAPs), including benzene and 1,3-butadiene. However, the magnitude of reduction would depend on whether the control technology reduces the individual HAPs in the same proportion as total hydrocarbons.

These emission reduction estimates are based on in-use population projections using growth estimates, engine attrition (scrappage), activity indicators and new and in-use engine emission factors. Data on activity indicators were based on the Phase 1 small SI regulation. Estimates of engine populations were based on population data available from the PSR databases¹⁶ and data provided by Engine and Equipment manufacturers and on a study done for the California Air Resources Board by Booz Allen & Hamilton (BAH). Population projections into the future are based on a linear growth assumption. Attrition rates (based on the probability that an engine remains in service into a specific calendar year) for all engines included in this analysis are developed on the

⁶United States Environmental Protection Agency, Review of the National Ambient Air Quality Standards for Ozone—Assessment of Scientific and Technical Information: OAQPS Staff Paper, EPA-450/2-92-001, June 1989, pp. VI-11 to 13.

⁷See 62 FR 38896, Friday, July 18, 1997.

⁸U.S. EPA, *Review of NAAQS for Ozone*, p. X-10.

⁹U.S. EPA, *Review of NAAQS for Ozone*, p. X-10.

¹⁰See 62 FR 38856, Friday, July 18, 1997.

¹¹U.S. EPA, *Review of NAAQS for Ozone*, p. X-22.

¹²U.S. EPA, *Review of NAAQS for Ozone*, p. X-27.

¹³U.S. EPA, *Review of NAAQS for Ozone*, p. X-29.

¹⁴NRC, *Rethinking the Ozone Problem*, p. 22.

¹⁵*The New York Times*, September 15, 1992, p. C4.

¹⁶Power Systems Research, Engine Data and Parts Link data bases, St. Paul, Minnesota, 1992.

⁵National Research Council, *Rethinking the Ozone Problem in Urban and Regional Air Pollution*, National Academy Press, 1991.

assumption that the equipment attrition function may be represented by a cumulative Normal distribution function. The in-use emission factor is based on a multiplicative deterioration factor which is a function of the square root of hours of equipment usage. 1992.

For the analysis summarized in Table 4, emission inventories were developed using EPA's NONROAD Model for the

two regulated nonhandheld engine classes as well as for all pieces of equipment using engines covered by this rule. The total annual nationwide HC, NO_x and CO emissions from small SI nonhandheld engines included in this rule were estimated for both the baseline (that is, with Phase 1 controls applied) and controlled (Phase 2) scenarios.

For the controlled scenario, EPA assumed all nonhandheld engines would be converted to overhead valve technology. As for deterioration factors, they were determined in some cases using manufacturer-supplied confidential in-use emission data and for others EPA depended on relevant information from EPA's certification data base.

TABLE 4: PROJECTED ANNUAL NATIONWIDE EXHAUST HC+NO_x Emissions [Tons/year]

Year	Without proposed controls (Phase 1)	With proposed controls	Tons reduced from Phase 1 baseline	Percentage reduction
2000	427,063	427,063		
2005	453,129	347,065	106,064	23.4
2010	499,648	242,370	257,278	51.5
2015	547,514	226,571	320,943	58.6
2020	596,343	243,118	353,225	59.2
2025	651,818	269,871	381,947	59.3

4. Health and Welfare Effects of CO Emissions

Carbon monoxide (CO) is a colorless, odorless gas which can be emitted or otherwise enters into ambient air as a result of both natural processes and human activity. Although CO exists as a trace element in the troposphere, much of human exposure resulting in elevated levels of carboxyhemoglobin (COHb) in the blood is due to incomplete fossil fuel combustion, as occurs in small SI engines.

The concentration and direct health effect of CO exposure are especially important in small SI nonhandheld engines because the operator of a small SI engine application is typically near the equipment as it functions. In some applications, the operator must be adjacent to the exhaust outlet and is in the direct path of the exhaust as it leaves the engine. According to numbers published in the Nonroad Engine and Vehicle Emission Study (NEVES), a 4-stroke, 2.9 kW lawnmower engine emits 1051.1 g/hr CO.

The toxicity of CO effects on blood and tissues, and how these effects manifest themselves as organ function changes, have also been topics of substantial research efforts. Such studies provided information for establishing the National Ambient Air Quality Standard for CO. The current primary and secondary NAAQS for CO are 9 parts per million for the one-hour average and 35 parts per million for the eight-hour average.

5. Health and Welfare Effects of Hazardous Air Pollutant Emissions

The focus of today's action is reduction of HC emissions as part of the solution to the ozone nonattainment problem. However, direct health effects are also a reason for concern due to direct human exposure to emissions from small SI nonhandheld engines during operation of equipment using such engines. Of specific concern is the emission of hazardous air pollutants (HAPs). In some applications, the operator must be adjacent to the exhaust outlet and is in the direct path of the exhaust as it leaves the engine. Today's regulatory action should be effective in reducing HAPs such as benzene and 1,3-butadiene, in so far as these are components of the HC emissions being reduced by the Phase 2 standards.

Benzene is a clear, colorless, aromatic hydrocarbon which is both volatile and flammable. Benzene is present in both exhaust and evaporative emissions. Health effects caused by benzene emissions differ based on concentration and duration of exposure. The International Agency for Research on Cancer (IARC), classified benzene as a Group I carcinogen, namely an agent carcinogenic to humans. Occupational studies continue to provide the bulk of evidence of benzene's carcinogenicity. Workers are exposed at much higher levels than is the general public. Human epidemiologic studies of highly exposed occupational cohorts have demonstrated that exposure to benzene can cause acute nonlymphocytic leukemia and other blood disorders, that is, preleukemia and aplastic anemia.

Additionally, changes in blood and bone marrow consistent with hematotoxicity are recognized in humans and experimental animals. Benzene has also been linked with genetic changes in humans and animals.

1,3-butadiene is a colorless, flammable gas at room temperature. This suspected human carcinogen is insoluble in water and its two conjugated double bonds make it highly reactive. 1,3-butadiene is formed in internal combustion engine exhaust by the incomplete combustion of the fuel and is assumed not present in evaporative and refueling emissions. The Health Risk Assessment of 1,3-Butadiene (EPA/600/P-98/001A, February 1998), concludes that 1,3-butadiene is a known human carcinogen, based on three types of evidence: (1) Excess leukemia in workers occupationally exposed to 1,3-butadiene (by inhalation), (2) occurrence of a variety of tumors in mice and rats by inhalation, and (3) evidence in animals and humans that 1,3-butadiene is metabolized into genotoxic metabolites. Other health effects due to very high levels of exposure include heart, blood and lung diseases.

Since air toxic levels generally decrease in proportion to overall emissions once emission control technology is applied, the amount of benzene and 1,3-butadiene produced by new small SI engines should diminish after this rule becomes effective. Consequently, exposure to HAPs from new nonhandheld engines would be reduced, as would associated health and

environmental effects. Although there is little data on direct health effects of small SI engines, the Swedish study concludes benzene emissions from chain saw engines as being rather high. No study has been conducted involving the health effects of HAP emissions specifically from nonhandheld engines.

6. Particulate Matter

Particulate matter, a term used for a mixture of solid particles and liquid droplets found in the air, has been linked to a range of serious respiratory health problems. These fine particles are of health concern because they easily reach the deepest recesses of the lungs. Batteries of scientific studies have linked particulate matter, especially fine particles (alone or in combination with other air pollutants), with a series of significant health problems including premature death, aggravated asthma and chronic bronchitis and increased hospital admissions. EPA has recently (July 1997) announced new NAAQS standards for particulate matter (PM), by adding two new primary PM_{2.5} standards set at concentrations of 15 micrograms per cubic meter ($\mu\mu\text{m}^3$), annual arithmetic mean, and 65 $\mu\mu\text{m}^3$, 24-hour average, to provide increased protection against the PM-related health effects found in community studies.

B. Cost and Cost-Effectiveness

EPA has calculated the cost-effectiveness of this rule by estimating costs and emission benefits for these engines. EPA made best estimates of the combination of technologies that an engine manufacturer might use to meet the new standards, best estimates of

resultant changes to equipment design, engine manufacturer compliance program costs and engine fuel savings in order to assess the expected economic impact of the Phase 2 emission standards. Emission benefits are taken from the results of the environmental benefit assessment (see section III.A, above). The cost-effectiveness result of this rule is \$852 per ton of HC+NO_x when fuel savings are not taken into account. When fuel savings are also considered, the cost-effectiveness calculation results in—\$507 per ton of HC+NO_x. This section describes the background and analysis behind these results.

The analysis for this rulemaking is based on data from engine families certified to EPA's Phase 1 standards, as of September 1998, and information on the latest technology development and related emission levels since the publication of the NPRM. The analysis does not include any production volumes that are covered by California ARB's standards. California ARB will implement emission standards for many of these engines prior to the federal Phase 2 regulations. Therefore, this rule only accounts for costs for each engine sold outside California and those engines sold in California that are not covered by the California ARB rules, such as those used in farm and construction equipment. Although EPA expects that engines already designed to meet California ARB's current standards would incur no additional design cost to meet federal standards, no effort was made to estimate which models would be sold in California and subject to

California "Tier 1" standards.¹⁹ Rather, for the purpose of this final rule, any Phase 1 engine design that would need to be modified to meet Phase 2 standards was assumed to incur the full cost of that modification, including design cost. Similarly, the cost to equipment manufacturers was assumed to be fully attributed to this federal rule even if an equipment manufacturer would have to make the same modifications in response to the California ARB regulation. The details of EPA's cost and cost-effectiveness analyses can be found in Chapters 4 and 7 of the Final Regulatory Impact Analysis (RIA) for this rule.

1. Engine Technologies

Table 5 lists the changes in technology, compared to Phase 1 engines, that have been considered in the cost estimation for this rulemaking. As discussed in section IV.A of this preamble, the standards would require different engine improvements amongst the nonhandheld and handheld engines and engine designs within those classes. For example, Class I and II side valve (SV) design engines are expected to require conversion to clean overhead valve (OHV) designs to reduce new engine out emissions and increase emission durability. Some OHV engine families in Class I and II are expected to decrease emissions through the use of enleanment, increased cooling and internal redesign such as piston ring design improvements. Additional detail regarding the impact of these modifications can be found in Chapters 3 and 4 for the Final RIA.

TABLE 5.—POTENTIAL TECHNOLOGY IMPROVEMENTS PER CLASS AND ENGINE DESIGN

Class	Engine design	Technologies
I	4 stroke—SV	Clean OHV or other innovative fuel system technologies.
I	4 stroke—OHV	Carburetor Improvements. Combustion Chamber Improvements and Intake System. Improved Oil Consumption (Piston oil control rings, valve stem seals).
I	2 stroke	Conversion to 4-stroke and clean OHV.
II	4 stroke—SV	Conversion to clean OHV.
II	4 stroke—OHV	Carburetor Improvements. Combustion Chamber Improvements and Intake System. Improved Oil Consumption (Piston oil control rings, valve stem seals).

¹⁹ For purposes of analyzing small engine and equipment manufacturer impacts of this rule, including the benefits of the small volume flexibilities being adopted, EPA considered that those manufacturers who are located in California

are likely to be marketing their engines and equipment in California and thus will be directly impacted by California's rules, not EPA's Phase 2 rules; this assumption, however, was not used in the development of the overall cost and cost

effectiveness of EPA's Phase 2 rules. Therefore, these industry cost values are slightly overstated and the cost effectiveness numbers are slightly overstated.

2. Engine Costs

The engine cost increase is based on incremental purchase prices for new engines and is comprised of variable costs (for hardware, assembly time and compliance programs), and fixed costs (for R&D and retooling). Variable costs were applied on a per engine basis and fixed costs were amortized at seven percent over five years. Engine technology cost estimates were based on the study by ICF and EF&EE in October 1996 entitled "Cost Study for Phase Two Small Engine Emission Regulations" and confidential cost estimates provided by industry. Details of the assumed costs and analysis can be found in Chapters 4 and 7 of the RIA.

Analysis of the EPA Phase 1 certification database, as of September 1998, was conducted to determine a potential impact of the Phase 2 standards on each manufacturer assuming use of the ABT program available to engine manufacturers. While ABT is permitted across classes, this analysis considered only ABT within each class since some manufacturers produce substantially in only one nonhandheld class. The choice of technologies for emission improvement of these engine families was based on the engine family that would be most influential in reducing a manufacturer's overall average emission level within that class. In addition, costs in the NPRM for conversion from SV to OHV were updated based on a letter received from one major engine manufacturer which asserted the NPRM cost estimates were incomplete. The cost analysis was updated with consideration of confidential cost information from several engine manufacturers in order to most accurately reflect expected costs.

For Class I, review of the September 1998 EPA Phase 1 database showed that 31 percent of the engine families, 8 SV engine families and 11 Class I OHV engine families, will need to incorporate at least some of the technologies listed in Table 5. For Class II, review of the September 1998 EPA Phase 1 certification database shows that 17 percent of the engine families, 4 Class II SV engine families and 22 OHV engine families, will need to incorporate emission improvements from amongst those listed in Table 5. The incorporation of such technologies will require both variable and fixed expenditures.

The Phase 2 emission standards for this diverse industry will impact companies differently depending on a company's current product offering and related deteriorated emission

characteristics used in establishing FELs for use in averaging emissions across engine families. Some large companies may improve the emission characteristics of their large volume engine families to provide credits for their smaller volume families. These companies may also improve a few engine families notably or all of their engine families slightly. The real world impact on engine manufacturers will be influenced by many factors including their ability to reduce the emissions from their major impact engine family in light of competition with others in the marketplace.

3. Equipment Costs

While equipment manufacturers would bear no responsibility for meeting emission standards, they may need to make changes in the design of their equipment models to accommodate the Phase 2 engines. EPA's treatment of the impacts of the program therefore includes an analysis of costs for equipment manufacturers. The 1996 PSR EOLINK database was utilized as the source of information for equipment manufacturers, with models and sales estimates covering all classes. The costs for equipment conversion for nonhandheld equipment was derived from the ICF/EF&EE cost study²⁰ and improved through the work by ICF and EPA on the small business impact analyses for this rulemaking. For Class I EPA conducted its own analysis using PSR estimated production data and employment and financial information from Dunn and Bradstreet. Full details of EPA's cost analysis can be found in Chapter 4 of the RIA. EPA has assumed that capital costs would be amortized at seven percent over ten years.

This rulemaking assumes that the majority of Class I engines will be converted from SV to OHV design in order to meet the emission standards. The major equipment types that use Class I engines are lawnmowers, generator sets, pumps, and tillers. For lawnmowers, it is assumed that the Class I engine redesign would have a minimal impact on equipment redesign for small volume manufacturers and a potential impact on larger volume manufacturers. This understanding is based on several factors. First, it is EPA's understanding that the smaller volume, and some larger volume, equipment manufacturers for niche markets allow space for a variety of engines to be used on their equipment.

Therefore these equipment manufacturers will have nearly no equipment impacts. Second, it is EPA's understanding that some larger equipment manufacturers may have incorporated close packaging around the engine in order to be unique in the marketplace. However, the conversion from SV to OHV is not required until August 1, 2007 (except for new engine models initially produced on or after August 1, 2003) and therefore it is assumed that this long lead time will provide equipment manufacturers the time to incorporate equipment redesigns and replace tooling dies prior to this date and within the cycle of equipment redesign and/or tooling replacements. The same assumptions have been made for the applications of generator sets, pumps and tillers.

The Class II engine change from SV to OHV design will have a large impact on equipment changes. Review of the PSR database for equipment manufacturers that utilize Class II SV engines reveals that the majority (90 percent) of small engine equipment is produced from 32 companies with the remaining 353 companies representing only 10 percent of the overall production. EPA's work analyzing small business impacts, as summarized in the work with ICF Incorporated,²¹ indicates that many of the small businesses, indicated by the PSR database to use SV Class II engines, have already converted or are in the process of converting to using OHV engine design due to market forces or changes in their engine manufacturer's offerings. These companies tend to produce professional or commercial equipment and competition has driven the use of OHV engines. The study also revealed that at least one equipment manufacturer that produces a large volume of equipment has already switched its lines from SV to OHV. For this analysis, EPA assumed that, except for this one large manufacturer, all other manufacturers will convert their engines to the use of OHV designs in direct response to this rule with all such cost attributable to this rule. EPA has assumed that any switch from SV to OHV engines by equipment manufacturers is a cost incurred due to this rulemaking. The cost estimates were based on equipment application (garden tractor, tiller, commercial turf, etc.) and in the case of the commercial turf equipment, on the power of the engine within that application.

²⁰ ICF and Engine, Fuel and Emissions Engineering, Incorporated; "Cost Study for Phase Two Small Engine Emission Regulations", Draft Final Report, October 25, 1996, in EPA Air Docket A-93-29, Item #II-A-04.

²¹ "Small Business Impact Analysis of New Emission Standards for Small Spark-Ignition Nonroad Engines and Equipment", ICF Incorporated, September 1997, located in EPA Air Docket A-96-55, Item#II-A-01.

4. Operating Costs

The total life-cycle operating costs for this rulemaking include any expected decreases in fuel consumption. Life cycle costs have been calculated per class using the NONROAD emission model. The model calculates fuel savings from the years of implementation to 2027 and takes into account factors including equipment scrappage, projected yearly sales increase per equipment type and engine power. Details on the assumptions and calculations on fuel savings are included in Chapter 4 and 7 of the RIA.

A fuel consumption savings of 15 percent has been assumed from Class I and Class II SV engines as they are converted to OHV design. OHV designs are expected to result in improved fuel economy since data show that OHV engines can run at leaner air-to-fuel ratios than SV engines.

5. Cost Per Engine and Cost-Effectiveness

a. Cost Per Engine

Total costs for this rulemaking vary per year as engine families are phased-in to compliance with the Phase 2 standards over several years, capital costs are recovered and compliance programs are conducted. The term "uniform annualized cost" is used to

express the cost of this rulemaking over the years of this analysis.

