pose a challenge, but one that is feasible taking into consideration the availability and cost of technology, time, noise, energy, and safety.

VI. Recreational Vehicles and Engines

A. Overview

This section applies to recreational vehicles. We are proposing to set new emission standards for snowmobiles, off-highway motorcycles, and all-terrain vehicles (ATVs). The engines used in these vehicles are a subset of nonroad SI engines.[137] In our program to set standards for nonroad SI engines below 19 kW (Small SI), we excluded recreational vehicles because they have different design characteristics and usage patterns than certain other engines in the Small SI category. For example, engines typically found in the Small SI category are used in lawn mowers, chainsaws, trimmers, and other lawn and garden applications. These engines tend to have low power outputs and operate at constant loads and speeds, whereas recreational vehicles can have high power outputs with highly variable engine loads and speeds. This suggests that these engines should be tested differently than Small SI engines. In the same way, we are proposing to treat snowmobiles, off-highway motorcycles, and ATVs separately from our Large SI engine program, which is described in Section IV. For recreational vehicles that are not snowmobiles, off-highway motorcycles, or ATVs, we propose to apply the standards otherwise applicable to nonroad SI engines (see Section VI.B.2).

We are proposing emission standards for hydrocarbons (HC), and carbon monoxide (CO) from all recreational vehicles and NO_X from off-highway motorcycles and ATVs. Many of these vehicles use two-stroke engines which emit high levels of HC and CO. We believe that vehicle and engine manufacturers will be able to use technology already established for other types of engines, such as highway motorcycles, small spark-ignition engines, and marine engines, to meet these near-term standards. To encourage the introduction of low-emission technology such as catalytic control and the conversion from two-stroke to four-stroke engines, we are also proposing a Voluntary Low Emission Standards program. We also recognize that there are many small businesses that manufacture recreational vehicles; we are therefore proposing several regulatory special compliance provisions to reduce the burden of emission regulations on small businesses.

1. What Are Recreational Vehicles and Who Makes Them?

We are proposing to adopt new emission standards for off-highway motorcycles, all-terrain vehicles (ATVs), and snowmobiles. Eight manufacturers dominate the sales of these recreational vehicles. Of these eight manufacturers, seven of them manufacture a combination of two or more of the three main types of recreational vehicles. For example, there are four companies that manufacture both off-highway motorcycles and ATVs. There are three companies that manufacture ATVs and snowmobiles; one company manufactures all three. These eight companies represent approximately 95 percent of all domestic sales of recreational vehicles.

a. Off-highway motorcycles. Motorcycles come in a variety of configurations and styles. For the most part, however, they are two-wheeled, self-powered vehicles. Off-highway motorcycles are similar in appearance to highway motorcycles, but there are several important distinctions between the two types of machines. Off-highway motorcycles are not street-legal and are primarily operated on public and private lands over trails and open areas. Off-highway motorcycles tend to be much smaller, lighter and more maneuverable than their larger highway counterparts. They are equipped with relatively small-displacement single-cylinder two-or four-stroke engines ranging from 48 to 650 cubic centimeters (cc). The exhaust systems for off-highway motorcycles are distinctively routed high on the frame to prevent damage from brush, rocks, and water. Off-highway motorcycles are designed to be operated over varying surfaces, such as dirt, sand, or mud, and are equipped with knobby tires to give better traction in off-road conditions. Unlike highway motorcycles, off-highway motorcycles have fenders mounted far from the wheels and closer to the rider to keep dirt and mud from spraying the rider and clogging between the fender and tire. Off-highway motorcycles are also equipped with more advanced suspension systems than those for highway motorcycles. This allows the operator to ride over obstacles and make jumps safely.

Five companies dominate sales of off-highway motorcycles. They are long-established, large corporations that manufacture several different products including highway and off-highway motorcycles. These five companies account for 90 to 95 percent of all domestic sales of off-highway motorcycles. There are also several relatively small companies that manufacture off-highway motorcycles, many of which specialize in racing or competition machines.

b. All-terrain vehicles. ATVs have been in existence for a long time, but have become increasingly popular over the last 25 years. Some of the earliest and most popular ATVs were three-wheeled off-highway models with large balloon tires. Due to safety concerns, the three-wheeled ATVs were phased-out in the mid-1980s and replaced by the current and more popular four-wheeled vehicle known as ''quad runners'' or simply ''quads.'' Quads resemble the earlier three-wheeled ATVs except that the single front wheel was replaced with two wheels controlled by a steering system. The ATV steering system uses motorcycle handlebars, but otherwise looks and operates like an automotive design. The operator sits on and rides the quad much like a motorcycle. The engines used in quads tend to be very similar to those used in off-highway motorcycles—relatively small, single-cylinder two- or four-stroke engines. Quads are typically divided into utility and sport models. The utility quads are designed for recreational use but have the ability to perform many utility functions, such as plowing snow, tilling gardens, and mowing lawns. They are typically heavier and equipped with relatively large four-stroke engines and automatic transmissions with a reverse gear. Sport quads are smaller and designed primarily for recreational purposes. They are equipped with two- or four-stroke engines and manual transmissions.

There are two other less common types of ATVs, both of which are six-wheeled models. One looks similar to a large golf cart with a bed for hauling cargo, much like a pick-up truck. These ATVs are typically manufactured by the same companies that make quad runners and use similar engines. The other can operate both in water and on land. These amphibious ATVs typically have small gasoline-powered engines similar to those found in lawn and garden tractors, rather than the motorcycle engines used in quads, though some use automotive-based Large SI engines.

Of all of the types of recreational vehicles, ATVs have the largest number of major manufacturers. All but one of the companies noted above for off-highway motorcycles and snowmobiles are significant ATV producers. These seven companies represent over 95

[137] Almost all recreational vehicles are equipped with SI engines. Any diesel engines used in these applications must meet our emission standards for nonroad diesel engines.

percent of total domestic ATV sales. The remaining 5 percent of sales come from importers, which tend to import less expensive, youth-oriented ATVs.

c. Snowmobiles. Snowmobiles, also referred to as ''sleds,'' are tracked vehicles designed to operate over snow. Snowmobiles have some similarities to off-highway motorcycles and ATVs. A snowmobile rider sits on and rides a snowmobile similar to an ATV. Snowmobiles use high-powered two- and three-cylinder two-stroke engines that look similar to off-highway motorcycle engines. Rather than wheels, snowmobiles are propelled by a track system similar to what is used on a bulldozer. The snowmobile is steered by two skis at the front of the sled. Snowmobiles use handlebars similar to off-highway motorcycles and ATVs. The typical snowmobile seats two riders comfortably. Over the years, snowmobile performance has steadily increased to the point that many snowmobiles currently have engines over 100 horsepower and are capable of exceeding 100 miles per hour. The proposed definition for snowmobiles includes a limit of 1.5-meter width to differentiate conventional snowmobiles from ice-grooming machines and snow coaches, which use very different engines. We request comment on this definition and on any other approaches to differentiate these products.

There are four major snowmobile manufacturers, accounting for more than 99 percent of all domestic sales. The remaining sales come from very small manufacturers who tend to specialize in expensive, high-performance designs.

d. Other recreational vehicles. Currently, our Small SI nonroad engine regulations cover all recreational engines that are under 19 kW (25 hp) and have either an installed speed governor or a maximum engine speed less than 5,000 rpm. Recreational vehicles currently covered by the Small SI standards include go-carts, golf carts, and small mini-bikes. Although some off-highway motorcycles, ATVs and snowmobiles have engines with rated horsepower less than 19 kW, they all have maximum engine speeds greater than 5,000 rpm. Thus they have not been included in the Small SI regulations. The only other types of small recreational engines not covered by the Small SI rule are those engines under 19 kW that aren't governed and have maximum engine speed of at least 5,000 rpm. There are relatively few such vehicles with recreational engines not covered by the Small SI regulations. The best example of vehicles that fit in this category are scooters and skateboards that are powered by very small gasoline spark-ignition engines. The engines used on these vehicles are typically the same as those used in string trimmers or other lawn and garden equipment, which are covered under the Small SI regulations. Because these engines are generally already covered by the Small SI regulations and are the same as, or very similar to, engines as those used in lawn and garden applications, we are proposing to revise the Small SI rules to cover these engines under the Small SI regulations. To avoid any problems in transitioning to meet emission standards, we propose to apply these standards in 2006. We request comments on these issues.

2. What Is the Regulatory History for Recreational Vehicles?

California ARB established standards for off-highway motorcycles and ATVs, which took effect in January 1997 (1999 for vehicles with engines of 90 cc or less). California has not adopted standards for snowmobiles. The standards, shown in Table VI.A–1, are based on the highway motorcycle chassis test procedures. Manufacturers may certify ATVs to optional standards, also shown in Table VI.A–1, which are based on the utility engine test procedure.[138] This is the test procedure over which Small SI engines are tested. The stringency level of the standards was based on the emission performance of 4-stroke engines and advanced 2-stroke engines with a catalytic converter. California ARB anticipated that the standards would be met initially through the use of high performance 4-stroke engines.

TABLE VI.A–1.—CALIFORNIA OFF-HIGHWAY MOTORCYCLE AND ATV STANDARDS FOR MODEL YEAR 1997 AND LATER

[1999 and later for engines at or below 90 cc]

	HC	NO_X	CO	PM
Off-highway motorcycle and ATV standards (g/km)	[a]1.2	.....	15	.....

	HC + NO_X	CO	PM
Optional standards for ATV engines below 225 cc (g/bhp-hr)	[a]12.0	300	.....
Optional standards for ATV engines at or above 225 cc (g/bhp-hr)	[a]10.0	300	.....

[a] Corporate-average standard.

California revisited the program because a lack of certified product from manufacturers was reportedly creating economic hardship for dealerships. The number of certified off-highway motorcycle models was particularly inadequate.[139] In 1998, California revised the program, allowing the use of uncertified products in off-highway vehicle recreation areas with regional/seasonal use restrictions. Currently, noncomplying vehicles may be sold in California and used in attainment areas year-round and in nonattainment areas during months when exceedances of the state ozone standard are not expected. For enforcement purposes, certified and uncertified products are identified with green and red stickers, respectively. Only about one-third of off-highway motorcycles selling in California are certified. All certified products have 4-stroke engines.

B. Engines Covered by This Proposal

We are proposing new emission standards for all new off-highway motorcycles, all-terrain vehicles (ATVs), and snowmobiles. We are also proposing to apply existing Small SI emission standards to other recreational vehicles, as described above. The engines used in these vehicles tend to be small, air-or liquid-cooled, reciprocating Otto-cycle engines that operate on gasoline.[140] With the exception of what we define as ''other recreational vehicles,'' these engines are designed to be used in vehicles, where engine performance is characterized by highly transient operation, with a wide range of engine speed and load capability. Maximum engine speed is typically well above 5,000 rpm. Also, with the exception of snowmobiles, the vehicles are typically equipped with transmissions rather than torque converters to ensure performance under a variety of operating conditions.[141]

[138] Notice of Off-Highway Recreational Vehicle Manufacturers and All Other Interested Parties Regarding Alternate Emission Standards for All-Terrain Vehicles, Mail Out #95–16, April 28, 1995, California ARB (Docket A–2000–01, document II–D–06).

[139] Initial Statement of Reasons, Public Hearing to Consider Amendments to the California Regulations for New 1997 and Later Off-highway Recreational Vehicles and Engines, California ARB, October 23, 1998 (Docket A–2000–01, document II–D–08).

[140] Otto cycle is another name for a spark-ignition engine which utilizes a piston with homogeneous external or internal air and fuel mixture formation and spark ignition.

[141] Snowmobiles use continuously variable transmissions, which tend to operate like torque converters.

1. Two-Stroke vs. Four-Stroke Engines

The engines used by recreational vehicles can be separated into two distinct designs: two-stroke and four-stroke. The distinction between two-stroke and four-stroke engines is important for emissions because two-stroke engines tend to emit much greater amounts of unburned hydrocarbons (HC) and particulate matter (PM) than four-stroke engines of similar size and power. Two-stroke engines also have greater fuel consumption than four-stroke engines, but they also tend to have higher power output per-unit displacement, lighter weight, and better cold-starting performance. These advantages, combined with a simple design and lower manufacturing costs, tend to make two-stroke engines popular as a power unit for recreational vehicles. With the exception of a few youth models, almost all snowmobiles use two-stroke engines. Currently, about 63 percent of all off-highway motorcycles (predominantly in high performance, youth, and entry-level bikes) and 20 percent of all ATVs sold in the United States use two-stroke engines.

The basis for the differences in engine performance and exhaust emissions between two-stroke and four-stroke engines can be found in the fundamental differences in how two-stroke and four-stroke engines operate. Four-stroke operation takes place in four distinct steps: intake, compression, power, and exhaust. Each step corresponds to one up or down stroke of the piston or 180° of crankshaft rotation. The first step of the cycle is for an intake valve in the combustion chamber to open during the intake stroke, allowing a mixture of air and fuel to be drawn into the cylinder while the piston moves down the cylinder. The intake valve then closes and the momentum of the crankshaft causes the piston to move back up the cylinder, compressing the air and fuel mixture. At the very end of the compression stroke, the air and fuel mixture is ignited by a spark from a spark plug and begins to burn. As the air and fuel mixture burns, increasing temperature and pressure cause the piston to move back down the cylinder. This is referred to as the ''power'' stroke. At the bottom of the power stroke, an exhaust valve opens in the combustion chamber and as the piston moves back up the cylinder, the burnt gases are pushed out through the exhaust valve to the exhaust manifold, and the cycle is complete.

In a four-stroke engine, combustion and the resulting power stroke occur only once every two revolutions of the crankshaft. In a two-stroke engine, combustion occurs every revolution of the crankshaft. Two-stroke engines eliminate the intake and exhaust strokes, leaving only compression and power strokes. This is due to the fact that two-stroke engines do not use intake and exhaust valves. Instead, they have intake and exhaust ports in the sides of the cylinder walls. With a two-stroke engine, as the piston approaches the bottom of the power stroke, it uncovers exhaust ports in the wall of the cylinder. The high pressure combustion gases blow into the exhaust manifold. As the piston gets closer to the bottom of the power stroke, the intake ports are uncovered, and fresh mixture of air and fuel are forced into the cylinder while the exhaust ports are still open. Exhaust gas is ''scavenged'' or forced into the exhaust by the pressure of the incoming charge of fresh air and fuel. In the process, however, some mixing between the exhaust gas and the fresh charge of air and fuel takes place, so that some of the fresh charge is also emitted in the exhaust. Losing part of the fuel out of the exhaust during scavenging causes very high hydrocarbon emission characteristics of two-stroke engines. The other major reason for high HC emissions from two-stroke engines is their tendency to misfire under low-load conditions due to greater combustion instability.

2. Applicability of Small SI Regulations

In our regulations for Small SI engines, we established criteria, such as rated engine speed at or above 5,000 rpm and the use of a speed governor, that excluded engines used in certain types of recreational vehicles (see 40 CFR § 90.1(b)(5)). Engines used in some other types of recreational vehicles may be covered by the Small SI standards, depending on the characteristics of the engines. For example, lawnmower-type engines used in go carts would typically be covered by the Small SI standards because they don't operate above 5000 rpm. Similarly, engines used in golf carts are also included in the Small SI program. As discussed above, we are proposing to revise the Small SI regulations to include all recreational engines except those in off-highway motorcycles, ATVs, snowmobiles, and hobby engines. We are proposing to remove the 5,000 rpm and speed governor criteria from the applicability provisions of the Small SI regulations.

There may, however, be instances where an ATV, off-road motorcycle, or snowmobile manufacturer currently uses a certified small utility engine in their vehicle, and could be required to recertify that engine to the recreational vehicle standards in the future. Relatively slow-moving amphibious ATVs would be one example where certified small utility engines may be used. We request comment on whether or not we should allow off-road motorcycles, ATVs, and snowmobiles to be certified to the Small SI standards in cases where a manufacturer has chosen to use a certified small utility engine. We also request comment on retaining the 5,000-rpm rated speed criteria for determining the applicability of the Small SI standards for snowmobiles, ATVs, and off-road motorcycles. Further, we request comment and information on any vehicles that currently have an engine certified to Small SI standards which would be required to certify to the recreational vehicle standards due to this regulatory change.

3. Hobby Engines

The Small SI rule categorized SI engines used in model cars, boats, and airplanes as recreational engines and exempted them from the Small SI program.[142] We continue to believe that it would be inappropriate to include hobby engines in the Small SI program because of significant engine design and use differences. At this time, we also believe that hobby engines are substantially different than engines used in recreational vehicles and, as discussed below, we are not proposing to include SI hobby engines in this proposal.

There are about 8,000 spark-ignition engines sold per year for use in scale-model aircraft, cars, and boats.[143] This is a very small subsection of the overall model engine market, most of which are glow-plug engines that run on a mix of castor oil, methyl alcohol, and nitro methane.[144] A typical SI hobby engine is approximately 25 cc with a horsepower rating of about 1–3 hp, though larger engines are available. These SI engines are specialty products sold in very low volumes, usually not more than a few hundred units per engine line annually. Many of the engines are used in model airplanes, but they are also used in other types of models such as cars and boats. These engines, especially the larger

[142] 65 FR 24929, April 25, 2000.

[143] Comments submitted by Hobbico on behalf of Great Plains Model Distributors and Radio Control Hobby Trade Association, February 5, 2001, Docket A–2000–01, document II–D–58.

[144] Glow plug hobby engines are considered compression ignition engines (diesel) because they lack a spark ignition system and throttle (see definition of compression ignition, 40 CFR § 89.2). The nonroad diesel engine regulations (40 CFR § 89.2) do not apply to hobby engines and therefore these engines are unregulated.

displacement models, are frequently used in competitive events by more experienced operators. The racing engines sometimes run on methanol instead of gasoline. In addition, the engines are usually installed and adjusted by the hobbyist who selects an engine that best fits the particular model being constructed.

The average annual hours of operation has been estimated to be about 12.2 hours per year.[145] The usage rate is very low compared to other recreational or utility engine applications due to the nature of their use. Much of the hobby revolves around building the model and preparing the model for operation. The engine and model must be adjusted, maintained, and repaired between uses.

SI model engines are highly specialized and differ significantly in design compared to engines used in other recreational or utility engine applications. While some of the basic components such as pistons may be the similar, the materials, airflow, cooling, and fuel delivery systems are considerably different.[146] [147] Some SI model engines are scale replicas of multi-cylinder aircraft or automobile engines and are fundamentally different than SI engines used in other applications. Model-engine manufacturers often select lighter-weight materials and simplified designs to keep engine weight down, often at the expense of engine longevity. Hobby engines use special ignition systems designed specifically for the application to be lighter than those used in other applications. To save weight, hobby engines typically lack pull starters that are found on other engines. Hobby engines must be started by spinning the propeller. In addition, the models themselves vary significantly in their design, introducing packaging issues for engine manufacturers.

We are not proposing to include SI hobby engines in the recreational vehicles program at this time. The engines differ significantly from the recreational engines included in the proposal in their design and use, as noted above. Emission-control strategies envisioned for other recreational vehicles may not be well suited for hobby engines because of their design, weight constraints, and packaging limitations. Approaches such as using a 4-stroke engine, a catalyst, or fuel injection all would involve increases in weight, which would be particularly problematic for model airplanes. The feasibility of these approaches for these engines is questionable. Reducing emissions, even if feasible, would likely involve fundamental engine redesign and substantial R&D efforts. The costs of achieving emission reductions are likely to be much higher per engine than for other recreational applications because the R&D costs would be spread over very low sales volumes. The cost of fundamentally redesigning the engines could double the cost of some engines.

By contrast, because of their very low sales volumes, annual usage rates, and relatively short engine life cycle, SI hobby engine emission contributions are extremely small compared to recreational vehicles. The emission reductions possible from regulating such engines would be minuscule (we estimate that SI hobby engines as a whole account for less than 30 tons of HC nationally per year, much less than 0.01% of Mobile Source HC emissions).[148] Thus, the cost per ton associated with regulating such engines would be well above any regulations previously adopted under the mobile source program (we estimate potential cost per ton for HC to over $200,000 per ton compared to less than $2,500 per ton for most other mobile source programs).

In addition, hobby engines differ significantly in their in-use operating characteristics compared to small utility engines and other recreational vehicle engines. It is unclear if the test procedures developed and used for other types of SI engine applications would be sufficiently representative for hobby engines. We are not aware of any efforts to develop an emission test cycle or conduct any emission testing of these engines. In addition, because installing, optimizing, maintaining, and repairing the engines are as much a part of the hobby as operating the engine, emission standards could fundamentally alter the hobby itself. Engines with emission-control systems would be more complex and the operator would need to be careful not to make changes that would cause the engine to exceed emission standards.

For all the above reasons, we do not have adequate information and are not able to propose emission standards and test procedures for SI hobby engines at this time. We request comment on the above points, including feasibility, cost, and benefits associated with potential control technologies for these engines. We also request comment on any other information or unique characteristics of hobby engines that should be taken into consideration.

4. Competition Off-Highway Motorcycles

Currently, a large portion of off-highway motorcycles are designed as competition/racing motorcycles. These models often represent a manufacturer's high-performance offerings in the off-highway market. Most such motorcycles are of the motocross variety, although some high performance enduro models are marketed for competition use.[149] [150] These high-performance motorcycles are largely powered by 2-stroke engines, though some 4-stroke models have been introduced in recent years.

Competition events for motocross motorcycles mostly involve closed-course or track racing. Other types of off-highway motorcycles are usually marketed for trail or open-area use. When used for competition, these models are likely to be involved in point-to-point competition events over trails or stretches of open land. There are also specialized off-highway motorcycles that are designed for competitions such as ice racing, drag racing, and observed trials competition. A few races involve professional manufacturer-sponsored racing teams. Amateur competition events for off-highway motorcycles are also held frequently in many areas of the U.S.