The methodology used for estimating the uniform annualized cost per engine is as follows. Cost estimates from 1995 to 1997, for technology and compliance programs respectively, were estimated and calculated to 1998 dollars through multiplication of the estimates by the applicable GDP implicit price deflators. The Phase 1 database was then analyzed, using ABT per manufacturer, to determine (1) the number of engine families per class, (2) the total number of engines per engine design, and (3) the year of technology implementation. The total estimated variable and capital costs per year were then calculated by multiplying the number of engine families and corresponding production volume by the fixed and variable costs per technology grouping, respectively. For compliance program costs, the costs for certification bench aging were estimated based on the number of families in the 1998 database and the expected certification date in the phase in. The variable costs are marked up to estimate cost to the consumer. Markups include 16 percent by the engine manufacturer, 5 percent by the equipment manufacturer and 5 percent by the mass merchandiser. All costs per year were then discounted seven percent to the first year of Phase 2 regulation per class, 2007 for Class I and

2001 for Class II. A uniform annualized cost was then calculated. Costs per engine are calculated from the uniform annualized cost for the first full year of implementation of the Phase 2 standard, 2007, and the last year of this analysis, 2027. The average cost per engine is calculated from these two values and the results are presented in Table 6 in 1998 dollars.

The yearly fuel savings (tons/yr) per class were calculated using the NONROAD model. The yearly fuel savings (tons/yr) from 2001–2027 were converted to savings (\$) through conversion to gallons per year multiplied by \$0.794 (a 1995 average refinery price to end user, without taxes adjusted to 1998 dollars). The yearly fuel savings were then discounted by 7 percent to the first year of Phase 2 regulation, for each Class. The yearly results were totaled and then divided by an annualized factor to yield the uniform annualized fuel savings. The fuel savings for each engine class was calculated for the production years of 2010 and 2025. The average of these two values was utilized as the average fuel savings per engine per class per year as is shown in Table 6.

The average resultant cost per engine class is calculated by subtracting the average fuel savings from the average cost, see Table 6. See Chapter 7 of the RIA for more details of this analysis.

TABLE 6.—ENGINE YEARLY FUEL SAVINGS AND RESULTANT COST PER ENGINE, ENGINE COSTS BASED ON UNIFORM ANNUALIZED COSTS [1998\$]

Class	Cost per engine	Savings per engine	Resultant cost per engine
I	\$19.63	\$14.22	\$5.41
II	12.64	55.72	(\$43.08)

b. Cost-Effectiveness

EPA has estimated the cost-effectiveness (i.e., the cost per ton of emission reduction) of the HC+NO_x standard over the typical lifetime of the nonhandheld equipment that would be covered by today's rule. EPA has examined the cost-effectiveness by performing a nationwide cost-

effectiveness analysis in which the net present value of the cost of compliance per year is divided by the fleet turnover. The resultant cost-effectiveness is \$852 cost/ton HC+NO_x without fuel savings and –\$507 with fuel savings. Chapter 7 of the RIA contains a more detailed discussion of the cost-effectiveness analysis.

The overall cost-effectiveness of this rule on HC+NO_x emission reductions, with fuel savings, is shown in Table 7. Table 7 contains the cost effectiveness of other nonroad rulemakings, which reflect fuel savings, to which the cost-effectiveness of this rulemaking can be compared.

TABLE 7.—COST-EFFECTIVENESS OF THE PHASE 2 STANDARDS WITH FUEL SAVINGS COMPARED TO OTHER NONROAD RULES

Standard	NPV cost/NPV ton (With fuel savings)	Pollutants
Phase 2 Small SI Nonhandheld Engines <19 kW Phase 2	–\$507	HC+NO _x
Small SI Engines <19 kW Phase 1	217	HC+NO _x
Spark Ignition Marine Engines	1000	HC

TABLE 7.—COST-EFFECTIVENESS OF THE PHASE 2 STANDARDS WITH FUEL SAVINGS COMPARED TO OTHER NONROAD RULES—Continued

Standard	NPV cost/ NPV ton (With fuel savings)	Pollutants
Nonroad CI Tier 2/3 Standards	410–650	HC+NO _x

Note: Not all in the same year dollars Cost Per Engine and Cost-Effectiveness.

IV. Public Participation

The process for developing this final rule provided several opportunities for formal public comment. EPA published an Advance Notice of Proposed Rulemaking (ANPRM) in March 1997 (see 62 FR 14740, March 27, 1997) which announced the signing of two Statements of Principles (SOPs) with the small engine industry and several other interested parties. The ANPRM and included SOPs outlined programs which would increase the stringency of the small engine regulations compared to Phase 1 rules. Comments were received in response to this ANPRM which, in combination with the programs outlined in the ANPRM, formed the basis of the Notice of Proposed Rulemaking (NPRM) which was published in January 1998 (63 FR 3950, January 27, 1998). A public hearing was held on February 11, 1998 during which oral testimony was received on the proposal. Written comments were received during the formal comment period for the proposal and some additional written comments were received after the formal comment period closed. To expand upon comments received during the comment period and to address specific questions EPA had of the industry regarding technical feasibility and cost of some options for the final standards, EPA also solicited and received additional information after the close of the formal comment period and participated in a number of phone conversations and meetings with industry representatives for this purpose. All of this information including documentation of phone calls and meetings has been included in the docket for this final rule. Since considerable information was received after the formal comment period closed, a notice of availability of this supplemental information was also published on December 1, 1998 (63 FR 66081) alerting interested parties to the availability of this supplemental information. All information received, regardless of the date of receipt, was, to the maximum extent possible, considered in the development of this final rule. EPA has prepared a detailed

Summary and Analysis of Comments document which describes the comments received since the publication of the NPRM and presents the Agency's response to each of these comments. The Summary and Analysis of Comments document is available in the docket for this rule.

V. Administrative Requirements

A. Administrative Designation and Regulatory Analysis

Under Executive Order 12866, the Agency must assess whether this regulatory action is "significant" and therefore subject to Office of Management and Budget (OMB) review and the requirements of the Executive Order (58 FR 51735, Oct. 4, 1993). The order defines "significant regulatory action" as any regulatory action 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.

Pursuant to the terms of Executive Order 12866, EPA has determined that this rulemaking is a "significant regulatory action" because the new standards and other regulatory provisions, are expected to have an annual effect on the economy in excess of \$100 million. A Regulatory Impact Analysis has been prepared and is available in the docket associated with this rulemaking. This action was submitted to OMB for review as required by Executive Order 12866. Any written comments from OMB are in the public docket for this rulemaking.

B. Regulatory Flexibility

EPA has determined that it is not necessary to prepare a regulatory flexibility analysis in connection with this final rule. The Agency has also determined that this rule will not have a "significant impact on a substantial number of small entities."

EPA has identified industries that are subject to this rule and has contacted small entities and small entity representatives to gain a better understanding of potential impacts of the Phase 2 program on their businesses. This information was useful in estimating potential impacts of this rule on affected small entities, the details of which are more fully discussed in Chapter 8 of the Final RIA. Small not-for-profit organizations and small governmental jurisdictions are not expected to be impacted by this proposal. Thus EPA's impact analysis focuses on small businesses. For purposes of the impact analysis, "small business" is defined by number of employees, according to published Small Business Administration (SBA) definitions.

The Agency desires to minimize, to the extent appropriate, impacts on those companies which may be adversely affected, and to ensure that the emissions standards are achievable. Thus, flexibility provisions for the rule (discussed in section II.E.) were developed based on analysis of information gained through discussions with potentially affected small entities as well as analysis of other sources of information, as detailed in Chapter 8 of the Final RIA. Many of the flexibilities in today's rule should benefit both engine and equipment manufacturers qualifying as small.

The economic impact of the final rule on small engine and equipment manufacturers was evaluated using a "sales test" approach which calculates annualized compliance costs as a function of sales revenue. The ratio is an indication of the severity of the potential impacts. EPA expects that, at worst, four small engine manufacturers and 70 small equipment manufacturers would be impacted by more than one percent of their sales revenue. EPA

guidance provides that if fewer than 100 small entities are affected by more than one percent of their annual sales income, this does not amount to a "significant impact on a substantial number" of small entities. This base case analysis assumes that no manufacturers take advantage of the flexibilities being offered and that there would be no passthrough of costs in price increases, and can therefore be characterized as depicting worst-case impacts. Thus, EPA expects today's rule to have a minimal impact on small business entities.

However, EPA is finalizing a number of flexibilities to further reduce the burden of compliance on small-volume engine or equipment manufacturers and small-volume product lines. The Agency received a number of comments from engine manufacturers which were generally supportive of the flexibilities initially proposed, but which suggested changes in production caps and other provisions. EPA has incorporated many of these suggested changes to the extent possible, keeping in mind equity and air quality considerations. Given the flexibilities being afforded to the engine and equipment manufacturers, the results of the analysis suggest that of those small entities analyzed, only three small business engine manufacturers and three small business equipment manufacturers would likely experience an impact of greater than one percent of their sales revenue. These six companies represent only about three percent of the total number of small business manufacturers on which the analysis was based. Other outreach activities have also indicated that the impact of today's rule can be minimized given sufficient lead time to incorporate the new technology with normal model changes. Again, the Agency has not attempted to quantify the beneficial impact on small business manufacturers of the lead time provided (which can include delaying the impact of these rules up until the 2010 model year).

Some, but not all, of the flexibility provisions were considered in the

impact assessment on small entities (see Chapter 8 of the Final RIA). Those flexibilities not considered include a hardship relief provision (described in section II.E.), which was developed to further ensure the standards can be achieved. Although it is difficult to project utilization of such a provision, EPA expects that it could further reduce the economic impact of the rule.

The results of the impact analysis show minimal impacts on small businesses. EPA expects that such impacts will be negligible if small companies take advantage of the above mentioned flexibilities, and if companies are able to pass through most of their costs through to customers, as was considered likely by most small companies contacted. Many of these entities are involved in filling niche markets, and are thus in a better position to pass these costs along to the ultimate consumers. Furthermore, EPA's outreach activities with small entities indicated that many engine and equipment manufacturers have already begun the switch from side-valve engine technology to producing or using overhead valve engine technology for reasons other than today's rule. They should therefore not incur substantial additional costs as a result of this program. The ample lead time being afforded by today's rule should also allow for an orderly transition to the more advanced technology.

C. Paperwork Reduction Act

The information collection requirements in this rule will be submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* An Information Collection Request (ICR) document has been prepared by EPA and a copy may be obtained from Sandy Farmer by mail at OPPE Regulatory Information Division; U.S. Environmental Protection Agency (2137); 401 M St., SW., Washington, DC 20460, by e-mail at farmer.sandyepa@mail.epa.gov, or by calling (202) 260-2740. A copy may also

be downloaded off the internet at <http://www.epa.gov/icr>. The information requirements are not effective until OMB approves them.

The information planned to be collected via this final rule is necessary to assure that the engine manufacturers required to seek certification of their engines have fulfilled all the essential requirements of these regulations. In particular, this information will document the design of the engine for which certification is sought, the type(s) of equipment in which it is intended to be used and the emission performance of these engines based upon testing performed by or on behalf of the engine manufacturer. Additional, essential information is necessary to document the results of testing performed by the manufacturer under a mandated production line testing program to determine that the engines, as manufactured continue to have acceptable emission performance. Finally, if the manufacturer elects to conduct testing of in-use engines under a voluntary in-use testing program adopted in these final regulations, information is necessary to document the results of that in-use testing program.

Table 8 provides a listing of this rulemaking's information collection requirements along with the appropriate information collection request (ICR) numbers. The cost of this burden has been incorporated into the cost estimate for this rule. The Agency has estimated that the public reporting burden for the collection of information required under this rule would average approximately 156,816 hours annually for the industry at an estimated annual cost of \$9,489,386. The hours spent by an individual manufacturer on information collection activities in any given year would be highly dependent upon manufacturer specific variables, such as the number of engine families, production changes, emission defects etc.

Table 8: Public Reporting Burden

Type of information	OMB Control No.
Certification	2060-0338
Averaging, banking and trading	2060-0338
Production line testing	N/A
Pre-certification and testing exemption	2060-0007
Engine exclusion determination	2060-0124
Emission defect information	2060-0048
Importation of nonconforming engines	2060-0294

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15.

D. Unfunded Mandates Reform Act

Section 202 of the Unfunded Mandates Reform Act of 1995 ("Unfunded Mandates Act") requires that the Agency prepare a budgetary impact statement before promulgating a rule that includes a Federal mandate that may result in expenditure by State, local, and tribal governments, in aggregate, or by the private sector, of \$100 million or more in any one year. Section 203 requires the Agency to establish a plan for obtaining input from and informing, educating, and advising small governments that may be significantly or uniquely affected by the rule.

Under section 205 of the Unfunded Mandates Act, the Agency must identify and consider a reasonable number of regulatory alternatives before promulgating a rule for which a budgetary impact statement must be prepared. The Agency must select from those alternatives the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule, unless the Agency explains why this alternative is not selected or the selection of this alternative is inconsistent with law.

Because this final rule is estimated to result in the expenditure by State, local and tribal governments or the private sector of greater than \$100 million in any one year, the Agency has prepared a budgetary impact statement and has addressed the selection of the least costly, most cost-effective or least burdensome alternative. While this rule

does not impose enforceable obligations on state, local, and tribal governments, which do not produce small SI nonhandheld engines or equipment, EPA has estimated the rule to cost the private sector an annualized cost of \$230 million per year. However, the Agency has appropriately considered cost issues in developing this rule as required by section 213(a)(3) of the Clean Air Act, and has designed the rule such that it will in EPA's view be a cost-effective program. Because small governments would not be significantly or uniquely affected by this rule, the Agency is not required to develop a plan with regard to small governments.

The unfunded mandates statement under section 202 must include: (1) A citation of the statutory authority under which the rule is adopted; (2) an assessment of the costs and benefits of the rule including the effect of the mandate on health, safety and the environment; (3) where feasible, estimates of future compliance costs and disproportionate impacts upon particular geographic or social segments of the nation or industry; (4) where relevant, an estimate of the effect on the national economy; and (5) a description of the EPA's consultation with state, local, and tribal officials. Since this rule is estimated to impose costs to the private sector in excess of \$100 million per year, it is considered a significant regulatory action. Therefore, EPA has prepared the following statement with respect to UMRA sections 202 through 205.

1. Statutory Authority

This rule establishes standards for emissions of HC+NO_x and CO from small nonroad SI nonhandheld engines pursuant to section 213 of the Clean Air Act. Section 216 defines the terms "nonroad engine" and "nonroad vehicle." Section 213(a)(3) requires these standards to achieve the greatest degree of emission reduction achievable through the application of technology which the Administrator determines will be available for the engines or vehicles to which such standards apply, giving appropriate consideration to the cost of applying such technology within the period of time available to manufacturers and to noise, energy, and safety factors associated with the application of such technology. Section 213(b) requires the standards to take effect at the earliest possible date considering the lead time necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period and energy and safety. Section 213(d)

provides that the standards shall be subject to sections 206, 207, 208 and 209 of the CAA, with such modifications of the applicable regulations implementing such sections as the Administrator deems appropriate, and shall be enforced in the same manner as standards prescribed under section 202. Therefore, the statutory authority for this rule is as follows: sections 203, 204, 205, 206, 207, 208, 209, 213, 215, 216, and 301(a) of the Clean Air Act, as amended. Moreover, this rule is being issued pursuant to a court order entered in *Sierra Club v. Browner*, No. 93-0124 and consolidated cases (D.D.C.).

2. Social Costs and Benefits

The social costs and benefits of this rule are discussed in detail in sections III.A. and III.B. of this notice, and in Chapters 3 through 8 of the Final RIA. Those discussions are incorporated into this statement by reference.

3. Effects on the National Economy

As stated in the UMRA, macroeconomic effects tend to be measurable, in nationwide economic models, only if the economic effect of the regulation reaches 0.25 to 0.5 percent of gross domestic product (in the range of \$15 billion to \$30 billion). A regulation with a smaller aggregate effect is highly unlikely to have any measurable impact in macroeconomic terms unless it is highly focused on a particular geographic region or economic sector. Because the economic impact of the small SI nonhandheld engine Phase 2 rule is far less than these thresholds, no estimate of this rule's effect on the national economy has been conducted.

4. Consultation with Government Officials

Today's rule does not create a mandate on state, local or tribal governments, since it does not impose any enforceable duties on these entities which do not produce small SI nonhandheld engines or equipment. Thus, EPA did not consult with state, local or tribal governments in the context of discussing mandated costs that would apply to such governments. However, EPA did consult with state governmental representatives, and with representatives of associations representing state air regulatory agencies, in the contexts of developing the most stringent achievable regulations and of addressing state ozone attainment needs. The consulted entities include the California ARB, the Wisconsin DNR, and NESCAUM. These consultations are documented in the

record for this rule, and are reflected and discussed in the SOPs, the ANPRM, the NPRM, the Notice of Availability, and today's final rulemaking notice.

5. Regulatory Alternatives Considered

The Clean Air Act requires that standards under section 213(a)(3) result in the greatest degree of emission reductions achievable from available technology, considering costs, lead time, noise, energy and safety factors. While EPA has substantial discretion to weigh these different factors in setting standards under section 213(a)(3), EPA may not simply select the least costly, most cost-effective, or least burdensome method of achieving the objectives of the rule if such method does not obtain the greatest achievable emission reduction. In order to ensure the cost-effectiveness of this rule and still fulfill the intent of the Clean Air Act, EPA has adopted numerous flexibility provisions that reduce the burden of the Phase 2 program for small volume manufacturers and manufacturers of small volume models and families. These provisions are discussed in section II.E. of today's notice. Moreover, the technological options considered for the rule's standards and related provisions are discussed in section II.A. of the notice. Section II.B. discusses the ABT program adopted for the final rule, and section II.D. discusses the compliance program for Phase 2 nonhandheld engines. In EPA's view, these discussions demonstrate that the Agency is adopting the most cost-effective rule allowed under section 213(a)(3) for nonhandheld Phase 2 engines, and the Agency incorporates them into this statement.

E. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. This rule is a "major rule" as defined by 5 U.S.C. 804(2). This rule will be effective June 1, 1999.

F. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law No. 104-113, Section 12(d) (15 U.S.C. 272 note), directs EPA to use voluntary consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This final rule involves technical standards. While commenters suggested the use of ISO 8178 test procedures for measuring emissions, the Agency has decided not to rely on the ISO procedures in this rulemaking. The Agency has determined that these procedures would be impractical because they rely too heavily on reference testing conditions. Since the test procedures in these regulations need to be used not only for certification, but also for production line testing, selective enforcement audits, and in-use testing, they must be broadly based. In-use testing is best done outside tightly controlled laboratory conditions so as to be representative of in-use conditions. EPA has determined that the ISO procedures are not sufficiently broadly usable in their current form for this program, and therefore cannot be adopted by reference. EPA has instead chosen to continue to rely on the procedures outlined in 40 CFR Part 90. EPA is hopeful that future ISO test procedures will be developed that are usable for the broad range of testing needed, and that such procedures could then be adopted by reference.

G. Executive Order 13045

Executive Order 13045, entitled "Protection of Children from Environmental Health Risks and Safety Risks" (62 FR 19885, April 23, 1997), applies to any rule that: (1) Was initiated after April 21, 1997 or for which a Notice of Proposed Rulemaking was published after April 21, 1998; (2) is determined to be "economically significant" as defined under Executive Order 12866; and (3) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If

the regulatory action meets all three criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children; and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This final rule is not subject to Executive Order 13045, because substantive actions were initiated before April 21, 1997 and EPA published a Notice of Proposed Rulemaking before April 21, 1998. Moreover, this rulemaking does not involve risk assessments in which EPA would consider risks to infants and children. This is because today's rule is intended to result in the greatest achievable emissions reductions that are technically feasible, rather than to achieve a threshold of protecting public health and the environment. Therefore, EPA does not have reason to believe this action involves environmental health and safety risks that present a disproportionate risk to children.

H. Executive Order 12875: Enhancing the Intergovernmental Partnership

Under Executive Order 12875, EPA may not issue a regulation that is not required by statute and that creates a mandate upon a State, local or tribal government, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by those governments, or EPA consults with those governments. If EPA complies by consulting, Executive Order 12875 requires EPA to provide to the Office of Management and Budget a description of the extent of EPA's prior consultation with representatives of affected State, local and tribal governments, the nature of their concerns, copies of any written communications from the governments, and a statement supporting the need to issue the regulation. In addition, Executive Order 12875 requires EPA to develop an effective process permitting elected officials and other representatives of State, local and tribal governments "to provide meaningful and timely input in the development of regulatory proposals containing significant unfunded mandates."

Today's rule does not create a mandate on State, local or tribal governments. The rule does not impose any enforceable duties on these entities, which do not produce small SI nonhandheld engines or equipment. Accordingly, the requirements of section 1(a) of Executive Order 12875 do not apply to this rule.

I. Executive Order 13084: Consultation and Coordination With Indian Tribal Governments

Under Executive Order 13084, EPA may not issue a regulation that is not required by statute, that significantly or uniquely affects the communities of Indian tribal governments, and that imposes substantial direct compliance costs on those communities, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by the tribal governments, or EPA consults with those governments. If EPA complies by consulting, Executive Order 13084 requires EPA to provide to the Office of Management and Budget a description of the extent of EPA's prior consultation with representatives of affected tribal governments and a statement supporting the need to issue the regulation. In addition, Executive Order 13084 requires EPA to develop an effective process permitting elected officials and other representatives of Indian tribal governments "to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities."

Today's rule does not significantly or uniquely affect the communities of Indian tribal governments because it imposes no enforceable obligations on them. Accordingly, the requirements of section 3(b) of Executive Order 13084 do not apply to this rule.

VI. Statutory Authority

Authority for the actions set forth in this rule is granted to EPA by sections 202, 203, 204, 205, 206, 207, 208, 209, 213, 215, 216, and 301(a) of the Clean Air Act as amended (42 U.S.C. 7521, 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7547, 7549, 7550, and 7601(a)).

List of Subjects in 40 CFR Part 90

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Imports, Labeling, Nonroad source pollution, Reporting and record keeping requirements, Research, Warranties.

Dated: March 3, 1999.

Carol M. Browner,
Administrator.

For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations is amended as follows:

PART 90—CONTROL OF EMISSIONS FROM NONROAD SPARK-IGNITION ENGINES

1. The authority citation for part 90 continues to read as follows:

Authority: Sections 203, 204, 205, 206, 207, 208, 209, 213, 215, 216, and 301(a) of the Clean Air Act, as amended (42 U.S.C. 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7547, 7549, 7550, and 7601(a)).

Subpart A—General

2. Section 90.1 is amended by removing the period at the end of paragraph (b)(5)(iv) and by adding a semicolon in its place and adding paragraphs (b)(6) and (d) and by revising paragraph (c) to read as follows:

§ 90.1 Applicability.

* * * * *

(b) * * *

(6) Engines that are used exclusively in emergency and rescue equipment where no certified engines are available to power the equipment safely and practically, but not including generators, alternators, compressors or pumps used to provide remote power to a rescue tool. The equipment manufacturer bears the responsibility to ascertain on an annual basis and maintain documentation available to the Administrator that no appropriate certified engine is available from any source.

(c) Engines subject to the provisions of this subpart are also subject to the provisions found in subparts B through M of this part, except that subparts C, H, and M of this part apply only to Phase 2 engines as defined in this subpart.

(d) Certain text in this part is identified as pertaining to Phase 1 or Phase 2 engines. Such text pertains only to engines of the specified Phase. If no indication of Phase is given, the text pertains to all engines, regardless of Phase.

3. Section 90.3 is amended by adding the following definitions in alphabetical order to read as follows:

§ 90.3 Definitions.

* * * * *

Aftertreatment means the passage of exhaust gases through a device or system such as a catalyst whose purpose is to chemically alter the gases prior to their release to the atmosphere.

* * * * *

DF or *df* means deterioration factor.

Eligible production or *U.S. production* means Phase 2 engines produced for purposes of being used in the United States, and includes any engine

exported and subsequently imported in a new piece of equipment, but excludes any engine introduced into commerce, by itself or in a piece of equipment, for use in a state that has established its own emission requirements applicable to such engines pursuant to a waiver granted by EPA under section 209(e) of the Clean Air Act.

Equipment manufacturer means a manufacturer of equipment using engines covered by the provisions of this Part who does not also manufacture engines covered by the provisions of this Part.

* * * * *

Family Emission Limit or *FEL* means an emission level that is declared by the manufacturer to serve in lieu of an emission standard for the purposes of certification, production line testing, and Selective Enforcement Auditing for engines participating in the averaging, banking and trading program. A declared FEL will also serve in lieu of an emission standard where the manufacturer elects to perform voluntary in-use testing under this part. An FEL must be expressed to the same number of decimal places as the applicable emission standard.

* * * * *

HC+NO_x means total hydrocarbons plus oxides of nitrogen.

* * * * *

New Class I engine family means any group of engines that employ a design that is different from engine families that the engine manufacturer has previously certified, and does not include any engine family certified on the basis of carryover data or any engine family that differs from another engine family solely as a result of a running change.

NMHC+NO_x means nonmethane hydrocarbons plus oxides of nitrogen.

* * * * *

Overhead valve engine means an otto-cycle, four stroke engine in which the intake and exhaust valves are located above the combustion chamber within the cylinder head. Such engines are sometimes referred to as "valve-in-head" engines.

Phase 1 engine means any handheld or nonhandheld engine, that was produced under a certificate of conformity issued under the regulations in this part to the standard levels defined for Phase 1.

Phase 2 engine means any nonhandheld engine that was produced under a certificate of conformity under the regulations in this part to the standards defined for Phase 2 engines.

* * * * *

Round, rounded or rounding means, unless otherwise specified, that numbers will be rounded according to ASTM-E29-93a, which is incorporated by reference in this part pursuant to § 90.7.

* * * * *

Side valve engine means an otto-cycle, four stroke engine in which the intake and exhaust valves are located to the side of the cylinder, not within the cylinder head. Such engines are sometimes referred to as "L-head" engines.

Small volume engine family means any nonhandheld engine family whose eligible production in a given model year are projected at the time of certification to be no more than 5,000 engines.

Small volume engine manufacturer means, for nonhandheld engines, any engine manufacturer whose total eligible production of nonhandheld engines are projected at the time of certification of a given model year to be

no more than 10,000 nonhandheld engines.

Small volume equipment manufacturer means, for nonhandheld equipment, any equipment manufacturer whose production of nonhandheld equipment subject to regulation under this part or powered by engines regulated under this part, does not exceed 5,000 pieces for a given model year or annual production period excluding that equipment intended for introduction into commerce for use in a state that has established its own emission requirements applicable to such equipment or engines in such equipment, pursuant to a waiver granted by EPA under section 209(e) of the Clean Air Act.

Small volume equipment model means, for nonhandheld equipment, any unique model of equipment whose production subject to regulations under this part or powered by engines regulated under this part, does not exceed 500 pieces for a given model year or annual production period excluding that equipment intended for

introduction into commerce for use in a state that has established its own emission requirements applicable to such equipment or engines in such equipment, pursuant to a waiver granted by EPA under section 209(e) of the Clean Air Act.

* * * * *

Subpart B—Emission Standards and Certification Provisions

4. Section 90.103 is amended by revising paragraph (a) introductory text, and paragraphs (a)(3) and (a)(5) and by adding paragraphs (a)(6) through (a)(8) to read as follows:

§ 90.103 Exhaust emission standards.

(a) Exhaust emissions for new Phase 1 and Phase 2 nonroad spark ignition engines at or below 19 kilowatts (kW), shall not exceed the following levels. Throughout this part, NMHC+NO_x standards are applicable only to natural gas fueled engines at the option of the manufacturer, in lieu of HC+NO_x standards.

TABLE 1.—PHASE 1 EXHAUST EMISSION STANDARDS
[Grams per kilowatt-hour]

Engine displacement class	Hydrocarbons+oxides of nitrogen (HC+NO _x)	Hydrocarbons	Carbon monoxide	Oxides of nitrogen (NO _x)
I	16.1	.....	519	.....
II	13.4	.....	519	.....
III .....	.....	295	805	5.36
IV .....	.....	241	805	5.36
V .....	.....	161	603	5.36

TABLE 2.—PHASE 2 CLASS I ENGINE EXHAUST EMISSION STANDARDS
[grams per kilowatt-hour]

Engine class	HC+NO _x	NMHC+NO _x	CO	Effective date
I	16.1	14.8	610	August 1, 2007; in addition, any Class I engine family initially produced on or after August 1, 2003 must meet the Phase 2 Class I standards before they may be introduced into commerce.

TABLE 3.—PHASE 2 CLASS II ENGINE EXHAUST EMISSION STANDARDS BY MODEL YEAR
[grams per kilowatt-hour]

Engine Class	Emission requirement	Model Year				
		2001	2002	2003	2004	2005 and later
II	HC +NO _x	18.0	16.6	15.0	13.6	12.1
	NMHC+NO _x	16.7	15.3	14.0	12.7	11.3
	CO	610	610	610	610	610

* * * * *

(3) Notwithstanding paragraph (a)(2) of this section, two stroke engines used to power lawnmowers or other nonhandheld equipment may meet Phase 1 Class III, IV or V standards and

requirements, as appropriate, through model year 2002 subject to the provisions of § 90.107(e), (f) and (h). Such engines shall not be included in any computations of Phase 2 averaging,

banking, or trading credits or eligible production.

* * * * *

(5) Notwithstanding paragraph (a)(2) of this section, engines used exclusively to power products which are used

exclusively in wintertime, such as snowthrowers and ice augers, at the option of the engine manufacturer, need not certify to or comply with standards regulating emissions of HC, NO_x, HC+NO_x or NMHC+NO_x, as applicable. If the manufacturer exercises the option to certify to standards regulating such emissions, such engines must meet such standards. If the engine is to be used in any equipment or vehicle other than an exclusively wintertime product such as a snowthrower or ice auger, it must be certified to the applicable standard regulating emissions of HC, NO_x, HC+NO_x or NMHC+NO_x as applicable.

(6) In lieu of certifying to the applicable Phase 2 standards, small volume engine manufacturers as defined in this part may, at their option, certify their engines families as Phase 1 engines until the 2010 model year. Such engines shall not exceed the applicable Phase 1 standards and are excluded from the averaging, banking and trading program and any related credit calculations. Beginning with the 2010 model year, these engines must meet the applicable Phase 2 standards.

(7) In lieu of certifying to the applicable Phase 2 standards, manufacturers of small volume engine families, as defined in this part may, at their option, certify their small volume engine families as Phase 1 engines until the 2010 model year. Such engines shall not exceed the applicable Phase 1 standards and are excluded from the

averaging, banking and trading program and any related credit calculations. Beginning with the 2010 model year, these engines must meet the applicable Phase 2 standards.

(8) Notwithstanding the standards shown in Table 3 of this section, the HC+NO_x (NMHC+NO_x) standard for Phase 2 Class II side valve engine families with annual production of 1000 or less shall be 24.0 g/kW-hr (22.0 g/kW-hr) for model years 2010 and later. Engines produced subject to this provision may not exceed this standard and are excluded from the averaging, banking and trading program and any related credit calculations.

* * * * *
5. Section 90.104 is amended by adding introductory text and adding paragraphs (d) through (h) to read as follows:

§ 90.104 Compliance with emission standards.

Paragraphs (a) through (c) of this section apply to Phase 1 engines only. Paragraphs (d) through (h) of this section apply only to Phase 2 engines.

* * * * *
(d) The exhaust emission standards (FELs, where applicable) for Phase 2 engines set forth in this part apply to the emissions of the engines for their full useful lives as determined pursuant to § 90.105.

(e) For all Phase 2 engines, if all test engines representing an engine family have emissions, when properly tested

according to procedures in this part, less than or equal to each Phase 2 emission standard (FEL, where applicable) in a given engine class and given model year, when multiplicatively adjusted by the deterioration factor determined in this section, that family complies with that class of emission standards for purposes of certification. If any test engine representing an engine family has emissions adjusted multiplicatively by the deterioration factor determined in this section, greater than any one emission standard (FEL, where applicable) for a given displacement class, that family does not comply with that class of emission standards.

(f) Each engine manufacturer must comply with all provisions of the averaging, banking and trading program outlined in subpart C of this part for each engine family participating in that program.

(g)(1) Small volume engine manufacturers and small volume engine families may, at their option, take deterioration factors for HC+NO_x (NMHC+NO_x) and CO from Table 1 of this section, or they may calculate deterioration factors for HC+NO_x (NMHC+NO_x) and CO according to the process described in paragraph (h) of this section. For technologies that are not addressed in Table 1 of this section, the manufacturer may ask the Administrator to assign a deterioration factor prior to the time of certification.

(2) Table 1 follows:

TABLE 1: NONHANDHELD ENGINE HC+NO_x (NMHC+NO_x) AND CO ASSIGNED DETERIORATION FACTORS FOR SMALL VOLUME MANUFACTURERS AND SMALL VOLUME ENGINE FAMILIES

Engine class	Side valve engines		Overhead valve engines		Engines with aftertreatment
	HC+NO _x (NMHC+NO _x)	CO	HC+NO _x (NMHC+NO _x)	CO	
Class I	2.1	1.1	1.5	1.1	Dfs must be calculated using the formula in § 90.104(g)(3).
Class II	1.6	1.1	1.4	1.1	

(3) Formula for calculating deterioration factors for engines with aftertreatment:

$$DF = [(NE * EDF) - (CC * F)] / (NE - CC)$$

Where:

DF = deterioration factor

NE = new engine emission levels prior to the catalyst (g/kW-hr)

EDF = deterioration factor for engines without catalyst as shown in Table 1

CC = amount converted at 0 hours in g/kW-hr

F = 0.8 for HC (NMHC) and 0.0 for NO_x for Class I and II engines

F = 0.8 for CO for all classes of engines

(h)(1) Manufacturers shall obtain an assigned df or calculate a df, as appropriate, for each regulated pollutant for all Phase 2 engine families. Such dfs shall be used for certification, production line testing, and Selective Enforcement Auditing.

(2) For engines not using assigned dfs from Table 1 of this section, dfs shall be determined as follows:

(i) On at least one test engine representing the configuration chosen to be the most likely to exceed HC+NO_x (NMHC+NO_x) emission standards, (FELs where applicable), and

constructed to be representative of production engines pursuant to § 90.117, conduct full Federal test procedure emission testing pursuant to the regulations of subpart E of this part at the number of hours representing stabilized emissions pursuant to § 90.118. If more than one engine is tested, average the results and round to the same number of decimal places contained in the applicable standard, expressed to one additional significant figure;

(ii) Conduct such emission testing again following aging the engine. The aging procedure should be designed to

allow the manufacturer to appropriately predict the in-use emission deterioration expected over the useful life of the engine, taking into account the type of wear and other deterioration mechanisms expected under typical consumer use which could affect emissions performance. If more than one engine is tested, average the results and round to the same number of decimal places contained in the applicable standard, expressed to one additional significant figure;

(iii) Divide the full useful life emissions (average emissions, if applicable) for each regulated pollutant by the stabilized emissions (average emissions, if applicable) and round to two significant figures. The resulting number shall be the df, unless it is less than 1.0, in which case the df shall be 1.0.

(iv) At the manufacturer's option additional emission test points can be scheduled between the stabilized emission test point and the full useful life test period. If intermediate tests are scheduled, the test points must be evenly spaced over the full useful life period (plus or minus 2 hours) and one such test point shall be at one-half of full useful life (plus or minus 2 hours). For each pollutant HC+NO_x (NMHC+NO_x) and CO, a line must be fitted to the data points treating the initial test as occurring at hour zero, and using the method of least-squares. The deterioration factor is the calculated emissions durability period divided by the calculated emissions at zero hours.

(3) EPA may reject a df if it has evidence that the df is not appropriate for that family within 30 days of receipt from the manufacturer. The manufacturer must retain actual emission test data to support its choice of df and furnish that data to the Administrator upon request. Manufacturers may request approval by the Administrator of alternate procedures for determining deterioration. Any submitted df not rejected by EPA within 30 days shall be deemed to have been approved.

(4) Calculated deterioration factors may cover families and model years in addition to the one upon which they were generated if the manufacturer submits a justification acceptable to the Administrator in advance of certification that the affected engine families can be reasonably expected to have similar emission deterioration characteristics.