Clean Air Act subsections 216 (10) and (11) exclude engines and vehicles ''used solely for competition'' from nonroad engine and nonroad vehicle regulations. In our previous nonroad

[145] Comments submitted by Hobbico on behalf of Great Plains Model Distributors and Radio Control Hobby Trade Association, February 5, 2001, Docket A–2000–01, document II–D–58.

[146] E-mail from Carl Maroney of the Academy of Model Aeronautics to Christopher Lieske, of EPA, June 4, 2001, Docket A–2000–01, document II–G–144.

[147] Comments submitted by Hobbico on Behalf of Great Plains Model Distributors and Radio Control Hobby Trade Association, February 5, 2001, Docket A–2000–01, document II–D–58.

[148] For further information on the feasibility, emission inventories, and costs, see ''Analysis of Spark Ignition Hobby Engines'', Memorandum from Chris Lieske to Docket A–2000–01, document II–G–144.

[149] A motocross bike is typically a high performance off-highway motorcycle that is designed to be operated in motocross competition. Motocross competition is defined as a circuit race around an off-highway closed-course. The course contains numerous jumps, hills, flat sections, and bermed or banked turns. The course surface usually consists of dirt, gravel, sand, and mud. Motocross bikes are designed to be very light for quick handling and easy maneuverability. They also come with large knobby tires for traction, high fenders to protect the rider from flying dirt and rocks, aggressive suspension systems that allow the bike to absorb large amounts of shock, and are powered by high performance engines. They are not equipped with lights.

[150] An enduro bike is very similar in design and appearance to a motocross bike. The primary difference is that enduros are equipped with lights and have slightly different engine performance that is more geared towards a broader variety of operation than a motocross bike. An enduro bike needs to be able to cruise at high speeds as well as operate through tight woods or deep mud.

engine emission-control programs, we have generally defined the term as follows:

> Used solely for competition means exhibiting features that are not easily removed and that would render its use other than in competition unsafe, impractical, or highly unlikely.

If retained for the recreational vehicles program, the above definition may be useful for identifying certain models that are clearly used only for competition. For example, there are motorcycles identified as ''observed trials'' motorcycles which are designed without a standard seat because the rider does not sit down during competition. This feature would make recreational use unlikely:)

Most motorcycles marketed for competition do not appear to have obvious physical characteristics that constrain their use to competition. Upon closer inspection, however, there are several features and characteristics for many competition motorcycles that would make recreational use unlikely. For example, motocross bikes are not equipped with lights or a spark arrester, which prohibits them from legally operating on public lands (e.g., roads, parks, state land, federal land, etc.).[151] Vehicle performance of modern motocross bikes are so advanced (e.g., extremely high power-to-weight ratios and advanced suspension systems) that it is highly unlikely that these machines would be used for recreational purposes. In addition, motocross and other competition off-highway motorcycles typically do not come with a warranty, which would further deter the purchase and use of competition bikes for recreational operation.[152] We believe these features should be sufficient in distinguishing competition motorcycles from recreational motorcycles. We are specifically proposing the following features as indicative of motorcycles used solely for competition: absence of a headlight or other lights; the absence of a spark arrester; suspension travel greater than 10 inches; and an engine displacement greater than 50 cc.

Vehicles not meeting the applicable criteria listed above would be excluded only in cases where the manufacturer has clear and convincing evidence that the vehicles for which the exemption is being sought will be used solely for competition. Examples of this type of evidence could be technical rationale explaining the differences between a competition and non-competition motorcycle, marketing and/or sales information indicating the intent of the motorcycle for competition purposes, or survey data from users indicating the competitive nature of the motorcycle.

Although there are several features that distinguish competition motorcycles from recreational motorcycles, several parties have commented that they believe motorcycles designed for competition use may be used for recreational purposes, rather than solely for competition. This is of particular concern because competition motorcycles represent about 29 percent of total off-highway motorcycle sales or approximately 43,000 units per year. However, a study on the characterization of off-highway motorcycle usage found that there are numerous—and increasingly popular—amateur off-highway motorcycle competitions across the country, especially motocross.[153] The estimated number of off-highway motorcycle competitors is as high as 80,000. Since it is very common for competitive riders to replace their machines every one to two years, the sale of 43,000 off-highway competition motorcycles appears to be a reasonable number, considering the number of competitive participants. We are therefore confident that, although we are proposing to exclude a high percentage of off-highway motorcycles as being competition machines, this definition is appropriate because a high percentage of these motorcycles are in fact used solely for competition.

We are very interested in receiving input on the proposed competition exclusion. We request comment on ways the program can be established to exclude motorcycles used solely for competition, consistent with the Act, without excluding vehicles that are also used for other purposes. We specifically request comment on the identifying characteristics of competition vehicles in § 1051.620 of the proposed regulations. Ideally, the program can be established in a way that provides reasonable certainty at certification. However, approaches could include reasonable measures at time of sale or in-use that would ensure that the competition exclusion is applied appropriately.

C . Proposed Standards

1. What Are the Proposed Standards and Compliance Dates?

a. Off-highway Motorcycles and ATVs. We are proposing HC plus NO_X and CO standards for off-highway motorcycles and ATVs. We expect the largest benefit to come from reducing HC emissions from two-stroke engines. Two-stroke engines have very high HC emission levels. Baseline NO_X levels are relatively low for engines used in these applications and therefore NO_X standards serve only to cap NO_X emissions for these engines. Comparable CO reductions can be expected from both 2-stroke and 4-stroke engines, as CO levels are similar for the two engine types. We are also proposing averaging, banking and trading provisions for off-highway motorcycles and ATVs, as discussed below.

2006 Standards. In the current off-highway motorcycle and ATV market, consumers can choose between two-stroke and four-stroke models in most sizes and categories. Each engine type offers unique performance characteristics. Some manufacturers specialize in two-stroke or four-stroke models, while others offer a mix of models. The HC standard is likely to be a primary determining factor for what technology manufacturers choose to employ to meet emission standards overall. HC emissions can be reduced substantially by switching from two-stroke to four-stroke engines. Four-stroke engines are very common in off-highway motorcycle and ATV applications. Eighty percent of all ATVs sold are four-stroke. In addition, approximately 55 percent of non-competition off-highway motorcycles are four-stroke. Certification results from California ARB's emission-control program for off-highway motorcycles and ATVs, combined with our own baseline emission testing, provides ample data on the emission-control capability of four-stroke engines in off-highway motorcycles and ATV applications. Off-highway motorcycles certified to California ARB standards for the 2000 model year have HC certification levels ranging from 0.4 to 1.0 g/km. These motorcycles have engines ranging in size from 48 to 650 cc; none of these use catalysts.

In determining what standards to set for off-highway motorcycles and ATVs, we considered several approaches. One approach was to establish separate standards for two-stroke and four-stroke engines. This would take into

[151] A spark arrester is a device located in the end of the tailpipe that catches carbon sparks coming from the engine before they get out of the exhaust system. This is important when a bike is used off-highway, where hot carbon sparks falling in grassy or wooded areas could result in fires.

[152] Most manufacturers of motocross racing motorcycles do not offer a warranty. Some manufacturers do, however, offer very limited (1 to 3 months) warranties under special conditions.

[153] Characterization of Off-Road Motorcycle, ICF Consulting, September 2001, A–2000–1 document II–A–81.

consideration the fact that it could be expensive and difficult for two-stroke engines to meet the same emission levels as four-stroke engines. The problem with this approach is that two-stroke engines emit up to 25 times more HC emissions than four-stroke engines. Four stroke engines are currently being used on most, if not all, of the different subclasses of ATVs and off-highway motorcycles that we would be regulating, and we believe they can be used on all such subclasses. We are concerned that setting lesser standards for two-stroke engines could possibly result in the increase of two-stroke engine usage at the expense of four-stroke engines, which would result in a greater level of emissions and could miss the opportunity for a more appropriate and cost-effective standard. As a result, we proposing an approach that would require a single set of off-highway motorcycle and ATV standards for all engine types, similar to California ARB. We believe that this approach is consistent with our statutory requirement to propose standards that achieve the greatest emission reduction achievable, considering cost, noise, and safety factors.We ask for comment on this proposed approach and the rationale underlying this approach.

In 1994, California ARB adopted emission standards for off-highway motorcycles and ATVs. At the time, these standards were stringent enough that manufacturers were unable to provide performance-oriented off-highway motorcycles and ATVs that met the standards. As a result, ARB allowed manufacturers to sell non-compliant off-highway motorcycles and ATVs, resulting in approximately a third of the off-highway motorcycles and ATVs sold being compliant with the standards. Four-stroke engine technology has advanced considerably since the ARB regulations went into effect. Manufacturers are now capable of offering four-stroke engines that provide excellent performance. However, this performance can be achieved only as long as manufacturers are allowed to operate four-stroke engines with a slightly rich air and fuel mixture, which can result in somewhat higher HC and CO emissions. However, the HC emissions from four-stroke engines even when they operate rich are significantly lower than those from two-stroke engines. The market appears to be shifting to four-stroke technology.

As discussed above in Section # B.1.4, the CAA requires us to exempt from emission standards off-highway motorcycles and ATVs used for competition. We expect several competition off-highway motorcycle models, most equipped with two-stroke engines, to continue to be available. We are concerned that setting standards as stringent as ARB's would result in a performance penalty for four-strokes which could encourage consumers who want performance-oriented off-highway motorcycles to purchase competition vehicles in lieu of purchasing compliant machines that don't provide the desired performance. That is why we are proposing emission standards that are slightly less stringent than the California ARB. We believe that our proposed emission standards would allow the continued advancement of four-stroke technology and are a good compromise between available emission-control technology, cost, and vehicle performance.

We are proposing exhaust emission standards for off-highway motorcycles and ATVs to take effect in the 2006 model year. We would allow a short phase-in of 50-percent implementation in the 2006 model year with full implementation in 2007. These standards apply to testing with the highway motorcycle Federal Test Procedure (FTP) test cycle. For $HC+NO_X$ emissions, the standard is 2.0 g/km (3.2 g/mi). For CO emissions, the standard is 25.0 g/km (40.5 g/mi). These emission standards would allow us to set near-term requirements to introduce the low-emission technologies for substantial emission reductions with minimal lead time. We expect manufacturers to meet these standards using four-stroke engines with some low-level modifications to fuel-system calibrations. These systems would be similar to those used for many years in highway applications, but not necessarily with the same degree of sophistication.

We considered proposing several alternative sets of standards. The first alternative considered was to set the $HC+NO_X$ standard at a level higher than 2.0 g/km, since this standard could prove to be difficult for a two-stroke engine to achieve. However, since two-stroke engines emit so much higher levels of HC than four-stroke engines, and HC emission-control technology for two-stroke engines is more expensive and complicated, we would expect that such a standard would have to be considerably higher than 2.0 g/km, perhaps in the range of 10 to12 g/km. Even a standard this high would still likely require secondary air injection and a catalytic converter for most two-stroke engines to comply. We believe that the concerns over high catalyst temperatures and potential negative impacts on engine performance would most likely result in manufacturers choosing to convert two-stroke applications to four-stroke, especially since four-stroke engines are already so prevalent in off-highway motorcycle and ATV applications. In addition, we believe that the cost differential between air injection and a catalyst for a two-stroke engine and using a four-stroke engine would be minimal. We request comment on such a standard, and on the costs and emissions benefits associated with that approach. Commenters should include a recommendation for the level of the standard.

We also considered setting the $HC+NO_X$ standard at a level lower than 2.0 g/km, since it is possible to use a catalyst on a four-stroke engine and achieve lower emission levels. We decided that for off-highway motorcycles, the technologies necessary to meet emission standards lower than our proposed level of 2.0 g/km for $HC+NO_X$ could be prohibitive due to several factors such as limited catalyst locations that are considered safe to the operator and potential negative engine performance impacts (see our discussion on proposed 2009 standards for more detail). These issues are not as important for ATVs. However, it would be difficult to implement them by the 2006 model year since 20 percent of the fleet is still two-stroke and manufacturers would need time to convert their fleet to four-stroke. Therefore, we are not proposing a $HC+NO_X$ standard lower than 2.0 g/km for off-highway motorcycles and are instead proposing a second phase of standards for ATVs in the 2009 model year. We are asking for comment on this aspect of the proposal, and on such a standard.

Some youth-oriented off-highway motorcycles and ATVs with small engine displacements have engine governors limiting vehicle speeds. In the case of ATVs, the Consumer Product Safety Commission (CPSC) limit youth ATVs with engine displacements between 50 and 100 cc to a top speed of 35 mph. Similarly, ATVs with engine displacements of 50 cc and less are limited to a top speed of 15 mph. Many small off-highway motorcycles use the same governors. For vehicles with a displacement greater than 50 cc, we believe the FTP is an appropriate test cycle because of the transient capability of these vehicles. However, for the vehicles with engine displacements of 50 cc and less, the governed top speed of 15 mph restricts the operation of these vehicles to either idle or the governed wide-open throttle setting, similar to a lawn mowers. It may not make sense to require these small-displacement vehicles to be tested over

the FTP. Therefore, we propose that off-highway motorcycles and ATVs with an engine displacement of 50 cc or less have the option to certify to the proposed off-highway motorcycle and ATV standards discussed above or to meet the Phase 1 Small SI emission standards for non-handheld Class I engines. We request comment on this option.

ATV manufacturers have requested that we allow them the option of certifying ATVs to the same optional exhaust emission standards as allowed by California ARB. California allows ATVs to be optionally tested using the California ARB utility engine test cycle (SAE J1088) and procedures. In California, manufacturers may use the J1088 engine test cycle to meet the California Small Off-Road Engine emission standards. Manufacturers were required to submit some emission data from the various modes of the J1088 test cycles to show that emissions from these modes were comparable to FTP emissions. California allowed this option because the goal of their program was to encourage the use of four-stroke engine technology in ATVs. The lawn and garden test cycle and standards were considered stringent enough to encourage manufacturers to switch from two-stroke engines to four-stroke engines. We continue to be concerned that the J1088 test cycle doesn't represent actual ATV operation, but for our Phase 1 standards, our goal is to encourage manufacturers to switch from two-stroke to four-stroke engine technology. Therefore, to facilitate this phase-in we are proposing here that manufacturers may optionally certify ATVs using the California utility cycle and standards as shown in Table VI.C–1 instead of the FTP standards of 2.0 g/km $HC+NO_X$ and 25 g/km CO discussed above.

TABLE VI.C–1.—CALIFORNIA UTILITY ENGINE EMISSION STANDARDS

Engine displacement	$HC+NO_X$	CO
Less than 225 cc	12.0 g/hp-hr (16.1 g/kW-hr)	300 g/hp-hr (400 g/kW-hr)
Greater than 225 cc	10.0 g/hp-hr (13.4 g/kW-hr)	300 g/hp-hr (400 g/kW-hr)

Some manufacturers have expressed concern about the stringency of the proposed standards for some small displacement (e.g., less than 80 cc) youth off-highway motorcycles and ATVs. They have also stated that some of these small vehicles may have a difficult time operating over the FTP cycle. Therefore, we request comment on the ability of small displacement youth off-highway motorcycles and ATVs to operate over the FTP test cycle and meet our proposed emission standards.

2009 Standards. As stated above, we expect manufacturers to meet the proposed 2006 standards by using four-stroke engines with minor modifications to fuel calibrations. Several technologies are available to further reduce emissions from off-highway motorcycles and ATVs. The most likely choices would be the use of electronic fuel injection, secondary air injection into the exhaust system, and catalytic converters. Although these technologies would be capable of further emission reductions, there are potential concerns with applying each of these technologies to off-highway motorcycles. The complexity and increased cost of electronic fuel injection makes it problematic for off-highway motorcycle applications. Off-highway motorcycle manufacturers and enthusiasts have expressed concern over possible leg burns resulting from catalysts since off-highway motorcycles have exhaust systems that run higher up on the frame. They are concerned that if a rider were to fall over with the motorcycle on top of them, the hot catalyst could burn the rider. Catalysts and secondary air also have the potential to adversely affect engine performance. Since motorcycle performance is paramount for off-highway motorcycles, any technologies that could impact performance or pose a perceived safety threat could encourage consumers to purchase high-performance competition motorcycles rather than recreational motorcycles. For ATVs, however, the design of the vehicle is more receptive to placing a catalyst on the exhaust. Since the engine is further inside the vehicle with numerous plastic fairings around the engine, the operator's legs are far away and shielded from the exhaust pipe. ATV engines also tend to have lower power output than off-highway motorcycle engines, making the use of secondary air or catalysts more tolerable.

Since ATV design and use are more conducive to these more advanced emission-control technologies than off-highway motorcycles, we believe it is appropriate to pursue more advanced emission-control technologies for ATVs. We also note that the usage rate and population of ATVs is growing substantially compared to off-highway motorcycles. We expect that, with additional time to optimize designs to better control emissions, manufacturers of ATVs should be able to meet more stringent emission standards. Starting with the 2009 model year for ATVs only, we propose to apply emission standards of 1.0 g/km (1.6 g/mi) for $HC+NO_X$ emissions and 25 g/km (40.5 g/mi) for CO emissions. As with the Phase 1 standards, we are proposing a two-year phase-in, with 50 percent of models complying in 2009 and all models complying in 2010.

We are proposing that ATVs would be required to meet a 1.0 g/km $HC+NO_X$ standard because we believe it can be met by using four-stroke engines with secondary air injection. Secondary air injection is a common HC emission-control technology used on highway motorcycles. It's use is more transparent to the ATV operator than a catalyst and is a relatively inexpensive means of achieving significant emission reductions. Depending on several variables, some models may have a more difficult time meeting the Phase 2 standards without the use of a catalyst. Therefore, while we expect ATV manufacturers to meet the Phase 2 standards for many of their models using four-stroke engines with air injection, they may also choose to use a combination of several possible emission-control technologies, including base-engine modifications, improved fuel-system calibrations, electronic fuel injection, and catalytic converters. Off-highway motorcycles would continue to meet the 2006 standards described above.

Several ATV manufacturers have expressed concern over being able to meet tighter $HC+NO_X$ standards while still meeting the proposed CO standards. They have asked us to increase or even eliminate the CO standard for Phase 2. Therefore, we request comment on whether the CO standard for Phase 2 should be increased from the proposed level of 25 g/km.

We are proposing to discontinue the provision allowing manufacturers of ATVs the option to certify to the California utility engine test procedure and emission standards for Phase 2 ATVs. We propose to require that manufacturers test all Phase 2 ATVs with the highway motorcycle FTP test procedure. Manufacturers have expressed concerns over the cost of building emission test cells equipped with chassis dynamometers and the representativeness of the FTP relative to in-use ATV operation. They argue that the FTP is no more representative of ATV operation than the steady-state J1088 engine test cycle. While it may be true that the chassis-based FTP test cycle is not fully representative of in-use ATV operation, there is currently very limited data addressing this. California is in the process of gathering in-use operating data for ATVs. Preliminary examination of that data is too inconclusive to determine whether the FTP is adequately representative of in-use ATV operation. It does indicate that the five steady-state modes captured in the J1088 cycle are not adequately representative of ATV operation. It has long been known that ATVs experience considerable transient operation, similar to automobiles and motorcycles. The California data support this view. The chassis-based FTP used for certification of motorcycles, while possibly not ideal for ATVs, therefore appears to be more representative of ATV operation than the J1088 test cycle. With this in mind, we request comment on the possibility of developing an alternate test cycle and procedure for ATVs that would be more representative of typical ATV operation. An alternate test cycle could be chassis-based or engine-based, but would need to incorporate transient operation. If an acceptable alternative cycle is developed, we would reassess whether our proposed emission test procedure for Phase 2 would still be appropriate.

As with the 2006 proposed emission standards, we request comment on the ability of small-displacement ATVs to operate over the FTP test cycle and meet our proposed emission standards.

We request comment on whether a Phase 2 standard for ATVs is appropriate, and on the proposed level of the Phase 2 standard. We also request comment on technology, cost, and safety issues associated with a possible second phase of off-highway motorcycle emission standards.

b. Snowmobiles. We are proposing CO and HC standards for snowmobiles. We are requesting comment on whether we should set standards for PM and NO_X emissions from snowmobiles, and what appropriate levels would be. As previously discussed, snowmobile engines are almost exclusively two-stroke. As such, they emit high levels of HC and PM. However, we are not proposing PM standards at this time for snowmobiles, because limits on HC emissions will serve to simultaneously limit PM. We considered adding a regulatory requirement for manufacturers to measure and report PM emission rates along with their other certification data, but we did not include such a requirement in the proposed regulations. We are most concerned about the cost to manufacturers if they were required to build PM measurement capabilities into all of their test facilities. We request comment on the need for PM emission data, and whether it is necessary to put a requirement in the regulations.

We are not proposing NO_X standards for snowmobiles because they are primarily operated during the winter months when ozone is not a concern. However, we are proposing that manufacturers measure NO_X emission rates and report them in their applications for certification. We believe that this would provide necessary information, but would not be a significant burden for manufacturers. We request comment on this element of the proposal.

2006 Standards. We are proposing standards for snowmobiles to take effect for all models starting in the 2006 model year: 275 g/kW-hr (205 g/hp-hr) for CO and 100 g/kW-hr (75 g/hp-hr) for HC. As discussed below, we are proposing an emission-credit program with these standards. Thus, we expect manufacturers to meet these proposed standards using a variety of technologies and strategies across their product lines. Snowmobiles pose some unique problems for implementing emission-control technologies and strategies. Snowmobiles are very sensitive to weight, power, and packaging constraints. Current snowmobile designs have very high power-to-weight ratios, allowing for excellent performance. Manufacturers have stated that if snowmobile performance declines, customers will either stop purchasing snowmobiles, or will replace original equipment (e.g., emission-control technology) with uncertified aftermarket parts. The desire for low weight is perceived as a safety issue, since operators may have to drag their sleds out of deep snow. Styling, especially very low-profile hoods, has also become paramount among snowmobile enthusiasts. All these concerns mean that it may be initially more difficult for manufacturers to develop a broad range of technologies capable of significant emission reductions. Some manufacturers may aggressively pursue clean carburetion and associated engine modifications and apply those uniformly across their entire product line. Others may choose to apply more advanced technologies such as direct or semi-direct injection to some of their more expensive, high-performance sleds and be less aggressive in pursuing emission reductions from their lower-priced offerings in order to optimize the fit of different technologies (and their associated costs) to the various product offerings. We also expect some manufacturers to offer some models featuring four-stroke engines.

We are proposing to require all snowmobiles to meet the proposed first phase of emission standards beginning with the 2006 model year. We request comment on options to ease the transition to the new standards, as described in Section VI.C.2.b.

Due to the unique performance requirements for snowmobiles, we believe our proposed 2006 standards would be challenging for manufacturers and would result in cleaner snowmobiles. While some advanced technologies such as two-stroke direct injection and four-stroke engines, would be found in some models, many models would still be equipped with two-stroke engines with relatively minor engine modifications resulting in minimum emission reductions, while some models may not even have any emission controls.

2010 Standards. We have had many discussions with manufacturers about emission control technologies. We have also closely examined the certification emission results of outboard boat engines and personal watercraft (PWC) equipped with two-stroke direct injection and four-stroke engines. It is our belief that with sufficient lead time, manufacturers can successfully implement these technologies across a much broader range of their snowmobile fleet. Manufacturers have indicated to us that two-stroke engines equipped with direct fuel injection systems could reduce HC emissions by 70 to 75 percent and reduce CO emissions by 50 to 60 percent. Certification results for 1999 and 2000 model year outboard engines and PWC support the manufacturers projections. In addition, two snowmobile manufacturers plan to sell a four-stroke model next year. These manufacturers indicated that their machines are capable of HC reductions in the 70 to 95 percent range, with CO reductions of 60 to 80 percent. Therefore, we believe that with

sufficient time it is feasible for snowmobile manufacturers to achieve a greater penetration of advanced emission control technologies throughout their fleets and reduce emissions further.

We are, therefore, proposing a second phase of average standards to take effect with the 2010 model year. The proposed 2010 average standards are 200 g/kW-hr (149 g/hp-hr) for CO and 75 g/kW-hr (56 g/hp-hr) for HC. These standards represent a 50% reduction in HC and CO emissions from the current average baseline levels. We believe that implementation in 2010 would provide sufficient time for advanced technologies to be more broadly available. We also believe that manufacturers will have had adequate time to make appropriate modifications to snowmobile designs (e.g., styling and packaging issues) so they can more broadly spread advanced emission-control technologies across their product lines. We expect these standards would be met through the application of direct injection two-stroke technology and, to a much lesser extent, four-stroke technology, to cover about half of overall production, with the remaining models utilizing clean carburetion and electronic fuel injection, along with the associated engine modifications. The actual mix of technologies used would be the manufacturers choice, but the data mentioned above gives us reason to believe that the basic technology exists to meet the standard based on a 50-percent reduction. We believe that the lead time provided to meet these standards is sufficient to overcome the technical hurdles discussed below in Section VI.F.2.

We request comment on our second phase of snowmobile standards. In particular, we are interested in comments on the level of the standards, our technical assessment and potential fleet mix projections, any safety, reliability, or performance considerations associated with adoption of four-stroke technology. We also request comment on the cost of adopting such standards and the effects on sales and consumer satisfaction. We are also interested in further information addressing the benefits associated with such a standard.

c. Noise Standards. The Noise Control Act (42 U.S.C. 4901 *et seq.*) authorizes EPA to establish noise emission standards for motorized equipment. Under this authority, we established noise emission standards for motorcycles and three-wheeled ATVs in 40 CFR Part 205 (45 FR 86708, December 31, 1980). These regulations include voluntary ''Low noise emission product standards'' for motorcycles § CFR 205.152(c)).

Prior to proposal, we received public comments requesting that we consider setting new noise standards for recreational vehicles. Noise from these vehicles in public parks or other public lands can adversely impact other activities. However, at this time we do not have funding to pursue noise standards for nonroad equipment that does not have an existing noise requirement.

2. Are There Opportunities for Averaging, Emission Credits, or Other Flexibilities?

a. Averaging, Banking and Trading. Historically, voluntary emission-credit programs have allowed a manufacturer to certify one or more engine families at emission levels above the applicable emission standards, provided that the increased emissions are offset by one or more engine families certified below the applicable standards. With averaging alone, the average of all emissions for a particular manufacturer's production must be at or below that level of the applicable emission standards. We are proposing separate emission-credit programs for snowmobiles, off-highway motorcycles, and ATVs. We are proposing an emissions credit program for the optional Phase 1 ATV engine-based standards as well as the chassis-based standards. We request comment on whether or not averaging, banking, and trading adds value to the engine-based option considering the level of the standards being proposed.

In addition to the averaging program just described, the proposed emission-credit program contains banking and trading provisions, which allow manufacturers to generate emission credits and bank them for future use in their own averaging program or sell them to another entity. We are not proposing a credit life limit or credit discounting for these credits. Unlimited credit life and no discounting increases the incentive to introduce the clean technologies needed to gain credits. In order to generate credits, the average emissions level must be below the standard, so the credits would be the result of reductions in excess of those required by the standards.

We are seeking comment on whether or not a credit life limit (e.g., three years) is needed to ensure that manufacturers do not have the opportunity to, in effect, postpone the Phase 2 standards for several years for one or more vehicle families. Unlimited credit life has the potential to interfere with the timely and orderly phase-in of future standards, especially if the manufacturer is able to bank large amounts of credits during intervening years. This is a concern here because the proposed level of the Phase 1 standards may provide considerable opportunity for credit generation for manufacturers that can market a significant number of relatively clean models early in the program. For example, some 4-stroke ATV models are likely to have emissions levels below the Phase 1 standards, allowing for considerable credit generation.

We also request comment on how this issue may differ for credits generated under Phase 2, where the affect on the next tier of standard is not a complicating issue. We would have the opportunity to consider and reassess such a provision if and when we were to propose a third phase of standards. In addition, we request comments on an alternative approach of not allowing credits generated in Phase 1 to be used in Phase 2.

For off-highway motorcycles and ATVs, we are proposing to allow averaging for the HC plus NO_X standard. Off-highway motorcycle and ATVs would be averaged separately to avoid providing an advantage in the market to companies that offer both types of products over those that produce only one type. In addition, there are differing degrees of stringency in the standards for ATVs and off-road motorcycles long-term and we do not want off-road motorcycle credits to dilute the effectiveness of the Phase 2 ATV standards. Also, ATVs certified to the chassis-based standards and engine-based standards would be considered separate averaging groups with no credit exchanges between the two. We are not allowing credit exchanges between engine and chassis-based testing because there is little, if any, correlation between the two test cycles. Without a strong correlation, it is not possible to establish an exchange rate between the two programs. We are not proposing a CO averaging, banking, and trading program because the level of the standard does not appear to add substantial technological challenge to the program, especially for Phase 1. The usefulness of CO averaging may not warrant the additional complexity of an averaging program. We request comment on the need for a CO ABT program for Phase 2, and on the proposed approach for separate ABT programs.

For the Phase 2 ATV standards, we are proposing a maximum allowable Family Emission Limit (FEL) of 2.0 g/km HC plus NO_X (the Phase 1 standard). In several other ABT programs, we have

established a cap at the previous emission standard to ensure a minimum level of control long term. We request comment on whether or not an FEL limit is appropriate to ensure a minimum level of control for all models. Please see the discussion on this issue in the recreational marine diesel section of this document for more information. We request comment specifically on how this approach could affect product offerings and consumer choice. We also request comment on the level of the emissions cap and alternative levels.

For snowmobiles, we are proposing an emission-credit program for both CO and HC. We are proposing that maximum allowable Family Emission Limits be set at the current average baseline emission levels of 400 g/kW-hr (300 g/hp-hr) CO and 150 g/kW-hr (110 g/hp-hr) HC. This cap ensure a minimum level of control for each snowmobile certified under the program. We believe that this is appropriate due to the potential for personal exposure to very high levels of emissions as well as the potential for high levels of emissions in areas where several snowmobiles are operated in a group. We request comment on the level of the cap for Phase 1. We also request comment on whether it would be appropriate to set more stringent maximum allowable Family Emission Limits for 2010 and later model year snowmobiles, for example, at the levels of the 2006 standards. We are interested in comment on any potential impacts a more stringent cap may have on the variety of products available to the consumer. We are proposing that manufacturers may not both generate and use credits for the different pollutants within a given engine family.

We request comment on all aspect of the proposed ABT program, including on the administrative and liability provisions provided in the proposed regulatory text.

b. Early Credits and Alternative Phase-in Schedule. We are interested in but are not specifically proposing opportunities for early credits, and other flexibilities, as discussed below. We are proposing no phase-in schedule for snowmobiles and a two-year phase-in schedule for off-road motorcycles and ATVs. While we believe adequate lead-time is provided to meet the proposed standards, we recognize that some flexibility in timing could help manufacturers transition their full product line to new standards. We are requesting comment on three specific approaches to providing additional flexibility to manufacturers, described below. We are interested in how these provisions could be established in a way that would be environmentally neutral and yet also provide manufacturers with flexibility.

We are not proposing provisions for early generation of credits, because we have not been able to resolve our concerns about substantial windfall credits (credits generated relatively easily from baseline engines). For example, there could be substantial credits available for snowmobile manufacturers that have developed four-stroke snowmobile models. Also, some baseline ATV and off-highway motorcycles could also have relatively low emission levels. However, as discussed below, we are seeking comment on approaches for early credits that could address concerns regarding windfall credits.

Under an early emission-credit approach, manufacturers could earn credits by reducing emissions earlier than required, then use those credits after the program begins. Because there is a wide variation in baseline emission levels, we would need to consider taking steps to ensure that manufacturers do not generate windfall credits. One way to address the concern for windfall credits would be to allow credits only for emission reductions below the proposed standards and limit the life of those credits to three years. We believe this approach may ensure that manufacturers would generate credits only through the use of cleaner technologies. It also ensures that the credits would not adversely impact the long-term effectiveness of the program. This approach would provide incentive for manufacturers to pull ahead significantly cleaner technologies. We request comment on early credits for CO and HC emissions for snowmobiles and $HC+NO_X$ emissions for off-road motorcycles and ATVs, and a requirement that the credit-generating engines also meet the standards for the other regulated pollutants.

Under the second approach, an alternative phase-in schedule, manufacturers would be provided with a one-for-one credit in the phase-in schedule for selling complying recreational vehicles prior to the start of the program. Manufacturers who pull ahead a percentage of their product line would get a phase-in credit to be used during the initial years of the program (i.e., 2008 and earlier). For example, if a snowmobile manufacturer phased in 10 percent of their product line early in 2005, they could then phase-in 90 percent, rather than 100 percent, of their product line in 2006. We would expect this to be a transitional provision limited to the first few years of the program (all vehicles would need to be certified by 2008). We could implement the program through a calculation based on the sum of the phase-in percentages over a series of model years. For example, for snowmobiles, the sum of the phase-in percentages over model years 2004–2008 could be required to be equal to or greater than 300% (100% each for 2006, 2007, and 2008). For off-road motorcycles and ATVs, the calculation would take into account the 50/100 percent phase-in schedule for 2006/2007, with a requirement that the sum of the phase-in be equal to or greater than 250 percent. For example, an alternative phase-in schedule of 25/50/75/100 percent in 2005 through 2008 would be acceptable. The calculation of the percentage phase-in would be the same as that for the standard program.

An alternative to early banking or a revised phase-in would be ''family-banking.'' Under the ''family-banking'' concept, we would allow manufacturers to certify an engine family early. For each year of certifying an engine family early, the manufacturer would be able to delay certification of a smaller engine family by one year. This would be based on the actual sales of the early family and the projected sales volumes of the late family; this would require no calculation or accounting of emission credits.

We request comment on the above approaches or any other approach that would help manufacturers bring the product lines into compliance to the proposed standards without compromising emissions reductions (see § 1048.145 of the proposed regulations). We request comment on the merits of the various approaches noted above, and others commenter may wish to suggest. We request that commenters provide detailed comments on how the approaches should be set up, enhanced, or constrained to ensure that they serve their purpose without diminishing the overall effectiveness of the standards.

3. Is EPA Proposing Voluntary Low-Emission Standards for These Engines?

We are proposing a Voluntary Low-Emission Standards program for recreational vehicles. The purpose of this program is two-fold; first, to encourage new emission-control technology and second, to aid the consumer in choosing clean technologies. At the point of purchase, manufacturers could add a tag designating qualifying vehicles to inform consumers which engines are certified by this program and listing the certification levels of the vehicles. In addition, we are suggesting that manufacturers provide information about the program in the vehicle

Owner's Manual. To qualify for this program, engines must meet the voluntary standards described below. Manufacturers choosing to sell engines with this designation may generate certification emission credits from these technologies.

The general purpose of the Voluntary Low-Emission Standards program is to provide incentives to manufacturers to produce clean products and thus create market choices for consumers to purchase these products.[154] We believe that EPA designation of clean technologies through this voluntary program can provide useful information to consumers. We request comment on the merits and design of the program and also on additional measures we can take to encourage this program and prohibit misuse.

We are proposing Voluntary Low-Emission Standards for off-highway motorcycles and ATVs of 0.8 g/km (1.3 g/mi) HC+NO_X and 12 g/km (24.3 g/mi) CO. These emission levels are consistent with the 2008 standards proposed by California ARB for highway motorcycles. We believe that off-highway motorcycles and ATVs could meet these voluntary standards by employing some of the same technologies manufacturers will use to meet the 2008 California emission standards for highway motorcycles. We request comment on the level of the standards and the need for lower voluntary standards for Phase 2 of the ATV program.

We are proposing Voluntary Low Emission Standards for snowmobiles of 200 g/kW-hr (149 g/hp-hr) for CO and 75 g/kW-hr (56 g/hp-hr) for HC through 2009 model year snowmobiles. These are the same levels as our proposed phase 2 standards. For the 2010 model year and later, the standards are 120 g/kW-hr (89 g/hp-hr) for CO and 45 g/kW-hr (34 g/hp-hr) for HC for any snowmobiles. We believe these voluntary standards could be met with either direct injection two-stroke, or four-stroke technology. Snowmobiles included in this program may generate credits for use in the proposed emission-credit program. We request comment on the level of the voluntary standards being proposed and whether we should consider more or less stringent voluntary standards for snowmobiles.

[154] The snowmobile industry (see docket item II–G–221) and a group of public health and environmental organizations (see docket item II–G–139) have both expressed their general support for labeling programs that can provide information on the environmental performance of various products to consumers.

4. What Durability Provisions Apply?

We are proposing several additional provisions to ensure that emission controls would be effective throughout the life of the vehicle. This section discusses these proposed provisions for recreational vehicles. More general certification and compliance provision, which would apply across the different vehicle categories in this proposal, are discussed in Sections III and VII, respectively.

a. How long would my engine have to comply? We propose to require manufacturers to produce off-highway motorcycle and ATV engines that comply over their full useful life, where useful life is the period that lasts either 5 years or until the vehicle accumulates 30,000 kilometers, whichever occurs first. We would consider this 30,000-kilometer value to be a minimum kilometer value for useful life, and would require manufacturers to comply for a longer period in those cases where they design their vehicles to be operated longer than 30,000 kilometers.

For snowmobiles, we are proposing a minimum useful life of 5 years or 300 hours of operation, whichever occurs first. We based these values on discussions with manufacturers regarding typical snowmobile life, and on emission-modeling data regarding typical snowmobile usage rates.[155]

We request comment on the proposed useful life values. Any comments in support of a different useful life should include documentation of typical life and operation.

b. Would I have to warrant my engine's emission controls? We are proposing a design/defect warranty period of 3 years, with an hours or kilometers limit equal to half the useful life interval proposed above. During this time manufacturers would repair or replace free of charge emission-related components that fail. Because this warranty requirement applies only for emission-related components, manufacturers are not responsible for routine maintenance that is currently performed for uncontrolled engines (e.g., changing oil filters or carburetors).

c. How would I demonstrate emission durability during certification? For off-highway motorcycles and ATVs, we are proposing the same durability demonstration requirements that apply to highway motorcycles. This includes a requirement to run the engines long enough to test for exhaust emissions at the end of the useful life. This allows manufacturers to generate a deterioration factor that helps ensure that the engines will continue to control emissions over a lifetime of operation.

d. What maintenance would be allowed during service accumulation? For vehicles certified to the proposed useful life, no emission-related maintenance would be allowed during service accumulation. The only maintenance that would be allowed is regularly scheduled maintenance unrelated to emissions that is technologically necessary. This could typically include changing engine oil, oil filter, fuel filter, and air filter.

5. Do These Standards Apply to Alternative-Fueled Engines?

These proposed standards apply to all spark-ignited recreational vehicles, without regard to the type of fuel used. However, because we are not aware of any alternative-fueled recreational vehicles sold into the U.S. market, we are not proposing extensive special provisions to address them at this time.

6. Is EPA Controlling Crankcase Emissions?

We are proposing to require that new off-highway motorcycles and ATVs be built to prevent crankcase emissions. This means that engines would no longer emit crankcase vapors directly to the atmosphere. The typical control strategy is to route the crankcase vapors back to the engine intake. This proposal is consistent with our previous regulation of crankcase emissions from such diverse sources as highway motorcycles, outboard and personal watercraft marine engines, locomotives, and passenger cars. We have data from California ARB showing that a performance-based four-stroke off-highway motorcycle experienced considerably higher tailpipe emission results when crankcase emissions were routed back into the intake of the engine, illustrating the potentially high levels of crankcase emissions that exist.[156] We are also proposing closed crankcases on new snowmobiles. This requirement is only relevant for four-stroke snowmobiles, however, since two-stroke engines, by virtue of their operation, have closed crankcases. Information on the costs and benefits of this action can be found in the Draft Regulatory Support Document.

D. Proposed Testing Requirements

1. What Duty Cycles Are Used To Measure Emissions?

Testing a vehicle or engine for emissions consists of exercising it over

[155] EPA memorandum, ''Emission Modeling for Recreational Vehicles,'' from Linc Wehrly to Docket A–98–01, November 13, 2000.

[156] Memo to Docket from Linc Wehrly, dated September 10, 2001. (A–2000–1) document II–B–25.

a prescribed duty cycle of speeds and loads, typically using a chassis or engine dynamometer. The nature of the duty cycle used for determining compliance with emission standards during the certification process is critical in evaluating the likely emission performance of engines designed to those standards. Duty cycles must be relatively comparable to the way equipment is actually used because if they are not, then compliance with emission standards would not assure that emissions from the equipment are actually being reduced in use as intended.

a. Off-highway Motorcycles and ATVs. For off-highway motorcycles and ATVs, we propose that the current highway motorcycle test procedure be used for measuring emissions. The highway motorcycle test procedure is the same test procedure as used for light-duty vehicles (i.e., passenger cars and trucks) and is referred to as the Federal Test Procedure (FTP). The FTP for a particular class of engine or equipment is actually the aggregate of all of the emission tests that the engine or equipment must meet to be certified. However, the term FTP has also been used traditionally to refer to the exhaust emission test based on the Urban Dynamometer Driving Schedule (UDDS), also referred to as the LA4 (Los Angeles Driving Cycle #4). The UDDS is a chassis dynamometer driving cycle that consists of numerous ''hills'' which represent a driving event. Each hill includes accelerations, steady-state operation, and decelerations. There is an idle between each hill. The FTP consists of a cold start UDDS, a 10 minute soak, and a hot start. The emissions from these three separate events are collected into three unique bags. Each bag represents one of the events. Bag 1 represents cold transient operation, bag 2 represents cold stabilized operation, and bag 3 represents hot transient operation.

Highway motorcycles are divided into three classes based on engine displacement, with Class I (50 to 169 cc) being the smallest and Class III (280 cc and over) being the largest. The highway motorcycle regulations allow Class I motorcycles to be tested on a less severe UDDS cycle than the Class II and III motorcycles. This is accomplished by reducing the acceleration and deceleration rates on some of the more aggressive ''hills.'' We propose that this same class/cycle distinction be allowed for off-highway motorcycles and ATVs. In other words, off-highway motorcycles and ATVs with an engine displacement between at or below 169 cc would be tested over the FTP test cycle for Class I highway motorcycles. Off-highway motorcycles and ATVs with engine displacements greater than 169 cc would be tested over the FTP test cycle for Class II and Class III highway motorcycles. Some manufacturers have expressed concern over the ability of some small-displacement (e.g., less than 80 cc) youth off-highway motorcycles and ATVs to operate over the FTP. We request comment on the ability of these small-displacement vehicles to operate over the FTP test cycle. We also request comment on whether or not it would be appropriate to allow all ATVs to be certified using the Class I cycle.

Some manufacturers have noted that they do not currently have chassis-based test facilities capable of testing ATVs. Manufacturers have noted that requiring chassis-based testing for ATVs would require them to invest in additional testing facilities that can handle ATVs, since ATVs do not fit on the same roller(s) as motorcycles used in chassis testing. Some manufacturers also have stated that low-pressure tires on ATVs would not stand up to the rigors of a chassis dynamometer test. California provides manufacturers with the option of certifying ATVs using the engine-based, utility engine test procedure (SAE J1088), and most manufacturers use this option for certifying their ATVs. Manufacturers have facilities to chassis-test motorcycles and therefore California does not provide an engine-testing certification option for motorcycles.