(5) Engine families that undergo running changes need not generate a new df if the manufacturer submits a justification acceptable to the Administrator concurrent with the

running change that the affected engine families can be reasonably expected to have similar emission deterioration characteristics.

6. Section 90.105 is revised to read as follows:

§ 90.105 Useful life periods for Phase 2 engines.

(a) Manufacturers shall declare the applicable useful life category for each engine family at the time of certification as described in this section. Such category shall be the category which most closely approximates the expected useful lives of the equipment into which the engines are anticipated to be installed as determined by the engine manufacturer. Manufacturers shall retain data appropriate to support their choice of useful life category for each engine family. Such data shall be furnished to the Administrator upon request.

(1) For nonhandheld engines: Manufacturers shall select a useful life category from Table 1 of this section at the time of certification.

(2) Table 1 follows:

TABLE 1: USEFUL LIFE CATEGORIES FOR NONHANDHELD ENGINES [HOURS]

Class I	125	250	500
Class II	250	500	1000

(3) [Reserved]

(4) [Reserved]

(5) Data to support a manufacturer's choice of useful life category, for a given engine family, may include but are not limited to:

(i) Surveys of the life spans of the equipment in which the subject engines are installed;

(ii) Engineering evaluations of field aged engines to ascertain when engine performance deteriorates to the point where usefulness and/or reliability is impacted to a degree sufficient to necessitate overhaul or replacement;

(iii) Warranty statements and warranty periods;

(iv) Marketing materials regarding engine life;

(v) Failure reports from engine customers; and

(vi) Engineering evaluations of the durability, in hours, of specific engine technologies, engine materials or engine designs.

(b) [Reserved]

7. Section 90.106 is amended by revising paragraph (a) and adding new paragraph (b)(3) to read as follows:

§ 90.106 Certificate of conformity.

(a)(1) Except as provided in § 90.2(b), every manufacturer of new engines

produced during or after model year 1997 must obtain a certificate of conformity covering such engines; however, engines manufactured during an annual production period beginning prior to September 1, 1996 are not required to be certified.

(2) Except as required in paragraph (b)(3) of this section, Class II engines manufactured during an annual production period beginning prior to September 1, 2000 are not required to meet Phase 2 requirements.

(b) * * *
(3) Manufacturers who commence an annual production period for a Class II engine family between January 1, 2000 and September 1, 2000 must meet Phase 2 requirements for that family only if that production period will exceed 12 months in length.

* * * * *
8. Section 90.107 is amended by removing the period at the end of paragraph (d)(5) and adding a semicolon in its place, by removing "and" at the end of paragraph (d)(9), by removing the period at the end of paragraph (d)(10) and adding a semicolon in its place, and by adding new paragraph (d)(11) to read as follows:

§ 90.107 Application for certification.

* * * * *

(d) * * *

(11) This paragraph (d)(11) is applicable only to Phase 2 engines.

(i) Engine manufacturers participating in the averaging, banking and trading program as described in subpart C of this part shall declare the applicable Family Emission Limit (FEL) for HC+NO_x (NMHC+NO_x).

(ii) Provide the applicable useful life as determined under § 90.105.

* * * * *

9. Section 90.108 is amended by adding paragraphs (c) and (d) to read as follows:

§ 90.108 Certification.

* * * * *

(c) For certificates issued for engine families included in the averaging, banking and trading program as described in subpart C of this part:

(1) Failure to comply with all applicable averaging, banking and trading provisions in this part will be considered to be a failure to comply with the terms and conditions upon which the certificate was issued, and the certificate may be determined to be void *ab initio*.

(2) The manufacturer shall bear the burden of establishing to the satisfaction of the Administrator that the conditions upon which the certificate was granted were satisfied or waived.

(d) The Administrator may, upon request by a manufacturer, waive any requirement of this part otherwise necessary for the issuance of a certificate. The Administrator may set such conditions in a certificate as he or she deems appropriate to assure that the waived requirements are either satisfied or are demonstrated, for the subject engines, to be inappropriate, irrelevant or met by the application of a different requirement under this chapter. The Administrator may indicate on such conditional certificates that failure to meet these conditions may result in suspension or revocation or the voiding *ab initio* of the certificate.

10. Section 90.113 is amended by revising the section heading and adding two sentences to the beginning of paragraph (a) to read as follows:

§ 90.113 In-use testing program for Phase 1 engines.

(a) This section applies only to Phase 1 engines. In-use testing provisions for Phase 2 engines are found in subpart M of this part. * * *

* * * * *

11. Section 90.114 is amended by removing "and" at the end of paragraph (c)(9), by removing the period at the end of paragraph (c)(10) and adding a semicolon in its place and by adding new paragraphs (c)(11) and (f) to read as follows:

§ 90.114 Requirement of certification—engine information label.

* * * * *

(c) * * *

(11) For Phase 2 engines, the useful life category as determined by the manufacturer pursuant to § 90.105. Such useful life category shall be shown by one of the following statements to be appended to the statement required under paragraph (c)(7) of this section:

(i) "EMISSIONS COMPLIANCE PERIOD: [useful life] HOURS"; or

(ii) "EMISSIONS COMPLIANCE PERIOD: CATEGORY [fill in C, B or A as indicated and appropriate from the tables in § 90.105], REFER TO OWNER'S MANUAL FOR FURTHER INFORMATION";

* * * * *

(f) Manufacturers electing to use the labeling language of paragraph (c)(11)(ii) of this section must provide in the documents intended to be conveyed to the ultimate purchaser, the statement:

(1) For nonhandheld engines: The Emissions Compliance Period referred to on the Emissions Compliance label indicates the number of operating hours for which the engine has been shown to meet Federal emission requirements. For engines less than 225 cc

displacement, Category C=125 hours, B=250 hours and A=500 hours. For engines of 225 cc or more, Category C=250 hours, B=500 hours and A=1000 hours.

(2) [Reserved]

(3) The manufacturer must provide, in the same document as the statement in paragraph (f)(1) of this section, a statement of the engine's displacement or an explanation of how to readily determine the engine's displacement. The Administrator may approve alternate language to the statement in paragraph (f)(1) of this section, provided that the alternate language provides the ultimate purchaser with a clear description of the number of hours represented by each of the three letter categories for the subject engine's displacement.

12. Section 90.116 is amended by revising paragraph (d)(6) and (d)(7) and adding paragraphs (d)(8) through (d)(10) to read as follows:

§ 90.116 Certification procedure—determining engine displacement, engine class, and engine families.

* * * * *

(d) * * *

(6) The location of valves, where applicable, with respect to the cylinder (e.g. side valves or overhead valves);

(7) The number of catalytic converters, location, volume and composition;

(8) The thermal reactor characteristics;

(9) The fuel required (e.g. gasoline, natural gas, LPG); and

(10) The useful life category.

* * * * *

13. Section 90.117 is amended by revising paragraph (a) to read as follows:

§ 90.117 Certification procedure—test engine selection.

(a) For Phase 1 engines, the manufacturer must select, from each engine family, a test engine that the manufacturer determines to be most likely to exceed the emission standard. For Phase 2 engines, the manufacturer must select, from each engine family, a test engine of a configuration that the manufacturer determines to be most likely to exceed the HC+NO_x (NMHC+NO_x) Family Emission Limit (FEL), or HC+NO_x (NMHC+NO_x) standard if no FEL is applicable.

* * * * *

14. Section 90.118 is amended by revising the section heading and adding a new paragraph (e) to read as follows:

§ 90.118 Certification procedure—service accumulation and usage of deterioration factors.

* * * * *

(e) For purposes of establishing whether Phase 2 engines comply with applicable exhaust emission standards or FELs, the test results for each regulated pollutant as measured pursuant to § 90.119 shall be multiplied by the applicable df determined under § 90.104 (g) or (h). The product of the two numbers shall be rounded to the same number of decimal places contained in the applicable standard, and compared against the applicable standard or FEL, as appropriate.

15. Section 90.120 is amended by adding paragraph (c) to read as follows:

§ 90.120 Certification procedure—use of special test procedures.

* * * * *

(c) Optional procedures approved during Phase 1 can be carried over to Phase 2, following advance approval by the Administrator, to the extent the alternate procedure continues to yield results equal to the results from the specified test procedures in subpart E of this part.

16. Section 90.122 is amended by revising the first sentence of paragraph (a) and adding paragraph (d)(4) as follows:

§ 90.122 Amending the application and certificate of conformity.

(a) The engine manufacturer must notify the Administrator when either an engine is to be added to a certificate of conformity, an FEL is to be changed, or changes are to be made to a product line covered by a certificate of conformity.

* * * * *

(d) * * *

(4) If the Administrator determines that a revised FEL meets the requirements of this subpart and the Act, the appropriate certificate of conformity will be amended, or a new certificate will be issued to reflect the revised FEL. The certificate of conformity is revised conditional upon compliance with § 90.207(b).

* * * * *

17. Subpart C, which was formerly reserved, is added to part 90 to read as follows:

Subpart C—Certification Averaging, Banking, and Trading Provisions

Sec.	
90.201	Applicability.
90.202	Definitions.
90.203	General provisions.
90.204	Averaging.
90.205	Banking.
90.206	Trading.
90.207	Credit calculation and manufacturer compliance with emission standards.
90.208	Certification.

- 90.209 Maintenance of records.
 90.210 End-of-year and final reports.
 90.211 Request for hearing.

Subpart C—Certification Averaging, Banking, and Trading Provisions

§ 90.201 Applicability.

The requirements of this subpart C are applicable to all Phase 2 spark-ignition engines subject to the provisions of subpart A of this part except as provided in § 90.103(a). These provisions are not applicable to any Phase 1 engines. Participation in the averaging, banking and trading program is voluntary, but if a manufacturer elects to participate, it must do so in compliance with the regulations set forth in this subpart. The provisions of this subpart are applicable for HC+NO_x (NMHC+NO_x) emissions but not for CO emissions.

§ 90.202 Definitions.

The definitions in subpart A of this part apply to this subpart. The following definitions also apply to this subpart:

Averaging means the exchange of emission credits between engine families within a given manufacturer's product line.

Banking means the retention of emission credits by the manufacturer generating the emission credits or obtaining such credits through trading, for use in future model year averaging or trading as permitted in this part.

Emission credits represent the amount of emission reduction or exceedance, by an engine family, below or above the applicable HC+NO_x (NMHC+NO_x) emission standard, respectively. FELs below the standard create "positive credits," while FELs above the standard create "negative credits." In addition, "projected credits" refer to emission credits based on the projected applicable production volume of the engine family. "Reserved credits" are emission credits generated within a model year waiting to be reported to EPA at the end of the model year. "Actual credits" refer to emission credits based on actual applicable production volume as contained in the end-of-year reports submitted to EPA. Some or all of these credits may be revoked if EPA review of the end-of-year reports or any subsequent audit action(s) reveals problems or errors of any nature with credit computations.

Trading means the exchange of emission credits between manufacturers.

§ 90.203 General provisions.

(a) The certification averaging, banking, and trading provisions for HC+NO_x and NMHC+NO_x emissions

from eligible engines are described in this subpart.

(b) An engine family may use the averaging, banking and trading provisions for HC+NO_x and NMHC+NO_x emissions if it is subject to regulation under this part with certain exceptions specified in paragraph (c) of this section. HC+NO_x and NMHC+NO_x credits shall be interchangeable subject to the limitations on credit generation, credit usage, and other provisions described in this subpart.

(c) A manufacturer shall not include in its calculation of credit generation and may exclude from its calculation of credit usage, any new engines:

(1) Which are intended to be exported, unless the manufacturer has reason or should have reason to believe that such engines have been or will be imported in a piece of equipment; or

(2) Which are subject to state engine emission standards pursuant to a waiver granted by EPA under section 209(e) of the Act, unless the manufacturer demonstrates to the satisfaction of the Administrator that inclusion of these engines in averaging, banking and trading is appropriate.

(d) For an engine family using credits, a manufacturer may, at its option, include its entire production of that engine family in its calculation of credit usage for a given model year.

(e)(1) A manufacturer may certify engine families at Family Emission Limits (FELs) above or below the applicable emission standard subject to the limitation in paragraph (f) of this section, provided the summation of the manufacturer's projected balance of credits from all credit transactions for all engine classes in a given model year is greater than or equal to zero, as determined under § 90.207.

(2) A manufacturer of an engine family with an FEL exceeding the applicable emission standard must obtain positive emission credits sufficient to address the associated credit shortfall via averaging, banking, or trading.

(3) An engine family with an FEL below the applicable emission standard may generate positive emission credits for averaging, banking, or trading, or a combination thereof.

(4) In the case of a Selective Enforcement Audit (SEA) failure, credits may be used to cover subsequent production of engines for the family in question if the manufacturer elects to recertify to a higher FEL. Credits may not be used to remedy a nonconformity determined by an SEA, except that the Administrator may permit the use of credits to address a nonconformity determined by an SEA where the use of

such credits is one component of a multi-part remedy for the previously produced engines and the remedy, including the use of credits and the quantity of credits being used, is such that the Administrator is satisfied that the manufacturer has strong and lasting incentive to accurately verify its new engine emission levels and will set or reset its FELs for current and future model years so that production line compliance is assured.

(5) In the case of a production line testing (PLT) failure pursuant to subpart H of this part, a manufacturer may revise the FEL based upon production line testing results obtained under subpart H of this part and upon Administrator approval pursuant to § 90.122(d). The manufacturer may use credits to cover both past production and subsequent production of the engines as needed as allowed under § 90.207(c).

(f) No Phase 2 engine family may have a HC + NO_x FEL that is greater than 32.2 g/kW-hr for Class I engines and 26.8 g/kW-hr for Class II engines.

(g)(1) Credits generated in a given model year by an engine family subject to the Phase 2 emission requirements may only be used in averaging, banking or trading, as appropriate, for any other engine family for which the Phase 2 requirements are applicable. Credits generated in one model year may not be used for prior model years, except as allowed under § 90.207(c).

(2) For the 2005 model year and for each subsequent model year, manufacturers of Class II engines must provide a demonstration that the production weighted average FEL for HC+NO_x (including NMHC+NO_x FELs), for all of the manufacturer's Class II engines, will not exceed 13.6 g/kW-hr for the 2005 model year, 13.1 g/kW-hr for the 2006 model year and 12.6 g/kW-hr for the 2007 and each subsequent Phase 2 model year. Such demonstration shall be subject to the review and approval of the Administrator, shall be provided at the time of the first Class II certification of that model year and shall be based on projected eligible production for that model year.

(h) Manufacturers must demonstrate compliance under the averaging, banking, and trading provisions for a particular model year by 270 days after the end of the model year. Except as provided in § 90.207(c), an engine family generating negative credits for which the manufacturer does not obtain or generate an adequate number of positive credits by that date from the same or previous model year engines will violate the conditions of the

certificate of conformity. The certificate of conformity may be voided *ab initio* pursuant to § 90.123 for this engine family.

§ 90.204 Averaging.

(a) Negative credits from engine families with FELs above the applicable emission standard must be offset by positive credits from engine families having FELs below the applicable emission standard, as allowed under the provisions of this subpart. Averaging of credits in this manner is used to determine compliance under § 90.207(b).

(b) Cross-class averaging of credits is allowed across all classes of nonroad spark-ignition nonhandheld engines at or below 19 kW.

(c) Credits used in averaging for a given model year may be obtained from credits generated in the same model year by another engine family, credits banked in previous model years, or credits of the same or previous model year obtained through trading. The restrictions of this paragraph notwithstanding, credits from a given model year may be used to address credit needs of previous model year engines as allowed under § 90.207(c).

(d) The use of credits generated under the early banking provisions of § 90.205(b) is subject to regulations under this subpart.

§ 90.205 Banking.

(a)(1) Beginning August 1, 2007, a manufacturer of a Class I engine family with an FEL below the applicable emission standard for a given model year may bank credits in that model year for use in averaging and trading. For new Class I engine families initially produced during the period starting August 1, 2003 through July 31, 2007, a manufacturer of a Class I engine family with an FEL below the applicable emission standard for a given model year may bank credits in that model year for use in averaging and trading.

(2) [Reserved]

(3) Beginning with the 2001 model year, a manufacturer of a Class II engine family with an FEL below the applicable emission standard for a given model year may bank credits in that model year for use in averaging and trading.

(4) [Reserved]

(5) [Reserved]

(6) Negative credits may be banked only according to the requirements under § 90.207(c).

(b)(1) For Class I engine families initially produced during the period beginning with the 1999 model year and prior to August 1, 2003, a manufacturer may bank early credits for engines with HC + NO_x FELs below 16.1 g/kW-hr. All early credits for such Class I engines shall be calculated against a HC + NO_x level of 20.5 g/kW-hr and may continue to be calculated against the 20.5 g/kW-hr level until August 1, 2007.

(2) Beginning with the 1999 model year and prior to the applicable date listed in paragraph (a) of this section for Class II engines, a manufacturer may bank early credits for all Class II engines with HC+NO_x FELs below 12.1 g/kW-hr. All early credits for Class II engines shall be calculated against a HC+NO_x level of 18.0 g/kW-hr.

(3) [Reserved]

(4) [Reserved]

(5) [Reserved]

(6) Engines certified under the early banking provisions of this paragraph are subject to all of the requirements of this part applicable to Phase 2 engines.

(c) A manufacturer may bank actual credits only after the end of the model year and after EPA has reviewed the manufacturer's end-of-year reports. During the model year and before submittal of the end-of-year report, credits originally designated in the certification process for banking will be considered reserved and may be redesignated for trading or averaging in the end-of-year report and final report.

(d) Credits declared for banking from the previous model year that have not been reviewed by EPA may be used in averaging or trading transactions. However, such credits may be revoked at a later time following EPA review of the end-of-year report or any subsequent audit actions.

§ 90.206 Trading.

(a) An engine manufacturer may exchange emission credits with other engine manufacturers in trading.

(b) Credits for trading can be obtained from credits banked in previous model years or credits generated during the model year of the trading transaction.

(c) Traded credits can be used for averaging, banking, or further trading transactions.

(d) Traded credits are subject to the limitations on use for past model years, as set forth in § 90.204(c).