We have tested numerous ATVs over the FTP and have found that several methods can be used to test ATVs on chassis dynamometers. The most practical method for testing an ATV on a motorcycle dynamometer is to disconnect one of the drive wheels and test with only one drive wheel in contact with the dynamometer. For chassis dynamometers set up to test light-duty vehicles, wheel spacers or a wide axle can be utilized to make sure the drive wheels fit the width of the dynamometer. We have found that the low-pressure tires have withstood dynamometer testing without any problems.

We acknowledge that a chassis dynamometer could be very costly to purchase and difficult to put in place in the short run, especially for smaller manufacturers. Therefore, we are proposing that for the model years 2006 through 2009, ATV manufacturers would be allowed the option to certify using the J1088 engine test cycle per the California off-highway motorcycle and ATV program. After 2009, this option would end and the FTP would be the required test cycle. If an alternate transient test cycle (engine or chassis) correlates with the FTP or better represents in-use ATV operation, we would consider allowing manufacturers to use the alternative test cycle in place of the FTP.

b. Snowmobiles. We are proposing to adopt the snowmobile duty cycle developed by Southwest Research Institute (SwRI) in cooperation with the International Snowmobile Manufacturers Association (ISMA) for all snowmobile emission testing.[157] The test procedure consists of two main parts; the duty cycle that the snowmobile engine would operate over during testing and other testing protocols surrounding the measurement of emissions (sampling and analytical equipment, specification of test fuel, atmospheric conditions for testing, etc.). While the duty cycle we are proposing was developed specifically to reflect snowmobile operation, many of the testing protocols are well established in other EPA emission-control programs and have been simply adapted where appropriate for snowmobiles.

The snowmobile duty cycle was developed by instrumenting several snowmobiles and operating them in the field in a variety of typical riding styles, including aggressive (trail), moderate (trail), double (trail with operator and one passenger), freestyle (off-trail), and lake driving. A statistical analysis of the collected data produced the five mode steady-state test cycle is shown in Table VI.D–1.

TABLE VI.D–1.—PROPOSED SNOWMOBILE ENGINE TEST CYCLE

Mode	1	2	3	4	5
Normalized Speed	1	0.85	0.75	0.65	Idle
Normalized Torque	1	0.51	0.33	0.19	0

[157] ''Development and Validation of a Snowmobile Engine Emission Test Procedure,'' Jeff J. White, Southwest Research Institute and Christopher W. Wright, Arctic Cat, Inc., Society of Automotive Engineers paper 982017, September, 1998. (A–2000–1) document II–D–05.

TABLE VI.D–1.—PROPOSED SNOWMOBILE ENGINE TEST CYCLE—Continued

Mode	1	2	3	4	5
Relative Weighting (%)	12	27	25	31	5

We believe this duty cycle is representative of typical snowmobile operation and is therefore appropriate for demonstrating compliance with the proposed snowmobile emission standards. We request comment on this proposed duty cycle, and on any alternatives that we should consider.

The other proposed testing protocols are largely derived from our regulations for marine outboard and personal watercraft engines, as recommended in the SwRI/ISMA test cycle development work (61 FR 52088, October 4, 1996). The testing equipment and procedures from that regulation are generally appropriate for snowmobiles. Unlike snowmobiles, however, the marine engines tend to operate in fairly warm ambient temperatures. Thus, some provision needs to be made in the snowmobile test procedure to account for the colder ambient temperatures typical of snowmobile operation. Since snowmobile carburetors are jetted for specific ambient temperatures and pressures, we could take one of two general approaches. The first is to require testing at ambient temperatures typical of snowmobile operation, with appropriate jetting. A variation of this option is to simply require that the engine inlet air temperature be representative of typical snowmobile operation, without requiring that the entire test cell be at that temperature. The second is to allow testing at higher temperatures than typically experienced during snowmobile operation, with jetting appropriate to the warmer ambient temperatures.

We are proposing that snowmobile engine inlet air temperature be between −15° C and −5° C (5° F and 23° F), but that the ambient temperature in the test cell not be required to be refrigerated. We believe this approach strikes an appropriate balance between the need to test at conditions that are representative of actual use, and the fact that simply cooling the inlet air would be significantly less costly than requiring a complete cold test cell.

We request comment on whether we should allow snowmobile engine testing to be done according to the test procedures developed by Southwest Research Institute. Under those procedures testing is done at warmer ambient temperatures than typical of snowmobile operation. Appropriate jetting under this approach is determined by extrapolating from the manufacturer's jet chart (if necessary).

We invite comment on all aspects of the proposed test procedures.

2. What Fuels Will Be Used During Emission Testing?

We are proposing to use the same fuel specifications for all recreational vehicles as we currently use for highway motorcycles and light-duty vehicles, which is representative of a summertime blend. We believe that off-highway motorcycles and ATVs use the same fuel as highway motorcycles. While snowmobiles typically operate during wintertime, we believe it is appropriate to use summertime gasoline for testing, primarily because it is the fuel that was used for the snowmobile emission testing that supported the development of our baseline emission estimates. Also, the majority of snowmobile HC emissions are a result of scavenging losses (unburned fuel from the intake charge exiting the combustion chamber with the exhaust gases). The primary difference between summertime and wintertime gasoline blends is the volatility, which is not likely to have a significant effect on scavenging losses. However, given that snowmobiles typically operate during wintertime, we request comment on whether we should consider a unique test fuel specifically for snowmobiles, and what specifications might be appropriate for such a fuel. Also, if we were to consider a unique snowmobile test fuel based on wintertime gasoline properties, should the proposed standards be adjusted in any way to account for the fact that the baseline emission estimates were developed from test data utilizing summertime blends.

3. Are There Production-Line Testing Provisions for These Engines?

We are proposing that recreational vehicle or engine manufacturers perform emission tests on a small percentage of their production as it leaves the assembly line to ensure that production vehicles operate at certified emission levels. The broad outline of this program is discussed in Section III.C.4 above. We are proposing that production-line testing be performed using the same test procedures as for certification testing. We request comment on all aspects of the proposed production-line testing requirements, including engine sampling rates and options for using alternative testing methods.

E. Special Compliance Provisions

As described in Section XI.B, the report of the Small Business Advocacy Review Panel addresses the concerns of small-volume manufacturers of recreational vehicles.

Off-Highway Motorcycles and ATVs

To identify representatives of small businesses for this process, we used the definitions provided by the Small Business Administration for motorcycles, ATVs, and snowmobiles (fewer than 500 employees). Eleven small businesses agreed to serve as small-entity representatives. These companies represented a cross-section of off-highway motorcycle, ATV, and snowmobile manufacturers, as well as importers of off-highway motorcycles and ATVs.

As discussed above, our proposed emission standards for off-highway motorcycles and ATVs will likely necessitate the use of 4-stroke engines. Most small-volume off-highway motorcycle and ATV importers—and to a lesser degree, small-volume manufacturers—currently use 2-stroke engines. While 4-stroke engines are in widespread use in motorcycles and ATVs in general, their adoption by any manufacturer is still a significant business challenge. Small manufacturers of these engines could face additional challenges in certifying engines to emission standards, because the cost of certification would be spread over the relatively few engines they produce. These higher per-unit costs could place small manufacturers at a competitive disadvantage without specific provisions to address this burden.

We are proposing to apply the flexibilities described below to engines produced or imported by small entities with combined off-highway motorcycle and ATV annual sales of fewer than 5,000 units. The SBAR Panel recommended these provisions to address the potentially significant adverse effects on small entities of an emission standard that will likely result in the use of four-stroke engines. The 5,000-unit threshold is intended to focus these flexibilities on those segments of the market where the need

is likely to be greatest and to ensure that the flexibilities do not result in significant adverse environmental effects during the period of additional lead-time recommended below.[158] We request comment on the appropriateness of the 5,000-unit threshold. In addition, we propose to limit use of some or all of these flexibilities to entities that are in existence or have product sales at the time of proposal to avoid creating arbitrary opportunities in the import sector, and to guard against the possibility of corporate reorganization, entry into the market, or other action for the sole purpose of circumventing emission standards. We request comment on any such restrictions.

We also request comment on allowing small entities with sales in excess of 5,000 units to certify using the flexible approaches described below for several engines equal to their 2000 or 2001 sales level. This would assure that all small entities currently in the market would be able to take advantage of these approaches. In addition, we request comment on when small entities must notify EPA that they intend to use the small-entity flexibilities.

During the Panel's outreach meeting with small entities on issues related to recreational ATVs and off-road motorcycles, small entities expressed particular concern that a federal emission standard requiring manufacturers to switch to four-stroke engines might increase costs to the point that many small importers and manufacturers could experience significant adverse effects. As noted above, the Panel recommendations are designed to reduce the burden on small entities without compromising the environmental benefits of the program. However, it is possible that even with the broad flexibility under consideration, costs to small entities may still be too high. Also, they may not be able to recover costs without losing much or all of their business. We seek comment on the effect of the proposed standard on small entities, including any data or related studies to estimate the extent to which sales of their products are likely to be reduced as a result of changes in product price resulting from the proposed standards, more specifically from the conversion of two-stroke technology to four-stroke technology. Additionally, we seek comment on any differences in costs between small and large manufacturers. We plan to assess information received in response to this request to inform the final rule decision-making process on whether additional flexibility (beyond that proposed below) is warranted.

Snowmobiles

There are only a few small snowmobile manufacturers and they sell only a few hundred engines a year, which represents less than 0.5 percent of total annual production. Therefore, the per-unit cost of regulation could be significantly higher for these small entities because they produce very low volumes. Additionally, these companies do not have the design and engineering resources to tackle compliance with emission standard requirements at the same time as large manufacturers and tend to have limited ability to invest the capital necessary to conduct emission testing related to research, development, and certification. Finally, the requirements of the snowmobile program may be infeasible or highly impractical because some small-volume manufacturers may have typically produced engines with unique designs or calibrations to serve niche markets (such as mountain riding). Our proposed snowmobile emission standards could impose significant economic hardship on these few manufacturers whose market presence is small. We therefore believe significant flexibility is necessary and appropriate for this category of small entities, as described below.

Flexibilities

1. Additional Lead Time

We believe additional lead-time would be a way of reducing the burden to meet the proposed standards. This would provide extra time for technology to develop and, in the case of importers, extra time to resolve supplier issues that may arise. We propose a delay of two years beyond the date larger businesses would be required to comply. For ATVs and snowmobiles, the two-year delay would also apply to the timing of the proposed Phase 2 standards.

In addition, for small snowmobile manufacturers, we propose that the emission standards be phased in over an additional two years at a rate of 50 percent, then 100 percent. Phase 1 would be phased in at 50/50/100 percent in 2008/2009/2010 and Phase 2 would be phased in 50/50/100 percent in 2012/2013/2014. We seek comment on whether a longer time period is appropriate given the costs of compliance for small businesses and the relationship between importers and their suppliers.

2. Design-Based Certification

The process of certification is a business cost and lead time issue that may place a disproportionate burden on small entities, particularly importers. Certification is a fixed cost of doing business, which is potentially more burdensome on a unit-cost basis for small entities. It is potentially an even greater challenge, since some small entities will either contract emission testing to other parties or, in the case of importers, perhaps rely on off-shore manufacturers to develop and certify imported engines.

We propose to permit small-volume manufacturers to use design-based certification, which would allow us to issue a certificate to a small business for the emission-performance standard based on a demonstration that engines or vehicles meet design criteria rather than by emission testing. The intent is to demonstrate that an engine using a design similar to or superior than that being used by larger manufacturers to meet the proposed emission standards would ensure compliance with the proposed standards. The demonstration would be based in part on emission test data from engines of a similar design. Under a design-based certification program, a manufacturer would provide evidence in the application for certification that an engine or vehicle would meet the applicable standards for its useful life based on its design (e.g., the use a four-stroke engine, advanced fuel injection, or any other particular technology or calibration). The design criteria could include specifications for engine type, calibrations (spark timing, air/fuel ratio, etc.), and other emission-critical features, including, if appropriate, catalysts (size, efficiency, precious metal loading). Manufacturers would submit adequate engineering and other information about their individual designs showing that they meet emission standards for the useful life. We request comment on how these provisions should be implemented. We also seek comment on whether we should allow large manufacturers to use similar provisions on a limited basis.

3. Broaden Engine Families

We propose an approach that would allow for relaxed criteria for what constitutes an engine or vehicle family. It would allow small businesses to put all their models into one vehicle or engine family (or more) for certification purposes if appropriate. Manufacturers would then certify their engines using the ''worst-case'' configuration within the family.

[158] For example, importers may have access to large supplies of vehicles from major overseas manufacturers and potentially could substantially increase their market share by selling less expensive noncomplying products.

A small manufacturer might need to conduct certification emission testing rather than pursuing design-based certification. Such a manufacturer would likely find broadened engine families useful.

4. Production-Line Testing Waiver

As discussed above, we are proposing to require manufacturers to test a small sampling of production engines to ensure that production engines meet emission standards. We propose to waive production-line testing for small entities and request comment on whether limits for this waiver would be appropriate. This would eliminate or substantially limit production-line testing requirements for small businesses. It could be limited to engine/vehicle families under a given production volume or could be applied broadly to small businesses. This is likely to be important to small businesses, many of which do not have testing facilities on-site and would rely on outside contractors for testing.

5. Use of Assigned Deterioration Factors for Certification

We propose to provide small entities with the option of using assigned deterioration factors. Rather than performing a durability demonstration for each family for certification, manufacturers would elect to use deterioration factors determined by us to demonstrate emission levels at the end of the useful life, thus reducing the development and testing burden. This could be a very useful and cost-beneficial option for a small manufacturer opting to perform certification emission testing instead of design-based certification.

6. Using Emission Standards and Certification From Other EPA Programs

A wide array of engines that have been certified to other EPA programs could be used in recreational vehicles. For example, there is a large variety of engines certified to EPA lawn and garden standards (Small SI). We propose to allow manufacturers of recreational vehicles to use engines certified to any other EPA standards for five years. Under this approach, engines certified to the Small SI standards could be used in recreational vehicles, and such engines would be subject to the Small SI standards and related provisions rather than the Recreational Vehicle program. The small business using the engine would not have to recertify the engine, provided the manufacturer does not alter the engine in such a way as to cause it to exceed the emission standards it was originally certified as meeting. Also, the recreational vehicle application may not be the primary intended application for the engine. We request comment on which of the already established standards and programs would be a useful certification option for small businesses.

Additionally, a certified snowmobile engine produced by a large snowmobile manufacturer could be used by a small snowmobile manufacturer, provided the small manufacturer did not alter the engine in such a way as to cause it to exceed the snowmobile emission standards. This would provide a reasonable degree of emission control provided all other elements of the program were met. For example, if the only change a manufacturer were to make to the certified engine was to replace the stock Y-pipes and exhaust pipes with pipes of similar configuration or the stock muffler and air intake box with a muffler and air box of similar air flow, the engine could, subject to our review, still be eligible for this flexibility option. The manufacturer could also change the carburetor to have a leaner air/fuel ratio without losing eligibility. We believe that the manufacturer in such cases could establish a reasonable basis for knowing that emissions performance is not negatively affected be the changes. However, if the manufacturer were to change the bore or stroke of the engine, the engine would no longer qualify, as emissions could increase. We propose to allow the above approach for small snowmobile manufacturers.

7. Averaging, Banking, and Trading

For the overall program, we are proposing corporate-average emission standards with opportunities for banking and trading of emission credits. We would expect the averaging provisions to be most helpful to manufacturers with broad product lines. Small manufacturers and small importers with only a few models might not have as much opportunity to take advantage of these flexibilities. However, we received comment from one small manufacturer supporting these types of provisions as a critical component of the program. We request comment on how the provisions could be enhanced for small business to make them more useful.

8. Hardship Provisions

We are proposing provisions to address hardship circumstances, as described in Section VII.C.

9. Unique Snowmobile Engines

Even with the broad flexibilities described above, there may be a situation where a small snowmobile manufacturer cannot comply. Therefore, we propose an additional provision to allow a small snowmobile manufacturer to petition us for relaxed standards for one or more engine families. The manufacturer would have to justify that the engine has unique design, calibration, or operating characteristics that make it atypical and infeasible or highly impractical to meet the emission-reduction requirements, considering technology, cost, and other factors. At our discretion, we would then set an alternative standard at a level between the prescribed standard and the baseline level. Such a standard would be intended to apply until the engine family is retired, or modified in such a way as to increase emissions. These engines would be excluded from the averaging calculation. We seek comment on allowing this provision for up to 300 engines per year per manufacturer, which would ensure that it is sufficiently available for those manufacturers needing it most.

We seek comment on initial and deadline dates for submitting these petitions. While any relief would be enacted for the first year standards apply, there may be value to getting feedback early. It would seem reasonable that the first date for submittals would be during the first year of requirements for large manufacturers. The deadline for submittals might be at some time during the last year of the small-business delay.

F. Technological Feasibility of the Standards

1. Off-Highway Motorcycles and ATVs

We believe the proposed standards are technologically feasible given the availability of emission-control technologies in the context of the proposed program, as described below.

a. What are the baseline technologies and emission levels? As discussed earlier, off-highway motorcycles and ATVs are equipped with relatively small (48 to 650 cc) high-performance two- or four-stroke single cylinder engines that are either air- or liquid-cooled.[159] Since these vehicles are unregulated outside of the state of California, the main emphasis of engine design is on performance, durability, and cost and thus they generally have no emission controls. The fuel systems used on these engines are almost exclusively carburetors. Two-stroke engines

[159] The engines are small relative to automotive engines. For example, automotive engines typically range from one liter to well over five liters in displacement, whereas off-highway motorcycles would range from 0.05 liters to 0.65 liters.

lubricate the piston and crankshaft by mixing oil with the air and fuel mixture. This is accomplished by most contemporary 2-stroke engines with a pump that sends two-cycle oil from a separate oil reserve to the carburetor where it is mixed with the air and fuel mixture. Some less expensive two-stroke engines require that the oil be mixed with the gasoline in the fuel tank. Four-stroke engines inject oil via a pump throughout the engine as the means of lubrication. With the exception of those vehicles certified in California, most of these engines are unregulated and thus have no emission controls. For performance and durability reasons, off-highway motorcycle and ATV engines all tend to operate with a ''rich'' air and fuel mixture. That is, they operate with excess fuel, which enhances performance and allows engine cooling to promote longer engine life. However, rich operation results in high levels of HC, CO, and PM emissions. Also, two-stroke engines tend to have high scavenging losses, where up to a third of the unburned air and fuel mixture goes out of the exhaust resulting in high levels of HC emissions.

b. What technology approaches are available to control emissions? Several approaches are available to control emissions from off-highway motorcycles and ATVs. The simplest approach would consist of modifications to the base engine, fuel system, cooling system, and recalibration of the air and fuel mixture. These could, for example, consist of changes to valve timing for four-stroke engines, changing from air- to liquid-cooling, and the use of advanced carburetion techniques or electronic fuel injection in lieu of traditional carburetion systems. Other approaches could include the use of secondary air injected into the exhaust, an oxidation or three-way catalyst, or a combination of secondary air and a catalyst. The engine technology that may have the most potential for maximizing emission reductions from two-stroke engines is the use of direct fuel injection. Direct fuel injection is able to reduce or even eliminate scavenging losses by pumping only air through the engine and then injecting fuel into the combustion chamber after the intake and exhaust ports have closed. The use of oxidation catalysts in conjunction with direct injection could potentially reduce emissions even further. Finally, conversion of two-stroke engine technology to four-stroke engine technology would significantly reduce HC emissions.

None of these technologies should have any negative noise, safety, or energy impacts. Fuel injection can improve the combustion process which can result in lower engine noise. The vast majority of four-stroke engines used in off-highway motorcycles and ATVs are considerably quieter than their two-stroke counterparts. Fuel injection has no impact on safety and four-stroke engines often have a more ''forgiving'' power band which means the typical operator may find the performance of the machine to be more reasonable and safe. The use of fuel injection, the enleanment of the air and fuel mixture and the use of four-stroke technology all can result in significant reductions in fuel consumption.

c. What technologies are most likely to be used to meet the proposed standards? 2006 Standards. Four-Stroke Engines. We believe off-highway motorcycles and ATVs utilizing four-stroke engines will need only to make some minor calibration changes and improvements to the carburetor to meet our proposed emission standards for the 2006 model year. The calibration changes will most likely consist of reducing the amount of fuel in the air/fuel mixture. This is commonly referred to as enleaning the air/fuel ratio. Although four-stroke engines produce considerably lower levels of HC than two-stroke engines, the four-stroke engines used in off-highway motorcycles and ATVs all tend to be calibrated to operate with a rich air/fuel ratio for performance and durability benefits. This rich operation results in high levels of CO, since CO is formed in the engine when there is a lack of oxygen to complete combustion. We believe that many of these engines are calibrated to operate richer than needed, because they have either never had to consider emissions when optimizing air/fuel ratio or those that are certified to the California standards can operate richer because the California ATV CO standards are fairly lenient. Thus, we do not believe the standards will significantly reduce the performance or durability of these engines. Carburetion improvements could include increased carburetor tolerances, which would ensure more precise flow of fuel and air resulting in better fuel atomization (i.e., smaller fuel droplets), better combustion and less emissions.

Since our proposed emission standards are for HC+NO_X, as well as for CO, manufacturers will have to use an emission-control strategy or technology that doesn't cause NO_X emissions to increase disproportionately. However, since all of these vehicles operate with rich air/fuel ratios, as discussed above, NO_X levels from these engines are generally low and strategies designed to focus on HC reduction should allow manufacturers to meet our proposed standards without significantly increasing NO_X levels.

Two-Stroke Engines. Off-highway motorcycles and ATVs using two-stroke engines will present a greater challenge for compliance with the proposed standards. We believe it is possible for a two-stroke engine equipped with direct injection and an oxidation catalyst to meet our proposed standards. However, there are several issues associated with direct injection, such as system durability and the need for high electrical system output, that need to be resolved before it can be successfully integrated into off-highway motorcycle and ATV applications by the 2006 model year. For example, there is concern over how durable a direct injection system would be when exposed to harsh environmental conditions such as water, mud, rocks and sand, to name a few. The typical electrical system on a two-stroke off-highway motorcycle and ATV uses a magneto system which produces between 250 and 300 watts of electrical power. A typical direct injection system needs up to 1,000 watts of electrical power, meaning a traditional low-cost magneto system would be insufficient and possibly have to be replaced with an expensive and cumbersome alternator, similar to what is used on automobiles. For these reasons, and because of the potential complexities and cost of a direct injection system, we anticipate that most manufacturers would chose to convert models using two-stroke engines to four-stroke engines. Most manufacturers have experience with four-stroke engine technology and currently have several models powered by four-stroke engines. This is especially true in the ATV market where four-stroke engines account for 80 percent of sales. Because four-stroke engines have been so prevalent over the last 10 years in the off-highway motorcycle and ATV industry, manufacturers have developed a high level of confidence in four-stroke technology and its application. In addition to converting to four-stroke technology, manufacturers will also most likely have to make some minor calibration and carburetion improvements to meet the proposed 2006 emission standards.

2009 Standards. As discussed above, the proposed 2009 standards are proposed to apply only to ATVs. To meet these standards, we believe manufacturers will need to use four-stroke engines with further advancements in carburetor calibrations and improved tolerances or possibly

even switch to electronic fuel injection for some models. There is currently one manufacturer who uses electronic fuel injection in their off-highway motorcycles and ATVs. The technologies most likely to be used to meet these standards are secondary air and/or an oxidation catalytic converter.

Secondary air has been used by passenger cars and highway motorcycles for many years as a means to help control HC and CO. The hot exhaust gases coming from the combustion chamber contain significant levels of unburned HC and CO. If sufficient oxygen is present, these gases will continue to react in the exhaust system, reducing the amount of pollution emitted into the atmosphere. To assure that sufficient oxygen is present in the exhaust, air is injected into the exhaust system. For off-highway motorcycles and ATVs, the additional air can be injected into the exhaust manifold using a series of check valves which use the normal pressure pulsations in the exhaust manifold to draw air from outside. We have tested several four-stroke ATVs with secondary air injected into the exhaust manifold and found that the HC and CO emission levels were at or below our proposed 2009 standards (further details of our secondary air testing are described in the Draft Regulatory Support Document). Thus, we believe secondary air injection alone could be a viable technology used by ATV manufacturers to meet our proposed 2010 standards.

We also tested several ATVs with oxidation catalysts. We evaluated several different catalyst configurations with varying size, loading, cell density, and washcoat. We also examined different catalyst locations in the exhaust system. We found that a relatively small oxidation catalyst located in the exhaust system produced emission levels below our proposed emission standards. Therefore, we also believe that the use of an oxidation catalyst could be another viable technology available to ATV manufacturers to meet our proposed 2009 emission standards.

2. Snowmobiles

a. What are the baseline technologies and emission levels? As discussed earlier, snowmobiles are equipped with relatively small high-performance two-stroke two and three cylinder engines that are either air- or liquid-cooled. Since these vehicles are currently unregulated, the main emphasis of engine design is on performance, durability, and cost and thus they have no emission controls. The fuel system used on these engines are almost exclusively carburetors, although some have electronic fuel injection. Two-stroke engines lubricate the piston and crankshaft by mixing oil with the air and fuel mixture. This is accomplished by most contemporary 2-stroke engines with a pump that sends two-cycle oil from a separate oil reserve to the carburetor where it is mixed with the air and fuel mixture. Some less expensive two-stroke engines require that the oil be mixed with the gasoline in the fuel tank. Snowmobiles currently operate with a ''rich'' air and fuel mixture. That is, they operate with excess fuel, which enhances performance and allows engine cooling which promotes longer lasting engine life. However, rich operation results in high levels of HC, CO, and PM emissions. Also, two-stroke engines tend to have high scavenging losses, where up to a third of the unburned air and fuel mixture goes out of the exhaust resulting in high levels of raw HC. Current average snowmobile emission rates are 397 g/kW-hr (296 g/hp-hr) CO and 150 g/kW-hr (111 g/hp-hr) HC.

b. What technology approaches are available to control emissions? We believe the proposed standards would be technologically feasible. A variety of technologies are currently available or in stages of development to be available for use on 2-stroke snowmobiles. These include improvements to carburetion (improved fuel control and atomization, as well as improved production tolerances), enleanment strategies for both carbureted and fuel injected engines, and semi-direct and direct fuel injection. In addition to these 2-stroke technologies, converting to 4-stroke engines is feasible for some snowmobile types. Each of these is discussed in the following paragraphs.

There are several things that can be done to improve carburetion in snowmobile engines. First, strategies to improve fuel atomization would promote more complete combustion of the fuel/air mixture. Additionally, production tolerances could be improved for more consistent fuel metering. Both of these things would allow for more accurate control of the air/fuel ratio. In conjunction with these improvements in carburetion, the air/fuel ration could be leaned out some. Snowmobile engines are currently calibrated with rich air/fuel ratios for durability reasons. Leaner calibrations would serve to reduce CO and HC emissions. Such calibration changes could reduce snowmobile engine durability. However, there are many engine improvements that could be made to regain lost durability that occurs with leaner calibration. These include changes to the cylinder head, pistons, ports and pipes to reduce knock. In addition critical engine components could be made more robust to improve durability.

The same calibration changes to the air/fuel ratio just discussed for carbureted engines could also be employed, possibly with more accuracy, with the use of fuel injection. At least one major snowmobile manufacturer currently employs electronic fuel injection on several of its snowmobile models.

In addition to rich air/fuel ratios, one of the main reasons that two-stroke engines have such high HC emission levels is that they release a substantial amount of unburned fuel into the atmosphere as a result from scavenging losses, as described above. One way to reduce or eliminate such losses is to inject the fuel into the cylinder after the exhaust port has closed. This can be done by injecting the fuel into the cylinder through the transfer port (semi-direct injection) or directly into the cylinder (direct injection). Both of these approaches are currently being used successfully in two-stroke personal watercraft engines. We believe these technologies hold promise for application to snowmobiles. Manufacturers must address a variety of technical design issues for adapting the technology to snowmobile operation, such as operating in colder ambient temperatures and at variable altitude. The several years of lead time give manufacturers time to incorporate these development efforts into their overall research plan as they apply these technologies to snowmobiles.

In addition to the two-stroke technologies just discussed, the use of four-stroke engines in snowmobiles is another feasible approach to reduce emissions. Since they do not scavenge the exhaust gases with the incoming air/fuel mixture, four-stroke engines have inherently lower HC emissions compared to two-strokes. Four-stroke engines have a lower power to weight ratio than two-stroke engines and are heavier. Thus, they are more appropriately used in snowmobile models where extreme power and acceleration are not the primary selling points. Such models include touring and sport trail sleds, as opposed to high performance sleds such as those used for aggressive trail, cross country, mountain and lake riding.

c. What technologies are most likely to be used to meet the proposed standards. 2006 Standards. We expect that, in the context of an emission-credit program, manufacturers might choose to take different paths to meet the

proposed 2006 model year emission standards. We expect that many of the reductions required will come from aggressive implementation of improved carburetion and enleanment strategies. Manufacturers have indicated to us that direct injection strategies can result in emission reductions of 70 to 75 percent for HC and 60 to 65 percent for CO. Certification results from 2000 model year outboard engines and PWC support such reductions. At least one manufacturer has indicated that direct injection technology will be available for snowmobiles on at least some models well in advance of 2006. We believe that as manufacturers learn to apply direct injection strategies they may choose to implement those technologies on some of their more expensive sleds and use less aggressive technologies, such as improved carburetion and enleanment on their lower performance models. Finally, there are at least two snowmobile manufacturers planning on offering four-stroke models in the future, and we expect further interest in four-strokes to develop for those snowmobile categories for which four-strokes are a good fit.

2010 Standards. We expect that, in the context of an emission credit program, manufacturers would choose to apply enleanment strategies and the associated engine modification to roughly half of their production. The rest of their production would encompass primarily direct injection two stroke and to a much lesser extent, four stroke technology.

VII. General Nonroad Compliance Provisions

This section describes a wide range of compliance provisions that apply generally to all of the engines and vehicles that would be subject to the proposed standards. Several of these provisions apply not only to manufacturers, but also to equipment manufacturers installing certified engines, remanufacturing facilities, operators, and others.

The proposed regulatory text for the compliance requirements for Large SI and recreational vehicles would be contained in a new Part 1068 of title 40, entitled ''General Compliance Programs for Nonroad Engines.'' The compliance provisions for marine engines would be the same as those in our existing programs for commercial diesel marine engines (40 CFR part 94), which are similar to the provisions proposed in 40 CFR part 1068.

The following discussion of the general nonroad provisions follows the proposed regulatory text. For ease of reference, the subpart designations are provided. We request comment on all these provisions.

A. Miscellaneous Provisions (Part 1068, Subpart A)

This regulation contains some general provisions, including general applicability and the definitions that apply to Part 1068. Other provisions concern good engineering judgment, how we would handle confidential information; how the EPA Administrator delegates decision-making authority; and when we may inspect a manufacturer's facilities, engines, or records.

The process of testing engines and preparing an application for certification requires the manufacturer to make a variety of judgments. This includes, for example, selecting test engines, operating engines between tests, and developing deterioration factors. Section 1068.5 of the proposed regulations describes the methodology we propose to use to evaluate concerns related to manufacturers' use of good engineering judgment in cases where the manufacturer has such discretion. If we find a problem in these areas, we would take into account the degree to which any error in judgment was deliberate or in bad faith. This subpart is consistent with provisions in the final rule for light-duty highway vehicles and commercial marine diesel engines.

B. Prohibited Acts and Related Requirements (Part 1068, Subpart B)

The proposed provisions in this subpart lay out a set of prohibitions for engine manufacturers, equipment manufacturers, operators, and engine rebuilders to ensure that engines comply with the emission standards. These provisions are summarized below, but readers are encouraged to review the proposed regulatory text. These provisions are intended to help ensure that each new engine sold or otherwise entered into commerce in the United States is certified to the relevant standards, that it remains in its certified configuration throughout its lifetime, and that only certified engines are used in the appropriate nonroad equipment.

1. General Prohibitions (§ 1068.100)

This proposed regulation contains several prohibitions consistent with the Clean Air Act. No one may sell an engine in the United States without a valid certificate of conformity issued by EPA, deny us access to relevant records, or keep us from entering a facility to test or inspect engines. In addition, no one may remove or disable a device or design element that may affect an engine's emission levels, or manufacture any device that will make emission controls ineffective, which we would consider tampering. We have generally applied the existing policies developed for tampering with highway engines and vehicles to nonroad engines.[160] Other prohibitions reinforce manufacturers' obligations to meet various certification requirements. We also prohibit selling engine parts that prevent emission-control systems from working properly. Finally, for engines that are excluded for certain applications (i.e., stationary or solely for competition), we generally prohibit using these engines in other applications.

These proposed prohibitions are the same as those that apply to other engines we have regulated in previous rulemakings. Each prohibited act has a corresponding maximum penalty as specified in Clean Air Act section 205. As provided for in the Federal Civil Penalties Inflation Adjustment Act of 1990, Public Law 10–410, these maximum penalties are in 1970 dollars and should be periodically adjusted by regulation to account for inflation. The current penalty amount for each violation is $27,500.[161]

2. Equipment Manufacturer Provisions (§ 1068.105)

According to this proposed regulation, equipment manufacturers may not sell new equipment with uncertified engines once the emission standards begin to apply. We would allow a grace period for equipment manufacturers to use up their supply of uncertified engines, as long as they follow their normal inventory practices for buying engines.

We propose to require equipment manufacturers to observe the engine manufacturers emission-related installation specifications to ensure that the engine remains consistent with the application for certification. This may include such things as radiator specifications, placement of catalytic converters, diagnostic signals and interfaces, and steps to minimize evaporative emissions.

If equipment manufacturers install a certified engine in a way that obscures the engine label, we propose to require them to add a duplicate label on the equipment. Equipment manufacturers may make these labels or get them from the engine manufacturer.

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[160] ''Interim Tampering Enforcement Policy,'' EPA memorandum from Norman D. Shulter, Office of General Counsel, June 25, 1974 (Docket A–2000–01; document II–B–20).

[161] EPA acted to adjust the maximum penalty amount in 1996 (61 FR 69364, December 31, 1996). See also 40 CFR part 19.

If equipment manufacturers don't fulfill the responsibilities we describe in this section, we would consider them to be violating one or more of the prohibited acts described above.

3. In-Service Engines (§ 1068.110)

The proposed regulations would prevent manufacturers from requiring owners to use any certain brand of aftermarket parts and give the manufacturer responsibility for engine servicing related to emissions warranty, leaving the responsibility for all other maintenance with the owner. This proposed regulation would also reserve our right to do testing (or require testing) to investigate potential defeat devices, as authorized by the Act.

4. Engine Rebuilding (§ 1068.120)

We are proposing to establish rebuild provisions for all the nonroad engines subject to the proposed emission standards. This approach is similar to what applies to heavy-duty highway engines, nonroad diesel engines, and commercial marine diesel engines. This is necessary to prevent an engine rebuilder from rebuilding engines in a way that disables the engine's emission controls or compromises the effectiveness of the emission-control system. For businesses involved in commercial engine rebuilding, we are proposing minimal recordkeeping requirements so rebuilders can show that they comply with regulations.

In general, we propose to require that anyone who rebuilds a certified engine must restore it to its original (or a lower-emitting) configuration. We are proposing to add unique requirements for rebuilders to replace some critical emission-control components such as fuel injectors and oxygen sensors in all rebuilds for engines that use those technologies. We are also proposing that rebuilders replace an existing catalyst if there is evidence that the catalyst is not functional; for example, if a catalyst has lost its physical integrity with loose pieces rattling inside, it would need to be replaced. See § 1068.65 for more detailed information.

The proposed rebuilding provisions define good rebuilding practices to help rebuilders avoid violating the prohibition on ''removing or disabling'' emission-control systems. We therefore propose to extend these provisions to individuals who rebuild their own engines, but without any recordkeeping requirements.

We request comment on applying these proposed requirements for engine rebuilding and maintenance to the engines and vehicles subject to this rulemaking. In addition, we request comment on the associated recordkeeping requirements.

C. Exemptions (Part 1068, Subpart C)

We are proposing to include several exemptions for certain specific situations. Most of these are consistent with previous rulemakings. We highlight the new or different proposed provisions in the following paragraphs. In general, exempted engines would need to comply with the requirements only in the sections related to the exemption. Note that additional restrictions could apply to importing exempted engines (see Section VII.D). Also, we are also proposing that we may require manufacturers (or importers) to add a permanent label describing that the engine is exempt from emission standards for a specific purpose. In addition to helping us enforce emission standards, this would help ensure that imported engines clear Customs without difficulty.

1. Testing

Anyone would be allowed to request an exemption for engines used only for research or other investigative purposes.

2. Manufacturer-Owned Engines

Engines that are used by engine manufacturers for development or marketing purposes could be exempted from regulation if they are maintained in the manufacturers' possession and are not used for any revenue-generating service.

3. Display Engines

Engine manufacturers would get an exemption without request if the engines are for display only.

4. National Security

Engine manufacturers could receive an exemption for engines they can show are needed by an agency of the federal government responsible for national defense. For cases where the engines will not be used on combat applications, the manufacturer would have to request the exemption with the endorsement of the procuring government agency.

5. Exported Engines

Engines that will be exported to countries that don't have the same emission standards as those that apply in the United States would be exempted without need for a request. This exemption would not be available if the destination country has the same emission standards as those in the United States.

6. Competition Engines

New engines that are used solely for competition are excluded from regulations applicable to nonroad engines. For purposes of our certification requirements, a manufacturer would receive an exemption if it can show that it produces the engine specifically for use solely in competition. In addition, engines that have been modified for use in competition would be exempt from the prohibition against tampering described above (without need for request). The literal meaning of the term ''used solely for competition'' would apply for these modifications. We would therefore not allow the engine to be used for anything other than competition once it has been modified. This also applies to someone who would later buy the engine, so we would require the person modifying the engine to remove or deface the original engine label and inform a subsequent buyer in writing of the conditions of the exemption.

7. Replacement Engines

An exemption would be available to engine manufacturers without request if that is the only way to replace an engine from the field that was produced before the current emission standards took effect. If less stringent standards applied to the old engine when it was new, the replacement engine would also have to meet those standards.

8. Hardship Related to Economic Burden

There are two types of hardship provisions. The first type of hardship program would allow small businesses to petition EPA for additional lead time (e.g., up to 3 years) to comply with the standards. A small manufacturer would have to make the case that it has taken all possible business, technical, and economic steps to comply but the burden of compliance costs would have a significant impact on the company's solvency. A manufacturer would be required to provide a compliance plan detailing when and how it would achieve compliance with the standards. Hardship relief could include requirements for interim emission reductions and/or purchase and use of emission credits. The length of the hardship relief decided during review of the hardship application would be up to one year, with the potential to extend the relief as needed. The second hardship program would allow companies to apply for hardship relief if circumstances outside their control cause the failure to comply (i.e., supply contract broken by parts supplier) and if the failure to sell the subject engines would have a major impact on the company's solvency. See the proposed

regulatory text in 40 CFR 1068.240 and 1068.241 for additional details.

9. Hardship for Equipment Manufacturers

Equipment manufacturers in many cases depend on engine manufacturers to supply certified engines in time to produce complying equipment by the date emission standards begin to apply. This is especially true for industrial and marine applications. In other programs, we have heard of certified engines being available too late for equipment manufacturers to adequately accommodate changing engine size or performance characteristics. To address this concern, we are proposing to allow equipment manufacturers to request up to one extra year before using certified engines if they are not at fault and would face serious economic hardship without an extension. See the proposed regulatory text in 40 CFR 1068.245 for additional information.

D. Imports (Part 1068, Subpart D)

In general, the same certification requirements would apply to engines and equipment whether they are produced in the U.S. or are imported. This proposed regulation also includes some additional provisions that would apply if someone wants to import an exempted or excluded engine. For example, the importer would need written approval from us to import any exempted engine; this is true even if an exemption for the same reason doesn't require approval for engines produced in the U.S.

All the proposed exemptions described above for new engines would also apply to importation, though some of these apply only on a temporary basis. If we approve a temporary exemption, it would be available only for a defined period and could require the importer to post bond while the engine is in the U.S. There are several additional proposed exemptions that would apply only to imported engines.

—*Identical configuration:* This would be a permanent exemption to allow individuals to import engines that were designed and produced to meet applicable emission standards. These engines may not have the emission label only because they were not intended for sale in the United States. This exemption would apply to all the nonroad engines covered by this proposal. We did not finalize this exemption for commercial marine diesel engines, since we expected no individuals to own or import such an engine.

—*Personal use:* This would be a permanent exemption to allow individuals to import engines for their personal use. To prevent abuse of this exemption, we would require that importers own the exempted engines and we would generally exempt only one of each type of engine over an individual's lifetime.

—*''Antique'' engines:* We would generally treat used engines as new if they are imported without a certificate of conformity. However, this permanent exemption would allow for importation of uncertified engines if they are more than 20 years old in their original configuration.

—*Repairs or alterations:* This would be a temporary exemption to allow companies to repair or modify engines. This exemption would not allow for operating the engine, except as needed to do the intended work.

—*Diplomatic or military:* This would be a temporary exemption to allow diplomatic or military personnel to use uncertified engines during their term of service in the U.S.

We request comment on all the proposed exemptions for domestically produced and imported engines and vehicles.

E. Selective Enforcement Audit (Part 1068, Subpart E)

Clean Air Act section 206(b) gives us the discretion in any program with vehicle or engine emission standards to do selective enforcement auditing of production engines. In selective enforcement auditing, we would choose an engine family and give the manufacturer a test order detailing a testing program to show that production-line engines meet emission standards. The proposed regulation text describes the audit procedures in greater detail.

We intend generally to rely on manufacturers' testing of production-line engines to show that they comply with emission standards. However, we reserve our right to do selective enforcement auditing if we have reason to question the emission testing conducted and reported by the manufacturer.

F. Defect Reporting and Recall (Part 1068, Subpart F)

We are proposing provisions for defect reporting. Specifically, we are proposing that manufacturers tell us when they learn of a defect occurring 25 times or more for engine families with annual sales up to 10,000 units. This threshold of defects would increase proportionately for larger families. For catalyst-related defects, we propose a threshold of approximately half the frequency of noncatalyst problems to trigger a defect report. While these thresholds would depend on engine family sales, counting defects would not be limited to a single engine family. For example, if a manufacturer learns that operators reported 25 cases of a short-circuit in the electronic control unit from three different low-volume engine models spread over five years, that would trigger the need to file a defect report. This information could come from warranty claims, customer complaints, product performance surveys, or anywhere else. The proposed regulation language in § 1068.501 also provides information on the thresholds for triggering a further investigation for where a defect report is more likely to be necessary. We request comment on the proposed defect reporting provisions.