(e) In the event of a negative credit balance resulting from a transaction, both the buyer and the seller are liable, except in cases involving fraud. Certificates of all engine families participating in a negative trade may be voided *ab initio* pursuant to § 90.123.

§ 90.207 Credit calculation and manufacturer compliance with emission standards.

(a) For each engine family, HC+NO_x [NMHC+NO_x] certification emission credits (positive or negative) are to be calculated according to the following equation and rounded to the nearest gram. Consistent units are to be used throughout the equation.

$$\text{Credits} = \text{Production} \times (\text{Standard} - \text{FEL}) \times \text{Power} \times \text{Useful life} \times \text{Load Factor}$$

Where:

Production = eligible production as defined in this part. Annual production projections are used to project credit availability for initial certification. Eligible production volume is used in determining actual credits for end-of-year compliance determination.

Standard = the current and applicable Small SI engine HC+NO_x (NMHC+NO_x) emission standard in grams per kilowatt hour as determined in § 90.103 or, for early credits, the applicable emission level as specified in § 90.205(b).

FEL = the family emission limit for the engine family in grams per kilowatt hour.

Power = the maximum modal power of the certification test engine, in kilowatts, as calculated from the applicable federal test procedure as described in this part.

Useful Life = the useful life in hours corresponding to the useful life category for which the engine family was certified.

Load Factor = 47 percent (i.e., 0.47) for Test Cycle A and Test Cycle B. For approved alternate test procedures, the load factor must be calculated according to the following formula:

$$\sum_{i=1}^n (\% \text{MTT mode}_i) \times (\% \text{MTS mode}_i) \times (\text{WF mode}_i) S$$

Where:

%MTT mode_i = percent of the maximum FTP torque for mode i.

%MTS mode_i = percent of the maximum FTP engine rotational speed for mode i.

WF mode_i = the weighting factor for mode i.

(b) Manufacturer compliance with the emission standards is determined on a corporate average basis at the end of each model year. A manufacturer is in compliance when the sum of positive and negative emission credits it holds is greater than or equal to zero, except that the sum of positive and negative credits may be less than zero as allowed under paragraph (c) of this section.

(c) If, as a result of production line testing as required in subpart H of this part, an engine family is determined to be in noncompliance pursuant to § 90.710, the manufacturer may raise its FEL for past and future production as necessary. Further, a manufacturer may carry a negative credit balance (known also as a credit deficit) for the subject class and model year and for the next three model years. The credit deficit may be no larger than that created by the nonconforming family. If the credit deficit still exists after the model year following the model year in which the nonconformity occurred, the manufacturer must obtain and apply credits to offset the remaining credit deficit at a rate of 1.2 grams for each gram of deficit within the next two model years. The provisions of this paragraph are subject to the limitations in paragraph (d) of this section.

(d) Regulations elsewhere in this part notwithstanding, if an engine manufacturer experiences two or more production line testing failures pursuant to the regulations in subpart H of this part in a given model year, the manufacturer may raise the FEL of previously produced engines only to the extent that such engines represent no more than 10 percent of the manufacturer's total eligible production for that model year, as determined on the date when the FEL is adjusted. For any additional engine families determined to be in noncompliance, the manufacturer must conduct offsetting projects approved in advance by the Administrator.

(e) If, as a result of production line testing under this subpart, a manufacturer desires to lower its FEL it may do so subject to § 90.708(c).

(f) Except as allowed at paragraph (c) of this section, when a manufacturer is not in compliance with the applicable emission standard by the date 270 days after the end of the model year,

considering all credit calculations and transactions completed by then, the manufacturer will be in violation of the regulations in this part and EPA may, pursuant to § 90.123, void *ab initio* the certificates of engine families for which the manufacturer has not obtained sufficient positive emission credits.

§ 90.208 Certification.

(a) In the application for certification a manufacturer must:

(1) Submit a statement that the engines for which certification is requested will not, to the best of the manufacturer's belief, cause the manufacturer to be in noncompliance under § 90.207(b) when all credits are calculated for the manufacturer's engine families.

(2) Declare an FEL for each engine family for HC+NO_x (NMHC+NO_x). The FEL must have the same number of significant digits as the emission standard.

(3) Indicate the projected number of credits generated/needed for this family; the projected applicable eligible annual production volume, and the values required to calculate credits as given in § 90.207.

(4) Submit calculations in accordance with § 90.207 of projected emission credits (positive or negative) based on annual production projections for each family.

(5) (i) If the engine family is projected to have negative emission credits, state specifically the source (manufacturer/engine family or reserved) of the credits necessary to offset the credit deficit according to projected annual production.

(ii) If the engine family is projected to generate credits, state specifically (manufacturer/engine family or reserved) where the projected annual credits will be applied.

(iii) The manufacturer may supply the information required by this section in the form of a spreadsheet detailing the manufacturer's annual production plans and the credits generated or consumed by each engine family.

(b) All certificates issued are conditional upon manufacturer compliance with the provisions of this subpart both during and after the model year of production.

(c) Failure to comply with all provisions of this subpart will be considered to be a failure to satisfy the conditions upon which the certificate was issued, and the certificate may be determined to be void *ab initio* pursuant to § 90.123.

(d) The manufacturer bears the burden of establishing to the satisfaction of the Administrator that the conditions

upon which the certificate was issued were satisfied or waived.

(e) Projected credits based on information supplied in the certification application may be used to obtain a certificate of conformity. However, any such credits may be revoked based on review of end-of-year reports, follow-up audits, and any other verification steps considered appropriate by the Administrator.

§ 90.209 Maintenance of records.

(a) The manufacturer must establish, maintain, and retain the following adequately organized and indexed records for each engine family:

(1) EPA engine family identification code;

(2) Family Emission Limit (FEL) or FELs where FEL changes have been implemented during the model year;

(3) Maximum modal power for the certification test engine;

(4) Projected production volume for the model year; and

(5) Records appropriate to establish the quantities of engines that constitute eligible production as defined in § 90.3 for each FEL.

(b) Any manufacturer producing an engine family participating in trading reserved credits must maintain the following records on an annual basis for each such engine family:

(1) The engine family;

(2) The actual applicable production volume;

(3) The values required to calculate credits as given in § 90.207;

(4) The resulting type and number of credits generated/required;

(5) How and where credit surpluses are dispersed; and

(6) How and through what means credit deficits are met.

(c) The manufacturer must retain all records required to be maintained under this section for a period of eight years from the due date for the end-of-model year report. Records may be retained as hard copy or reduced to microfilm, ADP diskettes, and so forth, depending on the manufacturer's record retention procedure; provided, that in every case all information contained in the hard copy is retained.

(d) Nothing in this section limits the Administrator's discretion in requiring the manufacturer to retain additional records, or submit information not specifically required by this section, if otherwise permitted by law.

(e) Pursuant to a request made by the Administrator, the manufacturer must submit to the Administrator the information that the manufacturer is required to retain.

(f) EPA may, pursuant to § 90.123, void *ab initio* a certificate of conformity

for an engine family for which the manufacturer fails to retain the records required in this section or to provide such information to the Administrator upon request.

§ 90.210 End-of-year and final reports.

(a) End-of-year and final reports must indicate the engine family, the engine class, the actual production volume, the values required to calculate credits as given in § 90.207, and the number of credits generated/required.

Manufacturers must also submit how and where credit surpluses were dispersed (or are to be banked) and/or how and through what means credit deficits were met. Copies of contracts related to credit trading must be included or supplied by the broker, if applicable. The report must include a calculation of credit balances to show that the credit summation for all engines is equal to or greater than zero (or less than zero in cases of negative credit balances as permitted in § 90.207(c)). For model year 2005 and later, the report must include a calculation of the production weighted average HC+NO_x (including NMHC+NO_x) FEL for Class II engine families to show compliance with the provisions of § 90.203(g)(2).

(b) The calculation of eligible production for end-of-year and final reports must be based on engines produced for the United States market, excluding engines which are subject to state emission standards pursuant to a waiver granted by EPA under section 209(e) of the Act. Upon advance written request, the Administrator will consider other methods to track engines for credit calculation purposes that provide high levels of confidence that eligible production or sales are accurately counted.

(c)(1) End-of-year reports must be submitted within 90 days of the end of the model year to: Manager, Engine Compliance Programs Group (6403-J), U.S. Environmental Protection Agency, Washington, DC 20460.

(2) Unless otherwise approved by the Administrator, final reports must be submitted within 270 days of the end of the model year to: Manager, Engine Compliance Programs Group (6403-J), U.S. Environmental Protection Agency, Washington, DC 20460.

(d) Failure by a manufacturer to submit any end-of-year or final reports in the specified time for any engines subject to regulation under this part is a violation of § 90.1003(a)(2) and section 213(d) of the Clean Air Act for each engine.

(e) A manufacturer generating credits for banking only who fails to submit end-of-year reports in the applicable

specified time period (90 days after the end of the model year) may not use the credits until such reports are received and reviewed by EPA. Use of projected credits pending EPA review is not permitted in these circumstances.

(f) Errors discovered by EPA or the manufacturer in the end-of-year report, including errors in credit calculation, may be corrected in the final report.

(g) If EPA or the manufacturer determines that a reporting error occurred on an end-of-year or final report previously submitted to EPA under this section, the manufacturer's credits and credit calculations must be recalculated. Erroneous positive credits will be void except as provided in paragraph (h) of this section. Erroneous negative credit balances may be adjusted by EPA.

(h) If EPA review determines a reporting error in the manufacturer's favor (that is, resulting in an increased credit balance) or if the manufacturer discovers such an error within 270 days of the end of the model year, EPA shall restore the credits for use by the manufacturer.

§ 90.211 Request for hearing.

An engine manufacturer may request a hearing on the Administrator's voiding of the certificate under §§ 90.203(h), 90.206(e), 90.207(f), 90.208(c), or 90.209(f), pursuant to § 90.124. The procedures of § 90.125 shall apply to any such hearing.

Subpart D—Emission Test Equipment Provisions

18. Section 90.301 is amended by revising paragraph (a) and adding paragraph (d) to read as follows:

§ 90.301 Applicability.

(a) This subpart describes the equipment required in order to perform exhaust emission tests on new nonroad spark-ignition engines and vehicles subject to the provisions of subpart A of this part. Certain text in this subpart is identified as pertaining to Phase 1 or Phase 2 engines. Such text pertains only to engines of the specified Phase. If no indication of Phase is given, the text pertains to all engines, regardless of Phase.

* * * * *

(d) For Phase 2 Class I, and Phase 2 Class II natural gas fueled engines, the following sections from 40 CFR Part 86 are applicable to this subpart. The requirements of these sections which pertain specifically to the measurement and calculation of non-methane hydrocarbon (NMHC) exhaust emissions from otto cycle heavy-duty engines must

be followed when determining the NMHC exhaust emissions from Phase 2 Class I, and Phase 2 Class II natural gas fueled engines. Those sections are: 40 CFR 86.1306–90 Equipment required and specifications; overview, 40 CFR 86.1309–90 Exhaust gas sampling system; otto-cycle engines, 40 CFR 86.1311–94 Exhaust gas analytical system; CVS bag sampling, 40 CFR 86.1313–94(e) Fuel Specification—Natural gas-fuel, 40 CFR 86.1314–94 Analytical gases, 40 CFR 86.1316–94 Calibrations; frequency and overview, 40 CFR 86.1321–94 Hydrocarbon analyzer calibration, 40 CFR 86.1325–94 Methane analyzer calibration, 40 CFR 86.1327–94 Engine dynamometer test procedures, overview, 40 CFR 86.1340–94 Exhaust sample analysis, 40 CFR 86.1342–94 Calculations; exhaust emissions, 40 CFR 86.1344–94(d) Required information—Pre-test data, 40 CFR 86.1344–94(e) Required information—Test data.

19. Section 90.302 is revised to read as follows:

§ 90.302 Definitions.

The definitions in § 90.3 apply to this subpart. The following definitions also apply to this subpart.

Intermediate speed means the engine speed which is 85 percent of the rated speed.

Natural gas means a fuel whose primary constituent is methane.

Rated speed means the speed at which the manufacturer specifies the maximum rated power of an engine.

20. Section 90.308 is amended by revising paragraph (c) to read as follows:

§ 90.308 Lubricating oil and test fuels.

* * * * *

(c) *Test fuels—service accumulation and aging.* Unleaded gasoline representative of commercial gasoline generally available through retail outlets must be used in service accumulation and aging for gasoline-fueled spark-ignition engines. As an alternative, the certification test fuels specified under paragraph (b) of this section may be used for engine service accumulation and aging. Leaded fuel may not be used during service accumulation or aging.

21. Section 90.329 is amended by adding paragraph (c) to read as follows:

§ 90.329 Catalyst thermal stress test.

* * * * *

(c) *Phase 2 engines.* The catalyst thermal stress test is not required for engine families certified to the Phase 2 standards.

Subpart E—Gaseous Exhaust Test Procedures

22. Section 90.401 is amended by adding paragraphs (c) and (d) to read as follows:

§ 90.401 Applicability.

* * * * *

(c) Certain text in this subpart is identified as pertaining to Phase 1 or Phase 2 engines. Such text pertains only to engines of the specified Phase. If no indication of Phase is given, the text pertains to all engines, regardless of Phase.

(d) For Phase 2 Class I, and Phase 2 Class II natural gas fueled engines, the following sections from 40 CFR part 86 are applicable to this subpart. The requirements of these sections which pertain specifically to the measurement and calculation of non-methane hydrocarbon (NMHC) exhaust emissions from otto cycle heavy-duty engines must be followed when determining the NMHC exhaust emissions from Phase 2 Class I, and Phase 2 Class II natural gas fueled engines. Those sections are: 40 CFR 86.1327–94 Engine dynamometer test procedures, overview, 40 CFR 86.1340–94 Exhaust sample analysis, 40 CFR 86.1342–94 Calculations; exhaust emissions, 40 CFR 86.1344–94(d) Required information—Pre-test data, and 40 CFR 86.1344–94(e) Required information—Test data.

23. Section 90.404 is amended by adding a sentence after the first sentence of paragraph (b) to read as follows:

§ 90.404 Test procedure overview.

* * * * *

(b) * * * For Phase 2 Class I and Phase 2 Class II natural gas fueled engines the test is also designed to determine the brake-specific emissions of non-methane hydrocarbons. * * *

* * * * *

24. Section 90.409 is amended by revising paragraph (a)(3) to read as follows:

§ 90.409 Engine dynamometer test run.

(a) * * *

(3) For Phase 1 engines, at the manufacturer's option, the engine can be run with the throttle in a fixed position or by using the engine's governor (if the engine is manufactured with a governor). In either case, the engine speed and load must meet the requirements specified in paragraph (b)(12) of this section. For Phase 2 Class I and Phase 2 Class II engines equipped with an engine speed governor, the governor must be used to control engine speed during all test cycle modes except for Mode 1 or Mode 6, and no external

throttle control may be used that interferes with the function of the engine's governor; a controller may be used to adjust the governor setting for the desired engine speed in Modes 2–5 or Modes 7–10; and during Mode 1 or Mode 6 fixed throttle operation may be used to determine the 100 percent torque value.

* * * * *

25. Section 90.410 is amended by revising paragraph (b) to read as follows:

§ 90.410 Engine test cycle.

* * * * *

(b) For Phase 1 engines and Phase 2 Class I and II engines not equipped with an engine speed governor, during each non-idle mode, hold both the specified speed and load within ± five percent of point. During the idle mode, hold speed within ± ten percent of the manufacturer's specified idle engine speed. For Phase 2 Class I and II engines equipped with an engine speed governor, during Mode 1 or Mode 6 hold both the specified speed and load within ± five percent of point, during Modes 2–3, or Modes 7–8 hold the specified load with ± five percent of point, during Modes 4–5 or Modes 9–10, hold the specified load within the larger range provided by +/– 0.27Nm (+/– 0.2 lb-ft), or +/– ten (10) percent of point, and during the idle mode hold the specified speed within ± ten percent of the manufacturer's specified idle engine speed (see Table 1 in Appendix A to subpart E of this part for a description of test Modes). The use of alternative test procedures is allowed if approved in advance by the Administrator.

* * * * *

26. Section 90.427 is amended by revising paragraph (a) to read as follows:

§ 90.427 Catalyst thermal stress resistance evaluation.

(a) The purpose of the evaluation procedure specified in this section is to determine the effect of thermal stress on catalyst conversion efficiency for Phase 1 engines. The thermal stress is imposed on the test catalyst by exposing it to quiescent heated air in an oven. The evaluation of the effect of such stress on catalyst performance is based on the resultant degradation of the efficiency with which the conversions of specific pollutants are promoted. The application of this evaluation procedure involves the several steps that are described in the following paragraphs.

* * * * *

Subpart F—Selective Enforcement Auditing

27. Section 90.503 is amended by revising paragraphs (f)(3) and (f)(4) to read as follows:

§ 90.503 Test orders.

* * * * *

(f) * * *

(3) Any SEA test order for which the family or configuration, as appropriate, fails under § 90.510 or for which testing is not completed will not be counted against the annual limit.

(4) When the annual limit has been met, the Administrator may issue additional test orders to test those families or configurations for which evidence exists indicating nonconformity, or for which the Administrator has reason to believe are not being appropriately represented or tested in Production Line Testing conducted under subpart H of this part, if applicable. An SEA test order issued pursuant to this provision will include a statement as to the reason for its issuance.

28. Section 90.509 is amended by revising paragraph (b) to read as follows:

§ 90.509 Calculation and reporting of test results.

* * * * *

(b)(1) Final test results are calculated by summing the initial test results derived in paragraph (a) of this section for each test engine, dividing by the number of tests conducted on the engine, and rounding to the same number of decimal places contained in the applicable standard. For Phase 2 engines only, this result shall be expressed to one additional significant figure.

(2) Final deteriorated test results (for Phase 2 test engines only) are calculated by applying the appropriate deterioration factors, from the certification process for the engine family, to the final test results, and rounding to the same number of decimal places contained in the applicable standard.

* * * * *

29. Section 90.510 is amended by revising paragraph (b) to read as follows:

§ 90.510 Compliance with acceptable quality level and passing and failing criteria for selective enforcement audits.