Under Clean Air Act section 207, if we determine 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. However, we also recognize the practical difficulty in implementing an effective recall program for nonroad engines. It would likely be difficult to properly identify all the affected owners absent a nationwide registration requirement similar to that for cars and trucks. The response rate for affected owners or operators to an emission-related recall notice is also a critical issue to consider. We recognize that in some cases, recalling noncomplying nonroad engines may not achieve sufficient environmental protection, so our intent is to generally allow manufacturers to nominate alternative remedial measures to address most potential noncompliance situations. We expect that successful implementation of appropriate alternative remediation would obviate the need for us to make findings of substantial nonconformity under section 207 of the Act. We would consider alternatives nominated by a manufacturer based on the following criteria; the alternatives should—

(1) Represent a new initiative that the manufacturer was not otherwise planning to perform at that time, with a clear connection to the emission problem demonstrated by the engine family in question;

(2) Cost more than foregone compliance costs and consider the time value of the foregone compliance costs and the foregone environmental benefit of the engine family;

(3) Offset at least 100 percent of the emission exceedance relative to that

required to meet emission standards (or Family Emission Limits); and

(4) Be possible to implement effectively and expeditiously and to complete in a reasonable time.

These criteria would guide us in evaluating projects to determine whether their nature and burden is appropriate to remedy the environmental impact of the nonconformity. We request comment on this approach to addressing the Clean Air Act provisions related to recall. In addition, we request comment on the proposed requirement to keep recall-related records until three years after a manufacturer completes all responsibilities under a recall order.

G. Public Hearings (Part 1068, Subpart G)

According to this regulation, manufacturers would have the opportunity to challenge our decision to suspend, revoke, or void an engine family's certificate. This also applies to our decision to reject the manufacturer's use of good engineering judgment (see § 1068.005). Part 1068, subpart G, describes the proposed procedures for a public hearing to resolve such a dispute.

VIII. General Test Procedures

The regulatory text in part 1065 is written with the intent to apply broadly to EPA engine programs. This proposal, however, applies to anyone who tests engines to show that they meet the emission standards for Large Industrial SI engines or for recreational vehicles. This includes certification testing, as well as all production-line and in-use testing. See the program descriptions above for testing provisions that are unique to Large SI engines. We may later propose to apply the same provisions to other engines, with any appropriate additions and changes. Recreational marine diesel engines would use the test procedures already adopted in 40 CFR part 94.

A. General Provisions

As we have done in previous programs, we are proposing specific test procedures to define how measurements are to be made, but would allow the use of alternate procedures if they are shown to be equivalent to our specified procedures. The test procedures proposed in part 1065 are derived from our test procedures in 40 CFR Part 86 for highway heavy-duty gasoline engines and light-duty vehicles. The procedures have been simplified (and to some extent generalized) to better fit nonroad engines. We request comment on all aspects of these proposed test procedures. We also request comment regarding whether any additional parts of the test procedures contained in 40 CFR part 86 (for highway vehicles and engines), in other parts that apply to nonroad engines, or in ISO 8178 should be incorporated into the final test procedures.

B. Laboratory Testing Equipment

The proposed regulations do not specify the type of engine or chassis dynamometer that must be used during testing. Rather, they include performance criteria that must be met during each test. These criteria are intended to ensure that deviations from the specified speed and load duty cycle are small. Steady-state testing calls for a minimal degree of sophistication in the dynamometer system.

Measuring emissions during transient operation calls for a greater degree of sophistication than steady-state testing. For chassis testing of recreational vehicles, we propose to use the specifications adopted in 40 CFR part 86 for highway engines. For Large SI engines, we based the dynamometer specifications around the capabilities of current dynamometers with enhanced control capabilities. Furthermore, we would require any EPA confirmatory testing to meet more stringent specifications than manufacturers testing their own engines.

In addition, for transient testing with recreational vehicles and any testing with Large SI engines, the proposed regulations specify that emissions be measured using a full-dilution constant-volume sampler (CVS) like those used to measure emissions from highway engines. This means that during a test, an engine's exhaust would be routed into a dilution tunnel where it would be mixed with air, and then sampled using a bag sampler system. After the test, the concentrations of HC, CO, and NO_X in the bag would be measured using conventional laboratory analyzers.

For industrial spark-ignition engines and snowmobiles, the proposed steady-state test procedures specify measuring emissions with dilute-sampling equipment. Some manufacturers have expressed a preference to continue with their established practice of using raw-sampling equipment and procedures. While we believe dilute-sampling is most appropriate for these engines, the proposed provisions for alternate testing procedures may allow for raw-sampling measurements. As specified in paragraph 1065.010(c)(3) of the proposed regulations, we would allow manufacturers to use alternate procedures that are shown to be equivalent to the proposed procedures. We request comment on this approach to emission-measurement procedures. Specifically, we request comment on the degree of equivalence that should be shown to gain approval of alternate procedures. See the final rule for 2007 heavy-duty highway engine emission standards for one approach of defining a tolerance on equivalence for alternate procedures (66 FR 5002, January, 18, 2001).

C. Laboratory Testing Procedures

We are proposing specific procedures for running the test. These procedures are outlined briefly here, with a more detailed description of the most significant aspects. Before starting the test, it would be necessary to operate the engine for some time to improve the stability of the emissions, or to make the engine more representative of in-use engines. This is called service accumulation, and may take one of two forms. In the first method, a new engine is operated for about 50 hours as a break-in period. This would be done for most or all emission-data engines (for certification). The second method is much longer (up to the full useful life), and is done to obtain deterioration factors.

Once an engine is ready for testing, it is connected to the dynamometer with its exhaust flowing into the dilution tunnel. The dynamometer is controlled to make the engine follow the specified duty cycle. A continuous sample would be collected from the dilution tunnel for each test segment or test mode using sample bags. These bags would then be analyzed to determine the concentrations of HC, CO, and NO_X.

1. Test Speeds

The definition of maximum test speed, where speed is the angular velocity of an engine's crankshaft (usually expressed in revolutions per minute, or rpm), is an important aspect of the duty cycles for testing. Until recently, we relied on engine manufacturers to declare reasonable rated speeds for their engines and then used the rated speed as the maximum test speed. However, to have a more objective measure of an engine's maximum test speed, we have established an objective procedure for measuring this engine parameter.[162]

We propose to define the maximum test speed for any engine to be the single point on an engine's maximum-power versus speed curve that lies farthest away from the zero-power, zero-speed point on a normalized maximum-power

[162] See the final rule for commercial marine diesel engines for a broader discussion of maximum test speed (64 FR 249, December 29, 1999).

versus speed plot. In other words, consider straight lines drawn between the origin (speed = 0, load = 0) and each point on an engine's normalized maximum-power versus speed curve. Maximum test speed is defined at that point where the length of this line reaches its maximum value. For constant-speed engines, maximum test speed is the engine's rated speed.

Intermediate speed for steady-state duty cycles is generally defined as the speed at which the engine generates its maximum torque value. However, in cases where the maximum torque occurs at a speed that is less than 60 percent or greater than 75 percent of the rated speed, the intermediate speed is often specified as either 60 or 75 percent of rated speed, whichever is closer to the speed of maximum torque. We propose to use this approach, using the maximum test speed described above to calculate these percentage values.

We request comment on applying this method of determining rated speed to ATVs certified to engine-based emission standards, recreational marine diesel engines, and Large SI engines.

2. Maintenance

As described in Section III.C.1, we are proposing limits on the amount of scheduled maintenance manufacturers may prescribe for their customers to ensure that engines continue to meet emission standards. If manufacturers would specify unreasonably frequent maintenance, there would be little assurance that in-use engines would continue to operate at certified emission levels. We would also apply these minimum maintenance intervals to engines the manufacturer operates for service accumulation before testing for emissions. For example, manufacturers could not install a new catalyst on a Large SI engine after 2,000 hours of operation, then select that engine for the in-use testing program. Similarly, manufacturers could not replace fuel-system components on a recreational vehicle during the course of service accumulation for establishing deterioration factors. We would not restrict scheduling of routine maintenance item such as changing engine oil and replacing oil, fuel, or air filters. We may also allow changing spark plugs, even though we are aware that spark plugs can significantly affect emissions.

IX. Projected Impacts

This section summarizes the projected impacts of the proposed emission standards. The anticipated environmental benefits are compared with the projected cost of the program for an assessment of the cost per ton of reducing emissions for this proposal.

A. Environmental Impact

To estimate nonroad engine and vehicle emission contributions, we used the latest version of our NONROAD emissions model. This model computes emission levels for a wide variety of nonroad engines, and uses information on emission rates, operating data, and population to determine annual emission levels of various pollutants. A more detailed description of the methodology used for projecting inventories and projections for additional years can be found in the Chapter 6 of the Draft Regulatory Support Document. We request comment on all aspects of the emission inventory analysis, including the usage rates and other inputs used in the analysis.

Tables IX.A–1 and IX.A–2 contain the projected emission inventories for the years 2010 and 2020, respectively, from the engines and vehicles subject to this proposal under the base case (i.e., without the proposed standards taking effect) and assuming the proposed standards take effect. The percent reductions based on a comparison of estimated emission inventories with and without the proposed emission standards are also presented.

TABLE IX.A–1.—2010 PROJECTED EMISSIONS INVENTORIES

[Thousand short tons]

Category	Exhaust CO			Exhaust NO_X			Exhaust HC**		
	Base case	With proposed standards	Percent reduction	Base case	With proposed standards	Percent reduction	Base case	With proposed standards	Percent reduction
Industrial SI >19kW	2,615	1,152	56	397	152	62	293	111	62
Snowmobiles	567	415	27	1	1	0	213	155	27
ATVs	3,901	3,380	13	21	21	0	1,098	756	31
Off-highway motorcycles	194	172	11	1	1	0	143	112	22
Recreational Marine diesel*	5	5	0	31	29	7	0.9	1.0	10
Total	7,282	5,124	30	451	204	55	1,748	1,135	35

*We also anticipate a 2 percent reduction in direct PM from a baseline of inventory of 1,184 tons in 2010 to a control inventory of 1,158 tons.
**The Industrial SI >19 kW estimate includes both exhaust and evaporative emissions.

TABLE IX.A–2.—2020 PROJECTED EMISSIONS INVENTORIES

[Thousand short tons]

Category	Exhaust CO			Exhaust NO_X			Exhaust HC**		
	Base case	With proposed standards	Percent reduction	Base case	With proposed standards	Percent reduction	Base case	With proposed standards	Percent reduction
Industrial SI >19kW	2,991	231	92	486	77	84	346	50	86
Snowmobiles	609	227	63	2	2	0	229	85	63
ATVs	4,589	3,041	34	25	25	0	1,301	205	84
Off-highway motorcycles	208	154	26	1	1	0	154	77	50
Recreational Marine diesel*	6	6	0	39	32	17	1.3	1.0	25

TABLE IX.A–2.—2020 PROJECTED EMISSIONS INVENTORIES—Continued

[Thousand short tons]

Category	Exhaust CO			Exhaust NO_X			Exhaust HC**		
	Base case	With proposed standards	Percent reduction	Base case	With proposed standards	Percent reduction	Base case	With proposed standards	Percent reduction
Total	8,404	3,658	56	552	137	75	2,032	418	79

*We also anticipate a 6 percent reduction in direct PM from a baseline of inventory of 1,470 tons in 2020 to a control inventory of 1,390 tons.
**The Industrial SI >19 kW estimate includes both exhaust and evaporative emissions.

As described in Section II, we project there would also be environmental benefits associated with reduced haze in many sensitive areas.

Finally, anticipated reductions in hydrocarbon emissions correspond with reduced emissions of the toxic air emissions referenced in Section II.

B. Economic Impact

In assessing the economic impact of setting emission standards, we have made a best estimate of the technologies and their associated costs to meet the proposed standards. In making our estimates we have relied on our own technology assessment, which includes information supplied by individual manufacturers and our own in-house testing. Estimated costs include variable costs (for hardware and assembly time) and fixed costs (for research and development, retooling, and certification). The analysis also considers total operating costs, including maintenance and fuel consumption. Cost estimates based on the projected technologies represent an expected change in the cost of engines as they begin to comply with new emission standards. All costs are presented in 2001 dollars. Full details of our cost analysis can be found in Chapter 5 of the Draft Regulatory Support Document. We request comment on this cost information, and the issues discussed below.

Cost estimates based on the current projected costs for our estimated technology packages represent an expected incremental cost of vehicles in the near term. For the longer term, we have identified factors that would cause cost impacts to decrease over time. First, we project that manufacturers will generally recover their fixed costs over a five-year period, so these costs disappear from the analysis after the fifth year of production. Second, the analysis incorporates the expectation that manufacturers and suppliers will apply ongoing research and manufacturing innovation to making emission controls more effective and less costly over time. Research in the costs of manufacturing has consistently shown that as manufacturers gain experience in production and use, they are able to apply innovations to simplify machining and assembly operations, use lower cost materials, and reduce the number or complexity of component parts.[163] (see the Draft Regulatory Support Document for additional information). The cost analysis generally incorporates this learning effect by decreasing estimated variable costs by 20 percent starting in the third year of production and an additional 20 percent starting in the sixth year of production.

Table IX.B–1 summarizes the projected costs to meet the new emission limits (retail-price equivalent). Long-term impacts on engine costs are expected to decrease as manufacturers fully amortize their fixed costs and learn to optimize their designs and production processes to meet the standards more efficiently. The tables also show our projections of reduced operating costs for some engines (calculated on a net present value basis), which generally results from substantial reductions in fuel consumption.

We estimate that the anticipated increase in the cost of producing new Large SI engines for the proposed 2004 standards is estimated to range from $550 to $800, depending on fuel type, with a composite estimated cost of $600. This cost is attributed to upgrading engines to operate with closed-loop fuel systems and three-way catalysts. These technologies also improve the overall performance of these engines, including improvements to fuel economy that result in reduced operating costs that fully offset the additional hardware cost. We further estimate additional costs of $45 for the 2007 standards, which primarily involves additional development time to optimize engines using the same closed-loop systems with three-way catalysts. While these costs are a small percentage of the cost of industrial equipment, we are aware that this is no small change in this very competitive market. Given the compelling advantages of improved performance and reduced operating expenses, however, we believe manufacturers will generally be able to recover their costs over time.[164] We request comment on whether these estimated costs associated with emission controls would affect larger or smaller engines disproportionately to the overall cost of producing the engines.

Projected costs for ATVs and off-highway motorcycles average between $50 and $150 per unit. Initial standards are based on the emission-control capability of engines four-stroke engines. Those models that convert from two-stroke to four-stroke technology will see substantial fuel savings in addition to greatly reduced emissions. The second phase of standards for ATVs is based on recalibrating four-stroke engines for lower emissions and adding a two-way catalyst or other device to further reduce emissions. With an averaging program that allows manufacturers to apply varying degrees of technology to different models, we believe they will be able to tailor emission controls in a way that reflects the marketing constraints for their products. Fuel savings and improved performance offsets the additional cost of producing most of these vehicles.

We expect that the cost of the 2006 snowmobile standards will average $55 per snowmobile. These costs are based on manufacturers leaning out the air/fuel mixture, improving carburetors for better fuel control and less production

[163] For further information on learning curves, see Chapter 5 of the Economic Impact, from Regulatory Impact Analysis—Control if Air Pollution from New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements, EPA420–R–99–023, December 1999. A copy of this document is included in Air Docket A–2000–01, at Document No. II–A–83. The interested reader should also refer to previous final rules for Tier 2 highway vehicles (65 FR 6698, February 10, 2000), marine diesel engines (64 FR 73300, December 29, 1999), nonroad diesel engines (63 FR 56968, October 23, 1998), and highway diesel engines (62 FR 54694, October 21, 1997).

[164] Chapter 5 of the Draft Regulatory Support Document describes why we believe market forces haven't already led manufacturers to add fuel-saving technologies to their products.

variation, and modifying the engine to withstand higher temperatures and potential misfire episodes attributed to enleanment. We expect that the 2010 standards will be met through the application of direct injection 2-stroke technology on a significant portion of the fleet, as well as some conversion to 4-stroke engines. We project that the cost of these controls would average $216 per snowmobile, although we believe these costs would be offset by fuel savings and improved performance.

Recreational marine diesel engines would be expected to see increased costs averaging $443 per engine in the near term. We expect manufacturers to meet the proposed standards by improving fuel injection systems and making general design changes to the geometries, configurations, and calibrations of their engines. These figures are somewhat lower than we have projected for the comparable commercial marine engines, since the recreational models generally already have some of the emission-control technologies needed to meet the proposed emission standards.

TABLE IX.B–1.—ESTIMATED AVERAGE COST IMPACTS OF PROPOSED EMISSION STANDARDS

Engine type	Standard	Increased production cost per engine*	Lifetime operating costs per engine (NPV)
Large SI	2004	$600	−$3,985
Large SI	2007	45	.....
Snowmobiles	2006	55	.....
Snowmobiles	2010	216	−509
ATVs	2006	60	−102
ATVs	2009	52	.....
Off-highway motorcycles	2006	151	−98
Marine diesel	2006	443	.....

*The estimated long-term costs decrease by about 35 percent. Costs presented for second-phase standards for Large SI and ATVs are incremental to the first-phase standards.

The above analysis presents unit cost estimates for each engine type. These costs represent the total set of costs the engine manufacturers will bear to comply with emission standards. With current and projected estimates of engine and equipment sales, we translate these costs into projected direct costs to the nation for the new emission standards in any year. A summary of the annualized costs to manufacturers by equipment type is presented in Table IX.B–2. (The annualized costs are determined over the first twenty-years that the proposed standards would be effective.) The annual cost savings due to reduced operating expenses, start slowly, then increase as greater numbers of compliant engines enter the fleet. Table IX.B–2 presents a summary of the annualized reduced operating costs as well. Overall, we project, based on information currently available to us, that the annualized net savings to the economy would be approximately $260 million per year.

TABLE IX.B–2.—ESTIMATED ANNUAL COST TO MANUFACTURERS AND ANNUAL SAVINGS FROM REDUCED OPERATING COSTS OF THE PROPOSED EMISSION STANDARDS

Engine type	Annualized cost to manufacturers (millions/year)	Annualized savings from reduced operating costs (millions/year)
Large SI	$85	$324
Snowmobiles	24	28
ATVs	59	81
Off-highway motorcycles	13	10
Marine Diesel	3	0
Aggregate	184	443

C. Cost per Ton of Emissions Reduced

We calculated the cost per ton of emission reductions for the proposed standards. For snowmobiles, this calculation is on the basis of CO emissions. For all other engines, we attributed the entire cost of the proposed program to the control of ozone precursor emissions (HC or NO_X or both). A separate calculation could apply to reduced CO or PM emissions in some cases. Assigning the full compliance costs to a narrow emissions basis leads to cost-per-ton values that underestimate of the value of the proposed program.

Table IX.C–1 presents the near-term discounted cost-per-ton estimates for the various engines covered by the proposal. (The aggregate cost-per-ton estimates are over the first 20 years of the proposed programs.) Reduced operating costs more than offset the increased cost of producing the cleaner engines for Phase 1 Large SI, Phase 1 ATV, and Phase 2 snowmobile engines. The cost to society and the associated cost-per-ton figures for these engines, and the aggregate values for all engines covered by this proposal, therefore show a net savings resulting from the proposed emission standards. The table presents these as $0 per ton, rather than calculating a negative value that has no clear meaning.

TABLE IX.C–1.—ESTIMATED COST-PER-TON OF THE PROPOSED EMISSION STANDARDS

Engine type	Standard	Discounted reductions per engine (short tons)*	Discounted cost per ton of HC+NO_X		Discounted cost per ton of CO	
			Without fuel savings	With fuel savings	Without fuel savings	With fuel savings
Large SI (Composite of all fuels)	2004	3.14	$220	$0	.....	.....
Large SI (Composite of all fuels)	2007	0.56	80	80	.....	.....
Snowmobiles	2006	1.18	.....	.....	$50	$50
Snowmobiles	2010	0.32	.....	.....	670	0
ATVs	2006	0.88	70	0	.....	.....
ATVs	2009	0.09	550	550	.....	.....
Off-highway motorcycles	2006	0.37	310	110	.....	.....
Marine diesel	2006	0.68	580	580	.....	.....
Aggregate	.....	.....	140	0	100	0

*HC+NO_X reductions, except snowmobiles which are CO reductions.

D. Additional Benefits

For most of the engine categories contained in today's proposal, we expect there will be a fuel savings as manufacturers redesign their engines to comply with the proposed standards. For ATVs and off-highway motorcycles, the fuel savings will be realized as manufacturers switch from 2-stroke to 4-stroke technologies. For snowmobiles, the fuel savings will be realized as manufacturers switch some of their engines to more fuel efficient 2-stroke technologies and some of their engines to 4-stroke technologies. For Large SI engines, the fuel savings will be realized as manufacturers adopt more sophisticated and more efficient fuel systems. This is true for all fuels. Overall, we project the fuel savings associated with the anticipated changes in technology would be about 730 million gallons per year once the program is fully phased in. These savings are factored into the calculated costs and costs per ton of reduced emissions, as described above.

The controls in this rule are a cost-effective means of obtaining reductions in NO_X, NMHC and CO emissions. A related subject concerns the value of the health and welfare benefits these reductions might produce. While we have not conducted a formal benefit-cost analysis for this rule, we believe the benefits of this rule clearly will greatly outweigh any cost.

Ozone causes a range of health problems related to breathing, including chest pain, coughing, and shortness of breath. Exposure to PM (including secondary PM formed in the atmosphere from NO_X and NMHC emissions) has been associated in epidemiological studies with premature death, increased emergency room visits, and increased respiratory symptoms, and exacerbation of existing cardio-pulmonary disease. Children, the elderly, and individuals with pre-existing respiratory conditions are most at risk regarding both ozone and PM. In addition, ozone and PM adversely affect the environment in various ways, including crop damage, acid rain, and visibility impairment. A discussion of the health and welfare effects from ozone and PM can be found in Section II of this preamble. Interested readers should also refer to Chapter 1 of the Draft Regulatory Support Document for this rule and Chapter 2 of EPA's ''Regulatory Impact Analysis: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements.''[165]

In two recent mobile-source control rules, for light-duty vehicles (the Tier 2/Gasoline Sulfur rule) and for highway heavy-duty engines and diesel fuel, we conducted a full analysis of the expected benefits once those rules are fully implemented. These rules, which primarily reduced NO_X and NMHC emissions, were seen to yield health and welfare benefits far exceeding the costs. EPA projected that besides reducing premature mortality, these rules will reduce chronic bronchitis cases, hospital admissions for respiratory and cardiovascular causes, asthma attacks and other respiratory symptoms, emergency room visits for asthma attacks, acute bronchitis, work loss days, minor restricted activity days, and decreased worker productivity.

The majority of the benefits from those recent rules were due to their NO_X and NMHC emission reductions. Given the similarities in pollutants being controlled, we would expect this rule to produce similar benefits per ton of emission reduction. Since the cost per ton of emission reduction for this rule is substantially lower than that for the two previous rules, we would expect an even more favorable benefit-cost ratio. Thus, we believe that the value of the health and welfare benefits of this rule would substantially outweigh any cost.

[165] Regulatory Impact Analysis: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements, document EPA420–R–00–026, December 2000. Docket No. 1–2000–01, Document No. II–A–13. This document is also available at *http://www.epa.gov/otaq/diesel.htm#documents.*

X. Public Participation

We request comment on all aspects of this proposal. This section describes how you can participate in this process.

A. How Do I Submit Comments?

We are opening a formal comment period by publishing this document. We will accept comments for the period indicated under **DATES** above. If you have an interest in the program described in this document, we encourage you to comment on any aspect of this rulemaking. We request comment on various topics throughout this proposal.

We attempted to incorporate all the comments received in response to the Advance Notice of Proposed Rulemaking, though not all comments are addressed directly in this document. Anyone who has submitted comments on the Advance Notice, or any previous publications related to this proposal, and feels that those comments have not been adequately addressed is encouraged to resubmit comments as appropriate.

Your comments will be most useful if you include appropriate and detailed supporting rationale, data, and analysis. If you disagree with parts of the proposed program, we encourage you to suggest and analyze alternate approaches to meeting the air quality goals described in this proposal. You should send all comments, except those containing proprietary information, to our Air Docket (see **ADDRESSES**) before the end of the comment period.

If you submit proprietary information for our consideration, you should clearly separate it from other comments

by labeling it ''Confidential Business Information.'' You should also send it directly to the contact person listed under **FOR FURTHER INFORMATION CONTACT** instead of the public docket. This will help ensure that no one inadvertently places proprietary information in the docket. If you want us to use your confidential information as part of the basis for the final rule, you should send a nonconfidential version of the document summarizing the key data or information. We will disclose information covered by a claim of confidentiality only through the application of procedures described in 40 CFR part 2. If you don't identify information as confidential when we receive it, we may make it available to the public without notifying you.

B. Will There Be a Public Hearing?

We will hold a public hearing in the Washington, DC area on October 24 and a second public hearing in Denver, CO on October 31. The hearings will start at 9:30 am and continue until everyone has had a chance to speak.

If you would like to present testimony at a public hearing, we ask that you notify the contact person listed above at least ten days before the hearing. You should estimate the time you will need for your presentation and identify any needed audio/visual equipment. We suggest that you bring copies of your statement or other material for the EPA panel and the audience. It would also be helpful if you send us a copy of your statement or other materials before the hearing.

We will make a tentative schedule for the order of testimony based on the notifications we receive. This schedule will be available on the morning of each hearing. In addition, we will reserve a block of time for anyone else in the audience who wants to give testimony.

We will conduct the hearing informally, and technical rules of evidence won't apply. We will arrange for a written transcript of the hearing and keep the official record of the hearing open for 30 days to allow you to submit supplementary information. You may make arrangements for copies of the transcript directly with the court reporter.

XI. Administrative Requirements

A. Administrative Designation and Regulatory Analysis (Executive Order 12866)

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether the regulatory action is ''significant'' and therefore subject to review by the Office of Management and Budget (OMB) and the requirements of this Executive Order. The Executive Order defines a ''significant regulatory action'' as any regulatory action that is likely to result in a rule that may:

- 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;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

A Draft Regulatory Support Document has been prepared and is available in the docket for this rulemaking and at the internet address listed under **ADDRESSES** above. This action was submitted to the Office of Management and Budget for review under Executive Order 12866. Estimated annual costs of this rulemaking, which proposes standards for engines in four distinct categories, are estimated to be $184 million per year, thus this proposed rule is considered economically significant. Written comments from OMB and responses from EPA to OMB comments are in the public docket for this rulemaking.

B. Regulatory Flexibility Act (RFA), As Amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 601 et seq.

1. Overview

The RFA generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) A small business that meet the definition for business based on SBA size standards (see table below); (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field. The following table provides an overview of the primary SBA small business categories potentially affected by this regulation.

PRIMARY SBA SMALL BUSINESS CATEGORIES POTENTIALLY AFFECTED BY THIS PROPOSED REGULATION

Industry	NAICS [a] codes	Defined by SBA as a small business if [b]
Motorcycles and motorcycle parts manufacturers	336991	<500 employees.
Snowmobile and ATV manufacturers	336999	<500 employees.
Independent Commercial Importers of Vehicles and parts	421110	<100 employees.
Nonroad SI engines	333618	<1,000 employees.
Internal Combustion Engines	333618	<1,000 employees.
Boat Building and Repairing	336612	<500 employees.
Fuel Tank Manufacturers	336211	<1,000 employees.

Notes:

[a] North American Industry Classification System

[b] According to SBA's regulations (13 CFR part 121), businesses with no more than the listed number of employees or dollars in annual receipts are considered ''small entities'' for purposes of a regulatory flexibility analysis.

2. Background

In accordance with Section 603 of the RFA, EPA prepared an initial regulatory flexibility analysis (IRFA) that examines the impact of the proposed rule on small entities along with regulatory alternatives that could reduce that impact. The IRFA is available for review in the docket and is summarized below.

The process of establishing standards for nonroad engines began in 1991 with a study to determine whether emissions of carbon monoxide (CO), oxides of nitrogen (NO_X), and volatile organic compounds (VOCs) from new and existing nonroad engines, equipment, and vehicles are significant contributors to ozone and CO concentrations in more than one area that has failed to attain the national ambient air quality standards for ozone and CO.[166] In 1994, EPA finalized its finding that nonroad engines as a whole ''are significant contributors to ozone or carbon monoxide concentrations'' in more than one ozone or carbon monoxide nonattainment area.[167]

Upon this finding, the Clean Air Act (CAA or the Act) requires EPA to establish standards for all classes or categories of new nonroad engines that cause or contribute to air quality nonattainment in more than one ozone or carbon monoxide (CO) nonattainment area. Since the finding in 1994, EPA has been engaged in the process of establishing programs to control emissions from nonroad engines used in many different applications. Nonroad categories already regulated include:

- Land-based compression ignition (CI) engines (e.g., farm and construction equipment),
- Small land-based spark-ignition (SI) engines (e.g., lawn and garden equipment, string trimmers).
- Marine engines (outboards, personal watercraft, CI commercial, CI engines <37kW),
- Locomotive engines.

On December 7, 2000, EPA issued an Advance Notice of Proposed Rulemaking (ANPRM). As discussed in the ANPRM, the proposal under development will be a continuation of the process of establishing standards for nonroad engines and vehicles, as required by CAA section 213(a)(3). If, as expected, standards for these engines and vehicles are established, essentially all new nonroad engines will be required to meet emissions control requirements. The proposal being developed covers compression-ignition recreational marine engines. It also covers several nonroad spark ignition (SI) engine applications, as follows:

- Land-based recreational engines (for example, engines used in snowmobiles, off-highway motorcycles, and all-terrain vehicles (ATVs)),
- Marine sterndrive and inboard (SD/I) engines and boats powered by SI marine engines,[168]
- Land-based engines rated over 19 kW (Large SI) (for example, engines used in forklifts); this category includes auxiliary marine engines, which are not used for propulsion.

EPA found that the nonroad engines described above cause or contribute to air quality nonattainment in more than one ozone or carbon monoxide (CO) nonattainment area.[169] CAA section 213 (a)(3) requires EPA to establish standards that achieve the greatest degree of emissions reductions achievable taking cost and other factors into account. EPA plans to propose emissions standards and related programs consistent with the requirements of the Act.

In addition to proposing standards for the nonroad vehicles and engines noted above, EPA also intends to review EPA requirements for highway motorcycles. The emissions standards for highway motorcycles were established twenty-three years ago. These standards allow motorcycles to emit about 100 times as much per mile as new cars and light trucks. California recently adopted new emissions standards for highway motorcycles, and new standards and testing cycles are being considered internationally. There may be opportunities to reduce emissions in a cost-effective way.

The program under consideration will cover engines and vehicles that vary in design and use, and many readers may only be interested in one or two of the applications. There are various ways EPA could group the engines and present information. For purposes of the proposed rule EPA has chosen to group engines by common applications (e.g, recreational land-based engines, marine engines, large spark ignition engines used in commercial applications).

3. Summary of Regulated Small Entities

The small entities directly regulated by this proposed rule are the following:

a. Recreational Vehicles (ATVs, snowmobiles, and off-highway motorcycles). The ATV sector has the broadest assortment of manufacturers. There are seven companies representing over 95 percent of total domestic ATV sales. The remaining 5 percent come from importers who tend to import inexpensive, youth-oriented ATVs from China and other Asian nations. We have identified 21 small companies that offer off-road motorcycles, ATVs, or both products. Annual unit sales for these companies can range from a few hundred to several thousand units per year.

Based on available industry information, four major manufacturers, Arctic Cat, Bombardier (also known as Ski-Doo), Polaris, and Yamaha, account for over 99 percent of all domestic snowmobile sales. The remaining one percent comes from very small manufacturers who tend to specialize in unique and high performance designs. We have identified three small manufacturers of snowmobiles and one potential small manufacturer who hopes to produce snowmobiles within the next year.

Two of these manufacturers (Crazy Mountain and Fast), plus the potential newcomer (Redline) specialize in high performance versions of standard recreational snowmobile types (i.e., travel and mountain sleds). The other manufacturer (Fast Trax) produces a unique design, which is a scooter-like snowmobile designed to be ridden standing up. Most of these manufacturers build less than 50 units per year.

b. Highway Motorcycles. Of the numerous manufacturers supplying the U.S. market for highway motorcycles, Honda, Harley Davidson, Yamaha, Kawasaki, Suzuki, and BMW are the largest, accounting for 95 percent or more of the total U.S. sales. All of these companies except Harley-Davidson and BMW also manufacture off-road motorcycles and ATVs for the U.S. market. Harley-Davidson is the only company manufacturing highway motorcycles exclusively in the U.S. for the U.S. market.

Since highway motorcycles have had to meet emission standards for the last

[166] ''Nonroad Engine and Vehicle Emission Study—Report and Appendices,'' EPA–21A–201, November 1991 (available in Air docket A–91–24). It is also available through the National Technical Information Service, referenced as document PB 92–126960.

[167] 59 FR 31306 (July 17, 1994).

[168] As a shorthand notation in this document, we are using ''recreational marine engines'' to mean recreational marine diesel engines and all gasoline SD/I engines, even though some SD/I applications could be commercial. We are similarly using ''recreational boats'' to mean boats powered by recreational marine diesel engines as well as all boats powered by gasoline engines, even though some gasoline engine-powered boats may be commercial.

[169] See Final Finding, ''Control of Emissions from New Nonroad Spark-Ignition Engines Rated above 19 Kilowatts and New Land-Based Recreational Spark-Ignition Engines'' elsewhere in today's **Federal Register** for EPA's finding for Large SI engines and recreational vehicles. EPA's findings for marine engines are contained in 61 FR 52088 (October 4, 1996) for gasoline engines and 64 FR 73299 (December 29, 1999) for diesel engines.

twenty years, EPA has good information on the number of companies that manufacture or market highway motorcycles for the U.S. market in each model year. In addition to the big six manufacturers noted above, EPA finds as many as several dozen more companies that have operated in the U.S. market in the last couple of model years. Most of these are U.S. companies that are either manufacturing or importing motorcycles, although a few are U.S. affiliates of larger companies in Europe or Asia. Some of the U.S. manufacturers employ only a few people and produce only a handful of custom motorcycles per year, while others may employ several hundred and produce up to several thousand motorcycles per year.

c. Marine Vessels. Marine vessels include the boat, engine, and fuel system. The evaporative emission controls discussed above may affect the boat builders and/or the fuel tank manufacturers. Exhaust emission controls including NTE requirements, as addressed in the August 29, 1999 SBAR Panel Report, would affect the engine manufacturers and may affect boat builders.

EPA has less precise information about recreational boat builders than is available about engine manufacturers. EPA has utilized several sources, including trade associations and Internet sites when identifying entities that build and/or sell recreational boats. EPA has also worked with an independent contractor to assist in the characterization of this segment of the industry. Finally, EPA has obtained a list of nearly 1,700 boat builders known to the U.S. Coast Guard to produce boats using engines for propulsion. At least 1,200 of these companies install engines that use gasoline fueled engines and would therefore be subject to the evaporative emission control program discussed above. More than 90% of the companies identified so far would be considered small businesses as defined by SBA. EPA continues to develop a more complete picture of this segment of the industry and will provide additional information as it becomes available.

Based on information supplied by a variety of recreational boat builders, fuel tanks for boats using SI marine engines are usually purchased from fuel tank manufacturers. However, some boat builders construct their own fuel tanks. The boat builder provides the specifications to the fuel tank manufacturer who helps match the fuel tank for a particular application. It is the boat builder's responsibility to install the fuel tank and connections into their vessel design. For vessels designed to be used with small outboard engines, the boat builder may not install a fuel tank; therefore, the end user would use a portable fuel tank with a connection to the engine.

EPA has determined that total sales of tanks for gasoline marine applications is approximately 550,000 units per year. The market is broken into manufacturers that produce plastic tanks and manufacturers that produce aluminum tanks. EPA has determined that there are at least seven companies that make plastic fuel tanks with total sales of approximately 440,000 units per year. EPA has determined that there at least four companies that make aluminum fuel tanks with total sales of approximately 110,000 units per year. All but one of these plastic and aluminum fuel tank manufacturers is a small business as defined under SBA.

EPA has determined that there are at least 16 companies that manufacture CI diesel engines for recreational vessels. Nearly 75 percent of diesel engines sales for recreational vessels in 2000 can be attributed to three large companies. Six of the 16 identified companies are considered small businesses as defined by SBA. Based on sales estimates for 2000, these six companies represent approximately 4 percent of recreational marine diesel engine sales. The remaining companies each comprise between two and seven percent of sales for 2000.

EPA has determined that there are at least 24 companies that manufacture SD/I gasoline engines (including airboats and jet boats) for recreational vessels. Seventeen of the identified companies are considered small businesses as defined by SBA. These 17 companies represent approximately 6 percent of recreational gasoline marine engines sales for 2000. Approximately 70–80 percent of gasoline SD/I engines manufactured in 2000 can be attributed to one company. The next largest company is responsible for about 10–20 percent of 2000 sales.

d. Large Spark Ignition Engines. EPA is aware of one engine manufacturer of Large SI engines that qualifies as a small business. This company plans to produce engines that meet the standards adopted by CARB in 2004, with the possible exception of one engine family. If EPA adopts long-term standards, this would require manufacturers to do additional calibration and testing work. If EPA adopts new test procedures (including transient operation), there may also be a cost associated with upgrading test facilities.

4. Potential Reporting, Record Keeping, and Compliance

For any emission control program, EPA must have assurances that the regulated engines will meet the standards. Historically, EPA programs have included provisions placing manufacturers responsible for providing these assurances. The program that EPA is considering for manufacturers subject to this proposal may include testing, reporting, and record keeping requirements. Testing requirements for some manufacturers may include certification (including deterioration testing), and production line testing. Reporting requirements would likely include test data and technical data on the engines including defect reporting. Manufacturers would likely have to keep records of this information.

5. Related Federal Rules

The Panel is aware of several other current Federal rules that relate to the proposed rule under development. During the Panel's outreach meeting, SERs specifically pointed to Consumer Product Safety Commission (CPSC) regulations covering ATVs, and noted that they may be relevant to crafting an appropriate definition for a competition exclusion in this category. The Panel recommends that EPA continue to consult with the CPSC in developing a proposed and final rule in order to better understand the scope of the Commission's regulations as they may relate to the competition exclusion.

Other SERs, representing manufacturers of marine engines, noted that the U.S. Coast Guard regulates vessel tanks, most notably tank pressure and anti-siphoning requirements for carburetted engines. Tank manufacturers would have to take these requirements into account in designing evaporative control systems. The Panel recommends that EPA continue to work with the Coast Guard to evaluate the safety implications of any proposed evaporative emissions standards and to avoid interference with Coast Guard safety regulations.

The Panel is also aware of other Federal rules that relate to the categories that EPA would address with the proposed rule, but are not likely to affect policy considerations in the rule development process. For example, there are now EPA noise standards covering off-road motorcycles; however, EPA expects that most emission control devices are likely to reduce, rather than increase, noise, and that therefore the noise standards are not likely to be important in developing a proposed rule.

OTAQ is currently developing a proposal that would revise the rule assigning fees to be paid by parties required to certify engines in return for continuing Government oversight and testing. Among other options, EPA could propose to extend the fee structure to several classes of non-road engines for which requirements are being established for the first time under the Recreation Rule. The Panel understands that EPA will carefully examine the potential impacts of the Fees Rule on small businesses. The Panel also notes that EPA's Office of Air Quality, Planning, and Standards (OAQPS) is preparing a Maximum Achievable Control Technology (MACT) standard for Engine Testing Facilities, which is a related matter.

6. Significant Panel Findings

The Panel considered a wide range of options and regulatory alternatives for providing small businesses with flexibility in complying with the proposed emissions standards and related requirements. As part of the process, the Panel requested and received comment on several ideas for flexibility that were suggested by SERs and Panel members. The major options recommended by the Panel are summarized below. The complete set of recommendations can be found in Section 9 of the Panel's full Report.

Many of the flexible approaches recommended by the Panel can be applied to several of the equipment categories that would potentially be affected by the proposed rule EPA is developing. These approaches are identified in Table 1. *First Tier Flexibilities:* Based on consultations with SERs, the Panel believes that the first four provisions in Table 1 are likely to provide the greatest flexibility for many small entities. These provisions are likely to be most valuable because they either provide more time for compliance (e.g., additional leadtime and hardship provisions) or allow for certification of engines based on particular engine designs or certification to other EPA programs. *Second Tier Flexibilities:* The remaining four approaches have the potential to reduce near-term and even long-term costs once a small entity has a product it is preparing to certify. These are important in that the costs of testing multiple engine families, testing a fraction of the production line, and/or developing deterioration factors can be significant. Small businesses could also meet an emission standard on average or generate credits for producing engines which emit at levels below the standard; these credits could then be sold to other manufacturers for compliance or banked for use in future model years.

During the consultation process, it became evident that, in a few situations, it could be helpful to small entities if unique provisions were available. Five such provisions are described below.

a. Snowmobiles. The Panel recommends EPA seek comment on a provision which would allow small snowmobile manufacturers to petition EPA for a relaxed standard for one or more engine families, up to 300 engines per year, until the family is retired or modified, if such a standard is justifiable based on the criteria described in the Panel report.

b. ATVs and Off-road Motorcycles. The Panel recommends that the hardship provision for ATVs and off-road motorcycles allow hardship relief to be reviewed annually for a period that EPA anticipates will likely be no more than two years in order for importers to obtain complying products.

c. Large SI. The Panel recommends that small entities be granted the flexibility initially to reclassify a small number of their small displacement engines into EPA's small spark-ignition engine program (40 CFR 90). Small entities would be allowed to use those requirements in lieu of the requirements EPA intends to propose for large entities.

d. Marine Vessel Tanks. Most of this sector involves small fuel tank manufacturers and small boat builders. The Panel recommends that the program be structured with longer lead times and an early credit generation program to enable the fuel tank manufacturers to implement controls on tanks on a schedule consistent with their normal turnover of fuel tank molds.

e. Highway Motorcycles. The California Air Resources Board (CARB) has found that California's Tier 2 standard is potentially infeasible for small manufacturers. Therefore, the Panel recommends that EPA delay making decisions on the applicability to small businesses of Tier 2 or other such revisions to the federal regulations until California's 2006 review is complete.

7. Summary of SBREFA Process and Panel Outreach

As required by section 609(b) of the RFA, as amended by SBREFA, EPA conducted outreach to small entities and convened a Small Business Advocacy Review Panel to obtain advice and recommendations of representatives of the small entities that potentially would be subject to the rule's requirements.

On May 3, 2001, EPA's Small Business Advocacy Chairperson convened this Panel under Section 609(b) of the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA). In addition to the Chair, the Panel consisted of the Director of the Assessment and Standards Division (ASD) within EPA's Office of Transportation and Air Quality, the Chief Counsel for Advocacy of the Small Business Administration, and the Deputy Administrator of the Office of Information and Regulatory Affairs within the Office of Management and Budget. As part of the SBAR process, the Panel met with small entity representatives (SERs) to discuss the potential emission standards and, in addition to the oral comments from SERs, the Panel solicited written input. In the months preceding the Panel process, EPA conducted outreach with small entities from each of the five sectors as described above. On May 18, 2001, the Panel distributed an outreach package to the SERs. On May 30 and 31, 2001, the Panel met with SERs to hear their comments on preliminary alternatives for regulatory flexibility and related information. The Panel also received written comments from the SERs in response to the discussions at this meeting and the outreach materials. The Panel asked SERs to evaluate how they would be affected under a variety of regulatory approaches, and to provide advice and recommendations regarding early ideas for alternatives that would provide flexibility to address their compliance burden.