* * * * *

(b) For Phase I engines, a failed engine is an engine whose final test results pursuant to § 90.509(b), for one or more of the applicable pollutants exceed the emission standard. For Phase 2 engines, a failed engine is an engine whose final deteriorated test results pursuant to

§ 90.509(b), for one or more of the applicable pollutants exceed the emission standard (FEL, if applicable).

* * * * *

30. Section 90.512 is amended by revising paragraph (b) to read as follows:

§ 90.512 Request for public hearing.

* * * * *

(b) The manufacturer's request shall be filed with the Administrator not later than 15 days after the Administrator's notification of his or her decision to suspend, revoke or void, unless otherwise specified by the Administrator. The manufacturer shall simultaneously serve two copies of this request upon the Director of the Engine Programs and Compliance Division and file two copies with the Hearing Clerk of the Agency. Failure of the manufacturer to request a hearing within the time provided constitutes a waiver of the right to a hearing. Subsequent to the expiration of the period for requesting a hearing as of right, the Administrator may, in his or her discretion and for good cause shown, grant the manufacturer a hearing to contest the suspension, revocation or voiding.

* * * * *

Subpart G—Importation of Nonconforming Engines

31. Section 90.612 is amended by revising paragraph (g) to read as follows:

§ 90.612 Exemptions and exclusions.

* * * * *

(g) Applications for exemptions and exclusions provided for in paragraphs (b), (c), and (e) of this section are to be mailed to: U.S. Environmental Protection Agency, Office of Mobile Sources, Engine Compliance Programs Group (6403-J), Washington, D.C. 20460, Attention: Imports.

32. Subpart H, which was previously "reserved", is added to part 90 to read as follows:

Subpart H—Manufacturer Production Line Testing Program

Sec.

90.701 Applicability.

90.702 Definitions.

90.703 Production line testing by the manufacturer.

90.704 Maintenance of records; submission of information.

90.705 Right of entry and access.

90.706 Engine sample selection.

90.707 Test procedures.

90.708 Cumulative Sum (CumSum) Procedure.

90.709 Calculation and reporting of test results.

90.710 Compliance with criteria for production line testing.

90.711 Suspension and revocation of certificates of conformity.

90.712 Request for public hearing.

90.713 Administrative procedures for public hearing.

Subpart H—Manufacturer Production Line Testing Program

§ 90.701 Applicability.

(a) The requirements of this subpart are applicable to all Phase 2 nonroad nonhandheld engines families subject to the provisions of subpart A of this part unless otherwise exempted in this subpart.

(b) The procedures described in this subpart are optional for small volume engine manufacturers and small volume engine families as defined in this part. Small volume engine manufacturers and small volume engine families for which the manufacturer opts not to conduct testing under this subpart pursuant to this paragraph shall remain subject to the Selective Enforcement Auditing procedures of subpart F of this part.

(c) Engine families for which the manufacturer opts to conduct in-use testing pursuant to subpart M of this part are exempt from this subpart, but shall remain subject to the Selective Enforcement Auditing procedures of subpart F of this part.

§ 90.702 Definitions.

The definitions in subpart A of this part apply to this subpart. The following definitions also apply to this subpart.

Configuration means any subclassification of an engine family which can be described on the basis of gross power, emission control system, governed speed, injector size, engine calibration, and other parameters as designated by the Administrator.

Test sample means the collection of engines selected from the population of an engine family for emission testing.

§ 90.703 Production line testing by the manufacturer.

(a) Manufacturers of small SI engines shall test production line engines from each engine family according to the provisions of this subpart.

(b) Production line engines must be tested using the test procedure specified in subpart E of this part except that the Administrator may approve minor variations that the Administrator deems necessary to facilitate efficient and economical testing where the manufacturer demonstrates to the satisfaction of the Administrator that such variations will not significantly impact the test results. Any adjustable engine parameter must be set to values or positions that are within the range recommended to the ultimate purchaser,

unless otherwise specified by the Administrator. The Administrator may specify values within or without the range recommended to the ultimate purchaser.

§ 90.704 Maintenance of records; submission of information.

(a) The manufacturer of any new small SI engine subject to any of the provisions of this subpart must establish, maintain, and retain the following adequately organized and indexed records:

(1) *General records.* A description of all equipment used to test engines in accordance with § 90.703. Subpart D of this part sets forth relevant equipment requirements in §§ 90.304, 90.305, 90.306, 90.307, 90.308, 90.309, 90.310 and 90.313.

(2) *Individual records.* These records pertain to each production line test conducted pursuant to this subpart and include:

(i) The date, time, and location of each test;

(ii) The number of hours of service accumulated on the test engine when the test began and ended;

(iii) The names of all supervisory personnel involved in the conduct of the production line test;

(iv) A record and description of any adjustment, repair, preparation or modification performed prior to and/or subsequent to approval by the Administrator pursuant to § 90.707(b)(1), giving the date, associated time, justification, name(s) of the authorizing personnel, and names of all supervisory personnel responsible for the conduct of the repair;

(v) If applicable, the date the engine was shipped from the assembly plant, associated storage facility or port facility, and the date the engine was received at the testing facility;

(vi) A complete record of all emission tests performed pursuant to this subpart (except tests performed directly by EPA), including all individual worksheets and/or other documentation relating to each test, or exact copies thereof, in accordance with the record requirements specified in §§ 90.405 and 90.406; and

(vii) A brief description of any significant events during testing not otherwise described under paragraph (a)(2) of this section, commencing with the test engine selection process and including such extraordinary events as engine damage during shipment.

(3) The manufacturer must establish, maintain and retain general records, pursuant to paragraph (a)(1) of this section, for each test cell that can be

used to perform emission testing under this subpart.

(b) The manufacturer must retain all records required to be maintained under this subpart for a period of one year after completion of all testing required for the engine family in a model year. Records may be retained as hard copy (i.e., on paper) or reduced to microfilm, floppy disk, or some other method of data storage, depending upon the manufacturer's record retention procedure; provided, that in every case, all the information contained in the hard copy is retained.

(c) The manufacturer must, upon request by the Administrator, submit the following information with regard to engine production:

(1) Projected production or actual production for each engine configuration within each engine family for which certification has been requested and/or approved;

(2) Number of engines, by configuration and assembly plant, scheduled for production or actually produced.

(d) Nothing in this section limits the Administrator's discretion to require a manufacturer to establish, maintain, retain or submit to EPA information not specified by this section and otherwise permitted by law.

(e) All reports, submissions, notifications, and requests for approval made under this subpart must be addressed to: Manager, Engine Compliance Programs Group (6403J), U.S. Environmental Protection Agency, Washington, DC 20460.

(f) The manufacturer must electronically submit the results of its production line testing using EPA's standardized format. The Administrator may exempt manufacturers from this requirement upon written request with supporting justification.

§ 90.705 Right of entry and access.

(a) To allow the Administrator to determine whether a manufacturer is complying with the provisions of this subpart or other subparts of this part, one or more EPA enforcement officers may enter during operating hours and upon presentation of credentials any of the following places:

(1) Any facility, including ports of entry, where any engine to be introduced into commerce or any emission-related component is manufactured, assembled, or stored;

(2) Any facility where any test conducted pursuant to this or any other subpart or any procedure or activity connected with such test is or was performed;

(3) Any facility where any test engine is present; and

(4) Any facility where any record required under § 90.704 or other document relating to this subpart or any other subpart of this part is located.

(b) Upon admission to any facility referred to in paragraph (a) of this section, EPA enforcement officers are authorized to perform the following inspection-related activities:

(1) To inspect and monitor any aspect of engine manufacture, assembly, storage, testing and other procedures, and to inspect and monitor the facilities in which these procedures are conducted;

(2) To inspect and monitor any aspect of engine test procedures or activities, including test engine selection, preparation and service accumulation, emission test cycles, and maintenance and verification of test equipment calibration;

(3) To inspect and make copies of any records or documents related to the assembly, storage, selection, and testing of an engine; and

(4) To inspect and photograph any part or aspect of any engine and any component used in the assembly thereof that is reasonably related to the purpose of the entry.

(c) EPA enforcement officers are authorized to obtain reasonable assistance without cost from those in charge of a facility to help the officers perform any function listed in this subpart and they are authorized to request the manufacturer to make arrangements with those in charge of a facility operated for the manufacturer's benefit to furnish reasonable assistance without cost to EPA.

(1) Reasonable assistance includes, but is not limited to, clerical, copying, interpretation and translation services; the making available on an EPA enforcement officer's request of personnel of the facility being inspected during their working hours to inform the EPA enforcement officer of how the facility operates and to answer the officer's questions; and the performance on request of emission tests on any engine which is being, has been, or will be used for production line or other testing.

(2) By written request, signed by the Assistant Administrator for Air and Radiation, and served on the manufacturer, a manufacturer may be compelled to cause the personal appearance of any employee at such a facility before an EPA enforcement officer. Any such employee who has been instructed by the manufacturer to appear will be entitled to be

accompanied, represented, and advised by counsel.

(d) EPA enforcement officers are authorized to seek a warrant or court order authorizing the EPA enforcement officers to conduct the activities authorized in this section, as appropriate, to execute the functions specified in this section. EPA enforcement officers may proceed *ex parte* to obtain a warrant or court order whether or not the EPA enforcement officers first attempted to seek permission from the manufacturer or the party in charge of the facility(ies) in question to conduct the activities authorized in this section.

(e) A manufacturer must permit an EPA enforcement officer(s) who presents a warrant or court order to conduct the activities authorized in this section as described in the warrant or court order. The manufacturer must also cause those in charge of its facility or a facility operated for its benefit to permit entry and access as authorized in this section pursuant to a warrant or court order whether or not the manufacturer controls the facility. In the absence of a warrant or court order, an EPA enforcement officer(s) may conduct the activities authorized in this section only upon the consent of the manufacturer or the party in charge of the facility(ies) in question.

(f) It is not a violation of this part or the Clean Air Act for any person to refuse to permit an EPA enforcement officer(s) to conduct the activities authorized in this section if the officer(s) appears without a warrant or court order.

(g) A manufacturer is responsible for locating its foreign testing and manufacturing facilities in jurisdictions where local law does not prohibit an EPA enforcement officer(s) from conducting the entry and access activities specified in this section. EPA will not attempt to make any inspections which it has been informed local foreign law prohibits.

§ 90.706 Engine sample selection.

(a) At the start of each model year, the small SI engine manufacturer will begin to randomly select engines from each engine family for production line testing at a rate of one percent of the projected production of that family. Each engine will be selected from the end of the assembly line.

(1) *For newly certified engine families:* After two engines are tested, the manufacturer will calculate the required sample size for the model year for each pollutant (HC+NO_x(NMHC+NO_x) and CO) according to the Sample Size

Equation in paragraph (b) of this section.

(2) *For carry-over engine families:* After one engine is tested, the manufacturer will combine the test with the last test result from the previous model year and then calculate the required sample size for the model year for each pollutant according to the Sample Size Equation in paragraph (b) of this section.

(b)(1) Manufacturers will calculate the required sample size for the model year for each pollutant for each engine family using the Sample Size Equation in this paragraph. N is calculated for each pollutant from each test result. The higher of the two values for the number N indicates the number of tests required for the model year for an engine family.

N is recalculated for each pollutant after each test. Test results used to calculate the variables in the following Sample Size Equation must be final deteriorated test results as specified in § 90.709(c).

$$N = \left[\frac{(t_{95} * \sigma)^2}{(x - FEL)} \right] + 1$$

Where:

N = required sample size for the model year.

t₉₅ = 95% confidence coefficient. It is dependent on the actual number of tests completed, n, as specified in the table in paragraph (b)(2) of this section. It defines one-tail, 95% confidence intervals.

σ = actual test sample standard deviation calculated from the following equation:

$$\sigma = \sqrt{\frac{\sum (X_i - x)^2}{n - 1}}$$

x_i = emission test result for an individual engine.

x = mean of emission test results of the actual sample.

FEL = Family Emission Limit or standard if no FEL.

n = The actual number of tests completed in an engine family.

(2) The following table specifies the Actual Number of Tests (n) & 1-tail Confidence Coefficients (t₉₅):

n	t ₉₅	n	t ₉₅	n	t ₉₅
2	6.31	12	1.80	22	1.72
3	2.92	13	1.78	23	1.72
4	2.35	14	1.77	24	1.71
5	2.13	15	1.76	25	1.71
6	2.02	16	1.75	26	1.71
7	1.94	17	1.75	27	1.71
8	1.90	18	1.74	28	1.70
9	1.86	19	1.73	29	1.70
10	1.83	20	1.73	30	1.70
11	1.81	21	1.72	∞	1.645

(3) A manufacturer must distribute the testing of the remaining number of engines needed to meet the required sample size N, evenly throughout the remainder of the model year.

(4) After each new test, the required sample size, N, is recalculated using updated sample means, sample standard deviations and the appropriate 95% confidence coefficient.

(5) A manufacturer must continue testing and updating each engine family's sample size calculations according to paragraphs (b)(1) through (b)(4) of this section until a decision is made to stop testing as described in paragraph (b)(6) of this section or a noncompliance decision is made pursuant to § 90.710(b).

(6) If, at any time throughout the model year, the calculated required sample size, N, for an engine family is less than or equal to the actual sample size, n, and the sample mean, x, for HC + NO_x (NMHC+NO_x) and CO is less than or equal to the FEL or standard if no FEL, the manufacturer may stop testing that engine family.

(7) If, at any time throughout the model year, the sample mean, x, for HC + NO_x (NMHC+NO_x) or CO is greater than the FEL or standard if no FEL, the manufacturer must continue testing that

engine family at the appropriate maximum sampling rate.

(8) The maximum required sample size for an engine family (regardless of the required sample size, N, as calculated in paragraph (b)(1) of this section) is the lesser of thirty tests per model year or one percent of projected annual production for that engine family for that model year.

(9) Manufacturers may elect to test additional engines. Additional engines, whether tested in accordance with the testing procedures specified in § 90.707 or not, may not be included in the Sample Size and Cumulative Sum equation calculations as defined in paragraph (b)(1) of this section and § 90.708(a), respectively. However, such additional test results may be used as appropriate to "bracket" or define the boundaries of the production duration of any emission nonconformity determined under this subpart. Such additional test data must be identified and provided to EPA with the submittal of the official CumSum results.

(c) The manufacturer must produce and assemble the test engines using its normal production and assembly process for engines to be distributed into commerce.

(d) No quality control, testing, or assembly procedures shall be used on

any test engine or any portion thereof, including parts and subassemblies, that have not been or will not be used during the production and assembly of all other engines of that family, unless the Administrator approves the modification in production or assembly procedures in advance.

§ 90.707 Test procedures.

(a)(1) For small SI engines subject to the provisions of this subpart, the prescribed test procedures are specified in subpart E of this part.

(2) The Administrator may, on the basis of a written application by a manufacturer, prescribe test procedures other than those specified in paragraph (a)(1) of this section for any small SI engine the Administrator determines is not susceptible to satisfactory testing using procedures specified in paragraph (a)(1) of this section.

(b)(1) The manufacturer may not adjust, repair, prepare, or modify any test engine and may not perform any emission test on any test engine unless this adjustment, repair, preparation, modification and/or test is documented in the manufacturer's engine assembly and inspection procedures and is actually performed by the manufacturer on every production line engine or unless this adjustment, repair,

preparation, modification and/or test is required or permitted under this subpart or is approved in advance by the Administrator.

(2) The Administrator may adjust or cause to be adjusted any engine parameter which the Administrator has determined to be subject to adjustment for certification, Production Line Testing and Selective Enforcement Audit testing, to any setting within the physically adjustable range of that parameter, as determined by the Administrator, prior to the performance of any test. However, if the idle speed parameter is one which the Administrator has determined to be subject to adjustment, the Administrator may not adjust it or require that it be adjusted to any setting which causes a lower engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter if the manufacturer had accumulated 12 hours of service on the engine under paragraph (c) of this section, all other parameters being identically adjusted for the purpose of the comparison. The manufacturer may be requested to supply information necessary to establish an alternate minimum idle speed. The Administrator, in making or specifying these adjustments, may consider the effect of the deviation from the manufacturer's recommended setting on emission performance characteristics as well as the likelihood that similar settings will occur on in-use engines. In determining likelihood, the Administrator may consider factors such as, but not limited to, the effect of the adjustment on engine performance characteristics and information from similar in-use engines.

(c) *Service accumulation.* (1) Unless otherwise approved by the Administrator, prior to performing exhaust emission production line testing, the manufacturer may accumulate up to 12 hours of service on each test engine. For catalyst-equipped engines, the manufacturer must accumulate a number of hours equal to the number of hours accumulated to represent stabilized emissions on the engine used to obtain certification.

(2) Service accumulation must be performed in a manner using good engineering judgment to obtain emission results representative of production line engines.

(d) Unless otherwise approved by the Administrator, the manufacturer may not perform any maintenance on test engines after selection for testing.

(e) If an engine is shipped to a remote facility for production line testing, and an adjustment or repair is necessary

because of shipment, the engine manufacturer must perform the necessary adjustment or repair only after the initial test of the engine, except in cases where the Administrator has determined that the test would be impossible or unsafe to perform or would permanently damage the engine. Engine manufacturers must report to the Administrator, in the quarterly report required by § 90.709(e), all adjustments or repairs performed on test engines prior to each test.

(f) If an engine cannot complete the service accumulation or an emission test because of a malfunction, the manufacturer may request that the Administrator authorize either the repair of that engine or its deletion from the test sequence.

(g) *Testing.* A manufacturer must test engines with the test procedure specified in subpart E of this part to demonstrate compliance with the applicable FEL (or standard where there is no FEL). If alternate or special test procedures pursuant to regulations at § 90.120 are used in certification, then those alternate procedures must be used in production line testing.

(h) *Retesting.* (1) If an engine manufacturer reasonably determines that an emission test of an engine is invalid because of a procedural error, test equipment problem, or engine performance problem that causes the engine to be unable to safely perform a valid test, the engine may be retested. A test is not invalid simply because the emission results are high relative to other engines of the family. Emission results from all tests must be reported to EPA. The engine manufacturer must also include a detailed explanation of the reasons for invalidating any test in the quarterly report required in § 90.709(e). If a test is invalidated because of an engine performance problem, the manufacturer must document in detail the nature of the problem and the repairs performed in order to use the after-repair test results for the original test results.

(2) Routine retests may be conducted if the manufacturer conducts the same number of tests on all engines in the family. The results of these tests must be averaged according to procedures of § 90.709.

§ 90.708 Cumulative Sum (CumSum) procedure.

(a) (1) Manufacturers must construct separate CumSum Equations for each regulated pollutant (HC+NO_x (NMHC+NO_x) and CO) for each engine family. Test results used to calculate the variables in the CumSum Equations must be final deteriorated test results as

defined in § 90.709(c). The CumSum Equation is constructed as follows:

$$C_i = \max[0, OR(C_{i-1} + X_i - (FEL + F))]$$

Where:

C_i = The current CumSum statistic.

C_{i-1} = The previous CumSum statistic.
Prior to any testing, the CumSum statistic = 0 (i.e. $C_0 = 0$).

X_i = The current emission test result for an individual engine.

FEL = Family Emission Limit (the standard if no FEL).

$F = .25 \times \sigma$.

(2) After each test pursuant to paragraph (a)(1) of this section, C_i is compared to the action limit, H, the quantity which the CumSum statistic must exceed, in two consecutive tests, before the engine family may be determined to be in noncompliance for a regulated pollutant for purposes of § 90.710.

Where:

H = The Action Limit. It is $5.0 \times \sigma$, and is a function of the standard deviation, σ .

σ = is the sample standard deviation and is recalculated after each test.

(b) After each engine is tested, the CumSum statistic shall be promptly updated according to the CumSum Equation in paragraph (a) of this section.

(c)(1) If, at any time during the model year, a manufacturer amends the application for certification for an engine family as specified in § 90.122(a) by performing an engine family modification (i.e. a change such as a running change involving a physical modification to an engine, a change in specification or setting, the addition of a new configuration, or the use of a different deterioration factor) with no changes to the FEL (where applicable), all previous sample size and CumSum statistic calculations for the model year will remain unchanged.

(2) If, at any time during the model year, a manufacturer amends the application for certification for an engine family as specified in § 90.122 (a) by modifying its FEL (where applicable) for future production, as a result of an engine family modification, the manufacturer must continue its calculations by inserting the new FEL into the sample size equation as specified in § 90.706(b)(1) and into the CumSum equation in paragraph (a) of this section. All previous calculations remain unchanged. If the sample size calculation indicates that additional tests are required, then those tests must be performed. CumSum statistic calculations must not indicate that the family has exceeded the action limit for two consecutive tests. Where applicable,

the manufacturer's final credit report as required by § 90.210 must break out the credits that result from each FEL and corresponding CumSum analysis for the set of engines built to each FEL.

(3) If, at any time during the model year, a manufacturer amends the application for certification for an engine family as specified in § 90.122 (a) (or for an affected part of the year's production in cases where there were one or more mid-year engine family modifications), by modifying its FEL (where applicable) for past and/or future production, without performing an engine modification, all previous sample size and CumSum statistic calculations for the model year must be recalculated using the new FEL. If the sample size calculation indicates that additional tests are required, then those tests must be performed. The CumSum statistic recalculation must not indicate that the family has exceeded the action limit for two consecutive tests. Where applicable, the manufacturer's final credit report as required by § 90.210 must break out the credits that result from each FEL and corresponding CumSum analysis for the set of engines built to each FEL.

§ 90.709 Calculation and reporting of test results.

(a) Initial test results are calculated following the applicable test procedure specified in § 90.707 (a). The manufacturer rounds these results to the number of decimal places contained in the applicable emission standard expressed to one additional significant figure.

(b) Final test results are calculated by summing the initial test results derived in paragraph (a) of this section for each test engine, dividing by the number of tests conducted on the engine, and rounding to the same number of decimal places contained in the applicable standard expressed to one additional significant figure.

(c) The final deteriorated test results for each test engine are calculated by applying the appropriate deterioration factors, derived in the certification process for the engine to the final test results, and rounding to the same number of decimal places contained in the applicable standard.

(d) If, at any time during the model year, the CumSum statistic exceeds the applicable action limit, H, in two consecutive tests for any regulated pollutant, (HC+NO_x (NMHC+NO_x) or CO) the engine family may be determined to be in noncompliance and the manufacturer must notify EPA by contacting its official EPA certification representative within ten working days

of such exceedance by the CumSum statistic.

(e) Within 45 calendar days of the end of each quarter, each engine manufacturer must submit to the Administrator a report which includes the following information:

(1) The location and description of the manufacturer's or other's exhaust emission test facilities which were utilized to conduct testing reported pursuant to this section;

(2) Total production and sample sizes, N and n, for each engine family;

(3) The FEL (standard, if no FEL) against which each engine family was tested;

(4) A description of the process to obtain engines on a random basis;

(5) A description of the test engines;

(6) For each test conducted:

(i) A description of the test engine, including:

(A) Configuration and engine family identification;

(B) Year, make, and build date;

(C) Engine identification number; and

(D) Number of hours of service

accumulated on engine prior to testing;

(ii) Location where service accumulation was conducted and description of accumulation procedure and schedule;

(iii) Test number, date, test procedure used, initial test results before and after rounding, final test results before and after rounding and final deteriorated test results for all exhaust emission tests, whether valid or invalid, and the reason for invalidation, if applicable;

(iv) A complete description of any adjustment, modification, repair, preparation, maintenance, and/or testing which was performed on the test engine, was not reported pursuant to any other paragraph of this subpart, and will not be performed on all other production engines;

(v) A CumSum analysis, as required in § 90.708, of the production line test results for each engine family; and

(vi) Any other information the Administrator may request relevant to the determination whether the new engines being manufactured by the manufacturer do in fact conform with the regulations with respect to which the certificate of conformity was issued;

(7) For each failed engine as defined in § 90.710(a), a description of the remedy and test results for all retests as required by § 90.711(g);

(8) The date of the end of the engine manufacturer's model year production for each engine family; and

(9) The following signed statement and endorsement by an authorized representative of the manufacturer:

This report is submitted pursuant to Sections 213 and 208 of the Clean Air Act.

This production line testing program was conducted in complete conformance with all applicable regulations under 40 CFR Part 90. No emission-related changes to production processes or quality control procedures for the engine family tested have been made during this production line testing program that affect engines from the production line. All data and information reported herein is, to the best of (Company Name) knowledge, true and accurate. I am aware of the penalties associated with violations of the Clean Air Act and the regulations thereunder. (Authorized Company Representative.)

§ 90.710 Compliance with criteria for production line testing.

(a) A failed engine is one whose final deteriorated test results pursuant to § 90.709(c), for HC+NO_x (NMHC+NO_x) or CO exceeds the applicable Family Emission Limit (FEL) or standard if no FEL.

(b) An engine family shall be determined to be in noncompliance, if at any time throughout the model year, the CumSum statistic, C_i, for HC+NO_x (NMHC+NO_x) or CO, is greater than the action limit, H, for that pollutant, for two consecutive tests.

§ 90.711 Suspension and revocation of certificates of conformity.

(a) The certificate of conformity is suspended with respect to any engine failing pursuant to § 90.710(a) effective from the time that testing of that engine is completed.

(b) The Administrator may suspend the certificate of conformity for an engine family which is determined to be in noncompliance pursuant to § 90.710(b). This suspension will not occur before thirty days after the engine family is determined to be in noncompliance and the Administrator has notified the manufacturer of its intent to suspend. During this thirty day period the Administrator will work with the manufacturer to achieve appropriate production line changes to avoid the need to halt engine production, if possible. The Administrator will approve or disapprove any such production line changes proposed to address a family that has been determined to be in noncompliance under this subpart within 15 days of receipt. If the Administrator does not approve or disapprove such a proposed change within such time period, the proposed change shall be considered approved.

(c) If the results of testing pursuant to the regulations in this subpart indicate that engines of a particular family produced at one plant of a manufacturer do not conform to the regulations in this part with respect to which the certificate of conformity was issued, the Administrator may suspend the

certificate of conformity with respect to that family for engines manufactured by the manufacturer at all other plants.

(d) Notwithstanding the fact that engines described in the application for certification may be covered by a certificate of conformity, the Administrator may suspend such certificate immediately in whole or in part if the Administrator finds any one of the following infractions to be substantial:

(1) The manufacturer refuses to comply with any of the requirements of this subpart.

(2) The manufacturer submits false or incomplete information in any report or information provided to the Administrator under this subpart.

(3) The manufacturer renders inaccurate any test data submitted under this subpart.

(4) An EPA enforcement officer is denied the opportunity to conduct activities authorized in this subpart and a warrant or court order is presented to the manufacturer or the party in charge of the facility in question.

(5) An EPA enforcement officer is unable to conduct activities authorized in § 90.705 because a manufacturer has located its facility in a foreign jurisdiction where local law prohibits those activities.

(e) The Administrator shall notify the manufacturer in writing of any suspension or revocation of a certificate of conformity in whole or in part, except that the certificate is immediately suspended with respect to any failed engines as provided for in paragraph (a) of this section.

(f) The Administrator may revoke a certificate of conformity for an engine family after the certificate has been suspended pursuant to paragraph (b) or (c) of this section if the proposed remedy for the nonconformity, as reported by the manufacturer to the Administrator, is one requiring a design change or changes to the engine and/or emission control system as described in the application for certification of the affected engine family.

(g) Once a certificate has been suspended for a failed engine, as provided for in paragraph (a) of this section, the manufacturer must take the following actions before the certificate is reinstated for that failed engine:

(1) Remedy the nonconformity;

(2) Demonstrate that the engine conforms to the applicable standards (FELs, where applicable) by retesting the engine in accordance with these regulations; and

(3) Submit a written report to the Administrator, described in § 90.709(e)(7), after successful

completion of testing on the failed engine, which contains a description of the remedy and test results for each engine in addition to other information that may be required by this part.

(h) Once a certificate for a failed engine family has been suspended pursuant to paragraph (b) or (c) of this section, the manufacturer must take the following actions before the Administrator will consider reinstating the certificate:

(1) Submit a written report to the Administrator which identifies the reason for the noncompliance of the engines, describes the proposed remedy, including a description of any proposed quality control and/or quality assurance measures to be taken by the manufacturer to prevent future occurrences of the problem, and states the date on which the remedies will be implemented; and

(2) Demonstrate that the engine family for which the certificate of conformity has been suspended does in fact comply with the regulations of this part by testing as many engines as needed so that the CumSum statistic, as calculated in § 90.708(a), falls below the action limit. Such testing must comply with the provisions of this part. If the manufacturer elects to continue testing individual engines after suspension of a certificate, the certificate is reinstated for any engine actually determined to be in conformance with the Family Emission Limits (or standards if no FEL) through testing in accordance with the applicable test procedures, provided that the Administrator has not revoked the certificate pursuant to paragraph (f) of this section.

(i) Once the certificate has been revoked for an engine family, if the manufacturer desires to continue introduction into commerce of a modified version of that family, the following actions must be taken before the Administrator may issue a certificate for that modified family:

(1) If the Administrator determines that the proposed change(s) in engine design may have an effect on emission performance deterioration, the Administrator shall notify the manufacturer within five working days after receipt of the report in paragraph (h)(1) of this section whether subsequent testing under this subpart will be sufficient to evaluate the proposed change or changes or whether additional testing will be required;

(2) After implementing the change or changes intended to remedy the nonconformity, the manufacturer must demonstrate that the modified engine family does in fact conform with the regulations of this part by testing as

many engines as needed from the modified engine family so that the CumSum statistic, as calculated in § 90.708(a) using the newly assigned FEL if applicable, falls below the action limit; and

(3) When the requirements of paragraphs (i)(1) and (i)(2) of this section are met, the Administrator shall reissue the certificate or issue a new certificate, as the case may be, to include that family. As long as the CumSum statistic remains above the action limit, the revocation remains in effect.

(j) At any time subsequent to a suspension of a certificate of conformity for a test engine pursuant to paragraph (a) of this section, but not later than 15 days (or such other period as may be allowed by the Administrator) after notification of the Administrator's decision to suspend or revoke a certificate of conformity in whole or in part pursuant to paragraph (b), (c), or (f) of this section, a manufacturer may request a hearing as to whether the tests have been properly conducted or any sampling methods have been properly applied.

(k) Any suspension of a certificate of conformity under paragraph (d) of this section shall:

(1) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with §§ 90.712 and 90.713; and

(2) Not apply to engines no longer in the possession of the manufacturer.

(l) After the Administrator suspends or revokes a certificate of conformity pursuant to this section and prior to the commencement of a hearing under § 90.712, if the manufacturer demonstrates to the Administrator's satisfaction that the decision to suspend or revoke the certificate was based on erroneous information, the Administrator shall reinstate the certificate.

(m) To permit a manufacturer to avoid storing non-test engines while conducting subsequent testing of the noncomplying family, a manufacturer may request that the Administrator conditionally reinstate the certificate for that family. The Administrator may reinstate the certificate subject to the following condition: the manufacturer must commit to performing offsetting measures that remedy the nonconformity at no expense to the owners, and which are approved in advance by the Administrator for all engines of that family produced from the time the certificate is conditionally reinstated if the CumSum statistic does not fall below the action limit.

§ 90.712 Request for public hearing.

(a) If the manufacturer disagrees with the Administrator's decision to suspend or revoke a certificate or disputes the basis for an automatic suspension pursuant to § 90.711(a), the manufacturer may request a public hearing.

(b) The manufacturer's request shall be filed with the Administrator not later than 15 days after the Administrator's notification of his or her decision to suspend or revoke, unless otherwise specified by the Administrator. The manufacturer shall simultaneously serve two copies of this request upon the Manager of the Engine Compliance Programs Group and file two copies with the Hearing Clerk for the Agency. Failure of the manufacturer to request a hearing within the time provided constitutes a waiver of the right to a hearing. Subsequent to the expiration of the period for requesting a hearing as of right, the Administrator may, in his or her discretion and for good cause shown, grant the manufacturer a hearing to contest the suspension or revocation.

(c) A manufacturer shall include in the request for a public hearing:

(1) A statement as to which engine configuration(s) within a family is to be the subject of the hearing; and

(2) A concise statement of the issues to be raised by the manufacturer at the hearing, except that in the case of the hearing requested under § 90.711(j), the hearing is restricted to the following issues:

(i) Whether tests have been properly conducted (specifically, whether the tests were conducted in accordance with applicable regulations under this part and whether test equipment was properly calibrated and functioning);

(ii) Whether sampling plans and statistical analyses have been properly applied (specifically, whether sampling procedures and statistical analyses specified in this subpart were followed and whether there exists a basis for distinguishing engines produced at plants other than the one from which engines were selected for testing which would invalidate the Administrator's decision under § 90.711(c));

(3) A statement specifying reasons why the manufacturer believes it will prevail on the merits of each of the issues raised; and

(4) A summary of the evidence which supports the manufacturer's position on each of the issues raised.

(d) A copy of all requests for public hearings will be kept on file in the Office of the Hearing Clerk and will be made available to the public during Agency business hours.

§ 90.713 Administrative procedures for public hearing.

The administrative procedures for a public hearing requested under this subpart shall be those procedures set forth in the regulations found at §§ 90.513 through 90.516. References in § 90.513 to § 90.511(j), § 90.512(c)(2), § 90.511(e), § 90.512, § 90.511(d), § 90.503, § 90.512(c) and § 90.512(b) shall be deemed to mean § 90.711(j), § 90.712(c)(2), § 90.711(e), § 90.712, § 90.711(d), § 90.703, and § 90.712(c) and § 90.712(b), respectively. References to "test orders" in § 90.513 are not applicable.

33. Subpart I is amended by revising the subpart heading to read as follows:

Subpart I—Emission-related Defect Reporting Requirements, Voluntary Emission Recall Program, Ordered Recalls

34. Section 90.801 is amended by designating the existing text as paragraph (a) and adding paragraphs (b), (c), (d), (e), (f) and (g) to read as follows:

§ 90.801 Applicability.

* * * * *

(b) Phase 2 engines subject to provisions of subpart B of this part are subject to recall regulations specified in 40 CFR part 85, subpart S, except as otherwise provided in this section.

(c) Reference to section 214 of the Clean Air Act in 40 CFR 85.1801(a) is deemed to mean section 216 of the Clean Air Act.

(d) Reference to section 202 of the Act in 40 CFR 85.1802(a) is deemed to mean section 213 of the Act.

(e) Reference to "family particulate emission limits" as defined in part 86 promulgated under section 202 of the Act" in 40 CFR 85.1803(a) and 85.1805(a)(1) is deemed to mean "family emission limits" as defined in subpart C of this part 90 promulgated under section 213 of the Act".

(f) Reference to "vehicles or engines" throughout 40 CFR part 85, subpart S is deemed to mean "Phase 2 nonroad small SI engines at or below 19 kW."

(g) In addition to the requirements in 40 CFR 85.1805(a)(9) for Phase 2 engines include a telephone number provided by the manufacturer, which may be used to report difficulty in obtaining recall repairs.

35. Section 90.802 is amended by adding a sentence at the end of the introductory text to read as follows:

§ 90.802 Definitions.

* * * The definitions of 40 CFR 85.1801 also apply to this part.

* * * * *

36. Section 90.803 is amended by revising paragraph (c) to read as follows:

§ 90.803 Emission defect information report.

* * * * *

(c) The manufacturer must submit defect information reports to EPA's Engine Compliance Programs Group not more than 15 working days after an emission-related defect is found to affect 25 or more engines manufactured in the same certificate or model year. Information required by paragraph (d) of this section that is either not available within 15 working days or is significantly revised must be submitted to EPA's Engine Compliance Programs Group as it becomes available.

* * * * *

37. Section 90.805 is amended by revising paragraph (a) to read as follows:

§ 90.805 Reports, voluntary recall plan filing, record retention.

(a) Send the defect report, voluntary recall plan, and the voluntary recall progress report to: Group Manager, Engine Compliance Programs Group, (6403-J), Environmental Protection Agency, Washington, D.C. 20460.

* * * * *

38. A new § 90.808 is added to subpart I read as follows

§ 90.808 Ordered recall provisions.

(a) Effective with respect to Phase 2 small SI engines:

(1) If the Administrator determines that a substantial number of any class or category of engines, although properly maintained and used, do not conform to the regulations prescribed under section 213 of the Act when in actual use throughout their useful life (as defined under § 90.105), the Administrator shall immediately notify the manufacturer of such nonconformity and require the manufacturer to submit a plan for remedying the nonconformity of the engines with respect to which such notification is given.

(i) The manufacturer's plan shall provide that the nonconformity of any such engines which are properly used and maintained will be remedied at the expense of the manufacturer.

(ii) If the manufacturer disagrees with such determination of nonconformity and so advises the Administrator, the Administrator shall afford the manufacturer and other interested persons an opportunity to present their views and evidence in support thereof at a public hearing. Unless, as a result of such hearing, the Administrator withdraws such determination of nonconformity, the Administrator shall, within 60 days after the completion of

such hearing, order the manufacturer to provide prompt notification of such nonconformity in accordance with paragraph (a)(2) of this section. The manufacturer shall comply in all respects with the requirements of this subpart.

(2) Any notification required to be given by the manufacturer under paragraph (a)(1) of this section with respect to any class or category of engines shall be given to dealers, ultimate purchasers, and subsequent purchasers (if known) in such manner and containing such information as required in subparts I and M of this part.

(3)(i) Prior to an EPA ordered recall, the manufacturer may perform a voluntary emissions recall pursuant to regulations at § 90.804. Such manufacturer is subject to the reporting and recordkeeping requirements of § 90.805.

(ii) Once EPA determines that a substantial number of engines fail to conform with the requirements of section 213 of the Act or this part, the manufacturer will not have the option of a voluntary recall.

(b) The manufacturer bears all cost obligation a dealer incurs as a result of a requirement imposed by paragraph (a) of this section. The transfer of any such cost obligation from a manufacturer to a dealer through franchise or other agreement is prohibited.

(c) Any inspection of an engine for purposes of paragraph (a)(1) of this section, after its sale to the ultimate purchaser, is to be made only if the owner of such vehicle or engine voluntarily permits such inspection to be made, except as may be provided by any state or local inspection program.

Subpart J—Exclusion and Exemption of Nonroad Engines From Regulations

39. Section 90.905 is amended by revising paragraph (f) to read as follows:

§ 90.905 Testing exemption.

* * * * *

(f) A manufacturer of new nonroad engines may request a testing exemption to cover nonroad engines intended for use in test programs planned or anticipated over the course of a subsequent one-year period. Unless otherwise required by the Director, Engine Programs and Compliance Division, a manufacturer requesting such an exemption need only furnish the information required by paragraphs (a)(1) and (d)(2) of this section along with a description of the recordkeeping and control procedures that will be employed to assure that the engines are used for purposes consistent with § 90.1004(b).

40. Section 90.906 is amended by revising paragraphs (a) introductory text and (a)(3) introductory text to read as follows:

§ 90.906 Manufacturer-owned exemption and precertification exemption.

(a) Any manufacturer owned nonroad engine, as defined by § 90.902, is exempt from § 90.1003, without application, if the manufacturer complies with the following terms and conditions:

* * * * *

(3) Unless the requirement is waived or an alternative procedure is approved by the Director, Engine Programs and Compliance Division, the manufacturer must permanently affix a label to each nonroad engine on exempt status. This label should:

* * * * *

41. Section 90.909 is amended by revising paragraph (c) to read as follows:

§ 90.909 Export exemptions.

* * * * *

(c) EPA will maintain a list of foreign countries that have in force nonroad emission standards identical to U.S. EPA standards and have so notified EPA. This list may be obtained by writing to the following address: Group Manager, Engine Compliance Programs Group, Engine Programs and Compliance Division (6403-J), Environmental Protection Agency, Washington, D.C. 20460. New nonroad engines exported to such countries must comply with U.S. EPA certification regulations.

* * * * *

42. Section 90.911 is revised to read as follows:

§ 90.911 Submission of exemption requests.

Requests for exemption or further information concerning exemptions and/or the exemption request review procedure should be addressed to: Group Manager, Engine Compliance Programs Group, Engine Programs and Compliance Division (6403J), Environmental Protection Agency, Washington, D.C. 20460.

Subpart K—Prohibited Acts and General Enforcement Provisions

43. Section 90.1003 is amended by revising paragraphs (a)(2), (a)(4)(i), (b)(4), and (b)(5) and by redesignating paragraphs (a)(4)(iii) and (a)(4)(iv) as paragraphs (a)(4)(iv) and (a)(4)(v) respectively, and by adding new paragraphs (a)(4)(iii) and (b)(6) to read as follows:

§ 90.1003 Prohibited acts.

(a) * * *

(2) (i) For a person to fail or refuse to permit access to or copying of records or to fail to make reports or provide information required under § 90.1004.

(ii) For a person to fail or refuse to permit entry, testing or inspection authorized under §§ 90.126, 90.506, 90.705, 90.1004, or 90.1207.

(iii) For a person to fail or refuse to perform tests or to have tests performed as required under §§ 90.119, 90.504, 90.703, 90.1004, 90.1204.

(iv) For a person to fail to establish or maintain records as required under §§ 90.209, 90.704, 90.805, or 90.1004.

(v) For a person to fail to submit a remedial plan as required under § 90.808.

* * * * *

(4) * * *

(i) To sell, offer for sale, or introduce or deliver into commerce, a nonroad engine unless the manufacturer has complied with the requirements of § 90.1103.

* * * * *

(iii) To fail or refuse to comply with the requirements of § 90.808.

* * * * *

(b) * * *

(4) Certified nonroad engines shall be used in all equipment or vehicles that are self-propelled, portable, transportable, or are intended to be propelled while performing their function, unless the manufacturer of the equipment or vehicle can prove that the vehicle or equipment will be used in a manner consistent with paragraph (2) of the definition of *Nonroad engine* in § 90.3. Nonroad vehicle and equipment manufacturers may continue to use noncertified nonroad engines built prior to the applicable implementation date of the Phase 1 rule until noncertified engine inventories are depleted; further after the applicable implementation of the Phase 2 regulations in this part, nonroad vehicle and equipment manufacturers may continue to use Phase 1 engines until Phase 1 engine inventories are depleted. Stockpiling (i.e., build up of an inventory of uncertified engines or Phase 1 engines beyond normal business practices to avoid or delay compliance with the Phase 1 or Phase 2 regulations in this part, respectively) will be considered a violation of this section.

(5) A new nonroad engine, intended solely to replace an engine in a piece of nonroad equipment that was originally produced with an engine manufactured prior to the applicable implementation date as described in §§ 90.2, 90.103 and 90.106, or with an engine that was

originally produced in a model year in which less stringent standards under this part were in effect, shall not be subject to the requirements of § 90.106 or prohibitions and provisions of paragraphs (a)(1) and (b)(4) of this section provided that:

(i) The engine manufacturer has ascertained that no engine produced by itself or the manufacturer of the engine that is being replaced, if different, and certified to the requirements of this subpart, is available with the appropriate physical or performance characteristics to repower the equipment; and

(ii) The engine manufacturer or its agent takes ownership and possession of the old engine in partial exchange for the replacement engine; and

(iii) The replacement engine is clearly labeled with the following language, or similar alternate language approved in advance by the Administrator: THIS ENGINE DOES NOT COMPLY WITH FEDERAL NONROAD OR ON-HIGHWAY EMISSION REQUIREMENTS. SALE OR INSTALLATION OF THIS ENGINE FOR ANY PURPOSE OTHER THAN AS A REPLACEMENT ENGINE IN A NONROAD VEHICLE OR PIECE OF NONROAD EQUIPMENT WHOSE ORIGINAL ENGINE WAS NOT CERTIFIED, OR WAS CERTIFIED TO LESS STRINGENT EMISSION STANDARDS THAN THOSE THAT APPLY TO THE YEAR OF MANUFACTURE OF THIS ENGINE, IS A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY; and

(iv) Where the replacement engine is intended to replace an engine built after the applicable implementation date of regulations under this part, but built to less stringent emission standards than are currently applicable, the replacement engine shall be identical in all material respects to a certified configuration of the same or later model year as the engine being replaced.

(6)(i) Regulations elsewhere in this part notwithstanding, for three model years after the phase-in of Class I and Class II Phase 2 standards; i.e. through August 1, 2010 for Class I engines and through model year 2008 for Class II engines, small volume equipment manufacturers as defined in this part may continue to use, and engine manufacturers may continue to supply, engines certified to Phase 1 standards (or identified and labeled by their manufacturer to be identical to engines previously certified under Phase 1 standards), provided the equipment manufacturer has demonstrated to the satisfaction of the Administrator that no certified Phase 2 engine is available

with suitable physical or performance characteristics to power a piece of equipment in production prior to the initial effective date of Phase 2 standards, as indicated in 90.103(a). The equipment manufacturer must also certify to the Administrator that the equipment model has not undergone any redesign which could have facilitated conversion of the equipment to accommodate a Phase 2 engine.

(ii) Regulations elsewhere in this part notwithstanding, for the duration of the Phase 2 rule in this part, equipment manufacturers who certify to the Administrator that annual eligible production of a particular model of equipment will not exceed 500 for a Class I model in production prior to August 1, 2007 or a Class II model in production prior to the 2001 model year, may continue to use in that model, and engine manufacturers may continue to supply, engines certified to Phase 1 requirements, (or identified and labeled by their manufacturer to be identical to engines previously certified under Phase 1 standards). To be eligible for this provision, the equipment manufacturer must have demonstrated to the satisfaction of the Administrator that no certified Phase 2 engine is available with suitable physical or performance characteristics to power the equipment. The equipment manufacturer must also certify to the Administrator that the equipment model has not undergone any redesign which could have facilitated conversion of the equipment to accommodate a Phase 2 engine.

(iii) An equipment manufacturer which is unable to obtain suitable Phase 2 engines and which can not obtain relief under any other provision of this part, may, prior to the date on which the manufacturer would become in noncompliance with the requirement to use Phase 2 engines, apply to the Administrator to be allowed to continue using Phase 1 engines, through August 1, 2008 for Class 1 engines and through the 2006 model year for Class II engines, subject to the following criteria:

(A) The inability to obtain Phase 2 engines is despite the manufacturer's best efforts and is the result of an extraordinary action on the part of the engine manufacturer that was outside the control of and could not be reasonably foreseen by the equipment manufacturer; such as canceled production or shipment, last minute certification failure, unforeseen engine cancellation, plant closing, work stoppage or other such circumstance; and

(B) the inability to market the particular equipment will bring

substantial economic hardship to the equipment manufacturer resulting in a major impact on the equipment manufacturer's solvency.

(iv) The written permission from the Administrator to the equipment manufacturer shall serve as permission for the engine manufacturer to provide such Phase 1 engines required by the equipment manufacturers under this paragraph (b)(6) of this section. As Phase 1 engines, these engines are exempt from Production Line Testing requirements under subpart H of this part and in-use testing provisions under subpart M of this part, and are excluded from the certification averaging, banking and trading program of subpart C of this part.

Subpart L—Emission Warranty and Maintenance Instructions

44. Section 90.1103 is amended by revising paragraphs (a) and (b) to read as follows:

§ 90.1103 Emission warranty, warranty period.

(a) Warranties imposed by this subpart shall be for the first two years of engine use from the date of sale to the ultimate purchaser.

(b) The manufacturer of each new nonroad engine must warrant to the ultimate purchaser and each subsequent purchaser that the engine is designed, built and equipped so as to conform at the time of sale with applicable regulations under section 213 of the Act, and the engine is free from defects in materials and workmanship which cause such engine to fail to conform with applicable regulations for its warranty period.

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45. Section 90.1104 is amended by adding paragraph (e) to read as follows:

§ 90.1104 Furnishing of maintenance instructions to ultimate purchaser.

* * * * *

(e) If a manufacturer includes in an advertisement a statement respecting the cost or value of emission control devices or systems, the manufacturer shall set forth in the statement the cost or value attributed to these devices or systems by the Secretary of Labor (through the Bureau of Labor Statistics). The Secretary of Labor, and his or her representatives, has the same access for this purpose to the books, documents, papers, and records of a manufacturer as the Comptroller General has to those of a recipient of assistance for purposes of section 311 of the Act.

46. A new subpart, Subpart M is added to part 90 to read as follows:

Subpart M—Voluntary In-Use Testing

Sec.

- 90.1201 Applicability.
 90.1202 Definitions.
 90.1203 Voluntary Manufacturer In-use testing program.
 90.1204 Maintenance, aging and testing of engines.
 90.1205 In-use test program reporting requirements.
 90.1206 Reserved.
 90.1207 Entry and access.
 90.1208—90.1249 [Reserved]

Subpart M—Voluntary In-Use Testing**§ 90.1201 Applicability.**

The provisions of this subpart from § 90.1201 through § 90.1249 are applicable to all nonhandheld Phase 2 engines subject to the provisions of subpart A of this part.

§ 90.1202 Definitions.

For the purposes of this subpart, except as otherwise provided, the definitions in subparts A and C of this part apply to this subpart.

§ 90.1203 Voluntary Manufacturer In-Use Testing Program.

(a) Manufacturers may elect to participate in the voluntary in-use testing program by notifying the Administrator in writing of their intent to conduct emissions testing on in-use engines prior to the beginning of each model year. The notification must include a list of engine families the manufacturer has selected to include in the testing program.

(b) Each engine family included in the voluntary in-use testing program is exempted from the Production Line Testing requirements according to § 90.701(c) for two model years, the current model year and the subsequent model year. Manufacturers may only include up to twenty percent of their eligible engine families in this in-use testing program each model year.

(c) The manufacturer must randomly select or procure a minimum of three engines, from each family included in the voluntary program, for emissions testing. These three engines may be selected or procured from:

- (1) Existing consumer or independently owned fleets,
- (2) Existing manufacturer owned fleets, or
- (3) The production line and placed into either manufacturer or consumer owned fleets. Although a minimum of three engines must be emissions tested from each engine family in this testing program, a manufacturer may elect to emissions test more than three engines per family.

(d) The manufacturer or the manufacturer's designee must:

- (1) Age the selected engines in equipment representing the top 50 percent, by production, of available equipment for the engine family.
- (2) Age the selected engines to at least 75 percent of each engines' useful life as determined pursuant to § 90.105.
- (3) Age the engine/equipment combination in actual field conditions encountered with typical use of the equipment as described in the owner's manual or other literature sold with the equipment or engine.

(e) Documents obtained in the procurement or aging process must be maintained as required in § 90.121.

(f) The manufacturer must complete testing within three calendar years from the time they notified the Administrator of their intent to participate in the voluntary in-use testing program, unless otherwise approved by the Administrator; the Administrator will give such approval upon acceptance of documentation demonstrating that appropriate in-use testing will take a longer period of time.

§ 90.1204 Maintenance, aging and testing of engines.

(a) Prior to aging the engines and after appropriate stabilization, manufacturers may optionally conduct emissions testing on the engines, according to the test procedures described in subpart E of this part. These tests to serve as baseline references.

(b) Manufacturers must obtain information regarding the accumulated usage, maintenance, operating conditions, and storage of the test engines.

(1) The manufacturer may take reasonable measures to assure that the engines and equipment were properly used and maintained during the field aging process, but additional maintenance to that indicated in the owners manual or other literature sold with the equipment or engine is prohibited.

(2) Unless otherwise approved by the Administrator, once a manufacturer begins aging and/or testing an engine, the manufacturer may not remove that engine from the selected sample unless that engine experiences catastrophic mechanical failure or safety concerns requiring major engine repair.

(c) The manufacturer may perform minimal set-to-spec maintenance on components of a test engine that are not subject to parameter adjustment. Components subject to parameter adjustment must be sealed and tamperproof and may not be adjusted for testing. Unless otherwise approved

by the Administrator, maintenance to any test engine may include only that which is listed in the owner's instructions for engines with the amount of service and age of the test engine.

(d) After aging each engine to at least 75 percent of the engine's useful life as determined pursuant to § 90.105, at least one valid emission test, according to the test procedure outlined in subpart E of this part, is required for each test engine. Data from other emission testing or performance testing performed on a test engine must be supplied to EPA, and may not be used for the purpose of determining the need for maintenance on an engine.

(e) Documents obtained in the procurement, aging, maintenance, or testing process must be maintained as required in § 90.121.

§ 90.1205 In-use test program reporting requirements.

(a) The manufacturer shall submit to the Administrator within ninety (90) days of completion of testing for a given model year's engines, all emission testing results generated from the voluntary in-use testing program. The following information must be reported for each test engine:

- (1) Engine family;
- (2) Model;
- (3) Application;
- (4) Engine serial number;
- (5) Date of manufacture;
- (6) Hours of use;
- (7) Date and time of each test attempt;
- (8) Results (if any) of each test attempt;
- (9) Schedules, descriptions and justifications of all maintenance and/or adjustments performed;
- (10) Schedules, descriptions and justifications of all modifications and/or repairs; and
- (11) A listing of any test engines that were deleted from the aging process or testing process and technical justifications to support the deletion.

(b) All testing reports and requests for approvals made under this subpart shall be addressed to: Manager, Engine Compliance Programs Group (6403-J), U.S. Environmental Protection Agency, Washington, D.C. 20460.

§ 90.1206 [Reserved]**§ 90.1207 Entry and access.**

(a) To allow the Administrator to determine whether a manufacturer is complying with the provisions under this subpart, EPA enforcement officers or their authorized representatives, upon presentation of credentials, shall be permitted entry, during operating hours, into any of the following places:

(1) Any facility where engines undergo or are undergoing aging, maintenance, repair, preparation for aging, selection for aging or emission testing.

(2) Any facility where records or documents related to any of activities described in paragraph (a)(1) of this section are kept.

(3) Any facility where any engine that is being tested or aged, was tested or aged or will be tested or aged is present.

(b) Upon admission to any facility referred to in paragraph (a) of this section, EPA enforcement officers or EPA authorized representatives are authorized to perform those activities set forth in § 90.705 (b) and also to inspect and make copies of records

related to engine aging (service accumulation) and maintenance.

(c) The provisions of § 90.705(c), (d), (e), (f) and (g) also apply to entry and access under this subpart.

§§ 90.1208—90.1249 [Reserved]

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