SERs representing companies in each of the sectors addressed by the Panel raised concerns about the potential costs of complying with the rules under development. For the most part, their concerns were focused on two issues: (1) The difficulty (and added cost) that they would face in complying with certification requirements associated with the standards EPA is developing, and (2) the cost of meeting the standards themselves. SERs observed that these costs would include the opportunity cost of deploying resources for research and development, expenditures for tooling/retooling, and the added cost of new engine designs or other parts that would need to be added to equipment in order to meet EPA emission standards. In addition, in each category, the SERs noted that small manufacturers (and in the case of one category, small importers) have fewer resources and are therefore less well equipped to undertake these new activities and expenditures. Furthermore, because their product lines tend to be smaller,

any additional fixed costs must be recovered over a smaller number of units. Thus, absent any provisions to address these issues, new emission standards are likely to impose much more significant adverse effects on small entities than on their larger competitors.

The Panel discussed each of the issues raised in the outreach meetings and in written comments by the SERs. The Panel agreed that EPA should consider the issues raised by the SERs and that it would be appropriate for EPA to propose and/or request comment on various alternative approaches to address these concerns. The Panel's key discussions centered around the need for and most appropriate types of regulatory compliance alternatives for small businesses. The Panel considered a variety of provisions to reduce the burden of complying with new emission standards and related requirements. Some of these provisions would apply to all companies (e.g., averaging, banking, and trading), while others would be targeted at the unique circumstances faced by small businesses. A complete discussion of the regulatory alternatives recommended by the Panel can be found in the Final Panel Report. Copies of the Final Report can be found in the docket for this rulemaking or at *www.epa.gov/sbrefa.* Summaries of the Panel's recommended alternatives for each of the sectors subject to this action can be found in the respective sections of the preamble.

As required by section 609(b) of the RFA, as amended by SBREFA, EPA also conducted outreach to small entities and convened a Small Business Advocacy Review Panel to obtain advice and recommendations of representatives of the small entities that potentially would be subject to the rule's requirements. EPA's Small Business Advocacy Chairperson convened this on May 3, 2001. In addition to the Chair, the Panel consisted of the Director of the Assessment and Standards Division (ASD) within EPA's Office of Transportation and Air Quality, the Chief Counsel for Advocacy of the Small Business Administration, and the Deputy Administrator of the Office of Information and Regulatory Affairs within the Office of Management and Budget.

The proposal being developed covers diesel engines used in recreational marine applications. It also covers several nonroad spark ignition (SI) engine applications, as follows:

- Land-based recreational engines (for example, engines used in snowmobiles, off-highway motorcycles, and all-terrain vehicles (ATVs)),
- Marine sterndrive and inboard (SD/I) engines and boats powered by SI marine engines,
- Land-based engines rated over 19 kW (Large SI) (for example, engines used in forklifts); this category includes auxiliary marine engines, which are not used for propulsion.

In addition to the nonroad vehicles and engines noted above, EPA also intends to update EPA requirements for highway motorcycles. Finally, the proposal being developed included evaporative emission control requirements for gasoline fuel tanks and systems used on marine vessels.

The Panel met with Small Entity Representatives (SERs) to discuss the potential emissions standards and, in addition to the oral comments from SERs, the Panel solicited written input. In the months preceding the Panel process, EPA conducted outreach with small entities from each of the five sectors as described above. On May 18, 2001, the Panel distributed an outreach package to the SERs. On May 30 and 31, 2001, the Panel met with SERs to hear their comments on preliminary options for regulatory flexibility and related information. The Panel also received written comments from the SERs in response to the discussions at this meeting and the outreach materials. The Panel asked SERs to evaluate how they would be affected under a variety of regulatory approaches, and to provide advice and recommendations regarding early ideas to provide flexibility. See Section 8 of the Panel Report for a complete discussion of SER comments, and Appendices A and B for summaries of SER oral comments and SER written comments.

Consistent with the RFA/SBREFA requirements, the Panel evaluated the assembled materials and small-entity comments on issues related to the elements of the IRFA. A copy of the Panel report is included in the docket for this proposed rule. The following are Panel recommendations adopted by the Agency. Please note *all* Panel recommendations were adopted for this proposal.

a. *Related Federal Rules.* The Panel recommends that EPA continue to consult with the CPSC in developing a proposed and final rule in order to better understand the scope of the Commission's regulations as they may relate to the competition exclusion. In addition, the Panel recommends that EPA continue to work with the Coast Guard to evaluate the safety implications of any proposed evaporative emissions standards and to avoid interference with Coast Guard safety regulations.

b. Regulatory Flexibility Alternatives. The Panel recommends that EPA consider and seek comments on a wide range of alternatives, including the flexibility options described below.

c. Large SI Engines. The Panel recommends that EPA propose several possible provisions to address concern that the new EPA standards could potentially place small businesses at a competitive disadvantage to larger entities in the industry. These provisions are described below.

Using Certification and Emissions Standards from Other EPA Programs. The Panel made several recommendations for this provision. First, the Panel recommends that EPA temporarily expand this arrangement to allow small numbers of constant-speed engines up to 2.5 liters (up to 30 kW) to be certified to the Small SI standards. Second, the Panel further recommends that EPA seek comment on the appropriateness of limiting the sales level of 300. Third, the Panel recommends that EPA request comment on the anticipated cap of 30 kW on the special treatment provisions outlined above, or whether a higher cap on power rating is appropriate. Finally, the Panel recommends that EPA propose to allow small-volume manufacturers producing engines up to 30 kW to certify to the small SI standards during the first 3 model years of the program. Thereafter, the standards and test procedures which could apply to other companies at the start of the program would apply to small businesses.

Delay of Proposed Standards. If EPA includes a second phase of standards in its proposal, the Panel recommends that EPA propose to delay the applicability of these standards to small-volume manufacturers for three years beyond the date at which they would generally apply to accommodate the possibility that small companies need to undertake further design work to adequately optimize their designs and to allow them to recover the costs associated with the Phase 1 emission standards that EPA is contemplating.

Production Line Testing. The Panel made several recommendations for this provision. First, the Panel recommends that EPA adopt provisions that allow more flexibility than is available under the California Large SI program or other EPA programs generally to address the concern that production-line testing is another area where small-volume manufacturers typically face a difficult testing burden. Second, the Panel recommends that EPA allow small-volume manufacturers to have a reduced testing rate if they have consistently good test results from

testing production-line engines. Finally, the Panel recommends that EPA allow small-volume manufacturers to use alternative low-cost testing options to show that production-line engines meet emission standards.

Deterioration Factors. The Panel recommends that EPA allow small-volume manufacturers to develop a deterioration factor based on available emissions measurements and good engineering judgement.

Hardship Provision. The Panel recommends that EPA propose two types of hardship provisions for Large SI engines. First the Panel recommends that EPA allow small businesses to petition EPA for additional lead time (e.g., up to 3 years) to comply with the standards. Second, the Panel recommends that EPA allow small businesses to apply for hardship relief if circumstances outside their control cause the failure to comply (i.e., supply contract broken by parts supplier) and if the failure to sell the subject engines would have a major impact on the company's solvency.

d. Off-Road Motorcycles and All-Terrain Vehicles (ATVs). The Panel made the following recommendations for this subcategory.

The Panel recommends that EPA propose to apply the flexibilities described below to engines produced or imported by small entities with combined off-road motorcycle and ATV annual sales of less than 5,000 units per model year.

The Panel recommends that EPA request comment on the appropriateness of the 5,000 unit per model year threshold.

The Panel recommends that EPA request comment on allowing small entities with sales in excess of 5,000 units to certify using the flexible approaches described below for a number of engines equal to their 2000 or 2001 sales level.

The Panel recommends that EPA describe and seek comment on the effect of the proposed standard on these entities, including a request for any data and/or related studies to estimate the extent to which sales of their products are likely to be reduced as a result of changes in product price that are attributable to the proposed standards.

The Panel recommends that, in the final rule, EPA assess any information received in response to this request for purposes of informing the final rule decision making process on whether additional flexibility (beyond that considered in this report) is warranted.

Additional Lead-time to Meet the Proposed Standards. First, the Panel recommends that EPA propose at least a two year delay, but seek comment on whether a larger time period is appropriate given the costs of compliance for small businesses and the relationship between importers and their suppliers. Second, the Panel recommends that EPA provide additional time for small volume manufacturers to revise their manufacturing process, and would allow importers to change their supply chain to acquire complying products. Third, the Panel recommends that EPA request comment on the appropriate length for a delay (lead-time).

Design Certification. First, the Panel recommends that EPA propose to permit small entities to use design certification. Second, the Panel recommends that EPA work with the Small Entity Representatives and other members of the industry to develop appropriate criteria for such design based certification.

Broaden Engine Families. The Panel recommends that EPA request comment on engine family flexibility and conducting design-based certification emissions testing.

Production Line Testing Waiver. The Panel recommends that EPA propose to provide small manufacturers and small importers a waiver from manufacturer production line testing. The Panel also recommends that EPA request comment on whether limits or the scope of this waiver are appropriate.

Use of Assigned Deterioration Factors During Certification. The Panel recommends that EPA propose to provide small business with the option to use assigned deterioration factors.

Using Certification and Emissions Standards from Other EPA Programs. The Panel recommends that EPA propose to provide small business with this flexibility through the fifth year of the proposed program and request comment on which of the already established standards and programs are believed to be a useful certification option for the small businesses.

Averaging, Banking, and Trading. The Panel recommends that EPA propose to provide small business with the same averaging, banking, and trading program flexibilities proposed for large manufacturers and request comment on how the provisions could be enhanced for small business to make them more useful.

Hardship Provisions. The Panel recommends that EPA propose two types of hardship program for off-road motorcycles and ATVs: (1) EPA should allow small manufacturers and small importers to petition EPA for limited additional lead-time to comply with the standards; and (2) allow small manufacturers and small importers to apply for hardship relief if circumstances outside their control cause the failure to comply (i.e. supply contract broken by parts supplier) and if failure to sell the subject engines or vehicles would have a major impact on the company's solvency.

The Panel also recommends that EPA propose both aspects of the hardship provisions for small off-road motorcycle and ATV manufacturers and importers and seek comment on the implementation provisions.

e. Marine Vessels. Burden Reduction Approaches Designed for Small Boat Builders and Fuel Tank Manufacturers.

Smooth Transition to Proposed Standards. The Panel recommends that EPA propose an approach that would implement any evaporative standards five years after a regulation for marine engines takes effect. The Panel also recommends that EPA seek comment on this five year period and on whether there are small entities whose product line is dominated by tanks that turn over at a time rate slower time than five years.

Design-Based Certification. The Panel recommends that EPA propose to grant small businesses the option of certifying to the evaporative emission performance requirements based on fuel tank design characteristics that reduce emissions. The Panel also recommends that EPA seek comment on and consider proposing an approach that would allow manufacturers to use this averaging approach with designs other than those listed in the final rule.

ABT of Emission Credits with Design-Based Certification. The Panel recommends that EPA allow manufacturers using design-based certification to generate credits. The Panel also recommends that EPA provide adequately detailed design specifications and associated emission levels for several technology options that could be used to certify.

Broadly Defined Product Certification Families. The Panel recommends that EPA take comment on the need for broadly defined emission families and how these families should be defined.

Hardship Provisions. The Panel recommends that EPA propose two types of hardship programs for marine engine manufacturers and fuel tank manufacturers: (1) Allow small businesses to petition EPA for additional lead time to comply with the standards; and (2) allow small businesses to apply for hardship relief if circumstances outside their control cause the failure to comply (i.e. supply contract broken by parts supplier) and if the failure to sell the subject fuel tanks

or boats would have a major impact on the company's solvency. The Panel also recommends that EPA work with small manufacturers to develop these criteria and how they would be used.

Burden Reduction Approaches Designed for Small Marinizers of Marine Engines with Respect to NTE Provisions. The Panel recommends that EPA propose to specifically include NTE in this design-based approach, if EPA proposes a standard that includes NTE for small marinizers.

f. Snowmobiles. Delay of Proposed Standards. The Panel recommends that EPA propose to delay the standards for small snowmobile manufacturers by two years from the date at which other manufacturers would be required to comply. The Panel also recommends that EPA propose that the emission standards for small snowmobile manufacturers be phased in over an additional two year (four years to fully implement the standard).

Design-Based Certification. The Panel recommends that EPA take comment on how a design-based certification could be applied to small snowmobile manufacturers and that EPA work with the small entities in the design and implementation of this concept.

Broader Engine Families. The Panel recommends that EPA propose a provision for small snowmobile manufactures that would use relaxed criteria for what constitutes an engine or vehicle family.

Elimination of Production Line Testing Requirements. The Panel recommends that EPA propose that small snowmobile manufacturers not be subject to production line testing requirements.

Use of Assigned DF During Certification. The Panel recommends that EPA propose to allow small snowmobile manufacturers to elect to use deterioration factors determined by EPA to demonstrate end of useful life emission levels, thus reducing development/testing burden rather than performing a durability demonstration for each engine family as part of the certification testing requirement.

Using Certification and Emission Standards from Other EPA Programs. If the manufacturer were to change the bore or stroke of the engine, it is likely that the engine would no longer qualify as emissions could increase, allow this option for small snowmobile manufacturers.

Averaging, Banking and Trading. The Panel recommends that EPA propose an averaging, banking and trading program for snowmobiles, and seek comment on additional ABT flexibilities it should consider for small snowmobile manufacturers.

Hardship Provisions. The Panel recommends that EPA propose two types of hardship programs for small snowmobile manufacturers: (1) Allow small snowmobile manufacturers to petition EPA for additional lead time to comply with the standards; and (2) allow small snowmobile manufacturers to apply for hardship relief if circumstances outside their control cause the failure to comply (i.e. supply contract broken by parts supplier) and if failure to sell the subject engines or vehicles would have a major impact on the company's solvency.

Unique Snowmobile Engines. The Panel recommends that EPA seek comment on an additional provision, which would allow a small snowmobile manufacturer to petition EPA for relaxed standards for one or more engine families. The Panel also recommends that EPA allow a provision for EPA to set an alternative standard at a level between the prescribed standard and the baseline level until the engine family is retired or modified in such a way as to increase emission and for the provision to be extended for up to 300 engines per year per manufacturer would assure it is sufficiently available for those manufacturers for whom the need is greatest. Finally, the Panel recommends that EPA seek comment on initial and deadline dates for the submission of such petitions.

g. Highway Motorcycles. The Panel recommends that EPA include the flexibilities described below for small entities with highway motorcycle annual sales of less than 3,000 units per model year (combined Class I, II, and III motorcycles) and fewer than 500 employees.

Delay of Proposed Standards. The Panel recommends that EPA propose to delay compliance with the Tier 1 standard of 1.4 g/km $HC+NO_X$ until the 2008 model year for small volume manufacturers. The Panel also recommends that EPA seek comment on whether additional time is needed for small businesses to comply with the Federal program. The Panel recommends that EPA participate with CARB in the 2006 progress review as these provisions are revisited, and delay making decisions on the applicability to small businesses of Tier 2 or other revisions to the federal regulations that are appropriate following the review. The Panel also recommends that any potential Tier 2 requirements for small manufacturer motorcycles consider potential test procedure changes arising from the ongoing World Motorcycle Test Cycle work described in the Panel Report.

Broader Engine Families. The Panel recommends that EPA deep the current existing regulations for small volume highway motorcycle manufacturers.

Exemption from Production Line Testing. The Panel recommends that EPA keep the current provisions for no mandatory production line testing requirement for highway motorcycles and allow the EPA to request production vehicles from any certifying manufacturer for testing.

Averaging, Banking, and Trading (ABT). The Panel recommends that EPA propose an ABT program for highway motorcycles.

Hardship Provisions. The Panel recommends that EPA propose two types of hardship programs for highway motorcycles: (1) Allow small businesses to petition EPA for additional lead time to comply with the standards; and (2) allow small businesses to apply for hardship relief if circumstances outside their control cause the failure to comply (i.e. supply contract broken by parts supplier) and if failure to sell the subject engines or vehicles would have a major impact on the company's solvency. The Panel also recommends that EPA request comment on the California requirements, which do not include hardship provisions.

Reduced Certification Data Submittal and Testing Requirements. The Panel recommends that EPA keep current EPA regulations allow significant flexibility for certification by manufacturers who project fewer than 10,000 unit sales of combined Class I, II, and III motorcycles.

We invite comments on all aspects of the proposal and its impacts on small entities.

C. Paperwork Reduction Act

The information collection requirements (ICR) in this proposed 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.* We will announce in a separate **Federal Register** Notice that the ICR has been submitted to OMB and will take comments on the proposed ICR at that time.

The Agency may not conduct or sponsor an information collection, and a person is not required to respond to a request for information, unless the information collection request 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. Intergovernmental Relations

1. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Public Law 104–4, establishes requirements for federal agencies to assess the effects of their regulatory actions on state, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with ''federal mandates'' that may result in expenditures to state, local, and tribal governments, in the aggregate, or to the private sector, of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if the Administrator publishes with the final rule an explanation of why that alternative was not adopted.

Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

This rule contains no federal mandates for state, local, or tribal governments as defined by the provisions of Title II of the UMRA. The rule imposes no enforceable duties on any of these governmental entities. Nothing in the rule would significantly or uniquely affect small governments.

EPA has determined that this rule contains federal mandates that may result in expenditures of more than $100 million to the private sector in any single year. EPA believes that the proposal represents the least costly, most cost-effective approach to achieve the air quality goals of the rule. The costs and benefits associated with the proposal are discussed in Section IX and in the Draft Regulatory Support Document, as required by the UMRA.

2. Consultation and Coordination With Indian Tribal Governments (Executive Order 13084)

On January 1, 2001, Executive Order 13084 was superseded by Executive Order 13175. However, the proposed rule was developed during the period when Executive Order 13084 was still in force, and so tribal considerations were addressed under Executive Order 13084. Development of the final rule will address tribal considerations under Executive Order 13175.

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, in a separately identified section of the preamble to the rule, a description of the extent of EPA's prior consultation with representatives of affected tribal governments, a summary of the nature of their concerns, 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.''

This proposal does not significantly or uniquely affect the communities of Indian Tribal governments. The proposed emission standards and other related requirements for private businesses in this proposal would have national applicability, and thus would not uniquely affect the communities of Indian Tribal Governments. Further, no circumstances specific to such communities exist that would cause an impact on these communities beyond those discussed in the other sections of this proposal. Thus, EPA's conclusions regarding the impacts from the implementation of this proposed rule discussed in the other sections are equally applicable to the communities of Indian Tribal governments. Accordingly, the requirements of Section 3(b) of Executive Order 13084 do not apply to this rule.

E. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (''NTTAA''), Public Law 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. NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This proposed rule involves technical standards. The following paragraphs describe how we specify testing procedures for engines subject to this proposal.

The International Organization for Standardization (ISO) has a voluntary consensus standard that can be used to test Large SI engines. However, the current version of that standard (ISO 8178) is applicable only for steady-state testing, not for transient testing. As described in the Draft Regulatory Support Document, transient testing is an important part of the proposed emission-control program for these engines. We are therefore not proposing to adopt the ISO procedures in this rulemaking.

Underwriters Laboratories (UL) has adopted voluntary consensus standards for forklifts that are relevant to the proposed requirements for Large SI engines. UL sets a maximum temperature specification for gasoline and, for forklifts used in certain applications, defines requirements to avoid venting from gasoline fuel tanks. We are proposing a different temperature limit, because the maximum temperature specified by UL does not prevent fuel boiling. We are proposing separate measures to address venting of gasoline vapors, because of UL's provisions to allow venting with an orifice up to 1.78 mm (0.070 inches). We believe forklifts with such a vent would have unnecessarily high evaporative emissions. If the UL standard is revised to address these technical concerns, the UL standards would appropriate to reference in our regulations. An additional concern relates to the fact that the UL requirements apply only to forklifts (and not all forklifts in the case of the restriction on vapor venting). EPA

regulations would therefore need to, at a minimum, extend any published UL standards to other engines and equipment to which the UL standards would otherwise not apply.

We are proposing to test off-highway motorcycles and all-terrain vehicles with the Federal Test Procedure, a chassis-based transient test. There is no voluntary consensus standard that would adequately address engine or vehicle operation for suitable emission measurement. Furthermore, we are interested in pursuing an engine-based test procedure for all-terrain vehicles. We would need to develop a new duty cycle for this, because there is no acceptable engine duty cycle today that would adequately represent the way these engines operate. For snowmobiles, we are proposing test procedures based on work that has been published, but not yet adopted as a voluntary consensus standard.

For recreational marine diesel engines, we are proposing the same test procedures that we have adopted for commercial marine diesel engines (with a new duty cycle appropriate for recreational applications). We are again proposing these procedures in place of the ISO 8178 standard that would apply to these engines. We believe that ISO 8178 relies too heavily on reference testing conditions. Because our test procedures need to represent in-use operation typical of operation in the field, they must be based on a range of ambient conditions. We determined that the ISO procedures are not broadly usable in their current form, and therefore should not be adopted by reference. We remain hopeful that future ISO test procedures will be developed that are usable and accurate for the broad range of testing needed, and that such procedures could then be adopted. We expect that any such development of revised test procedures will be done in accordance with ISO procedures and in a balanced and transparent manner that includes the involvement of all interested parties, including industry, U.S. EPA, foreign government organizations, state governments, and environmental groups. In so doing, we believe that the resulting procedures would be ''global'' test procedures that can facilitate the free flow of international commerce for these products.

F. Protection of Children (Executive Order 13045)

Executive Order 13045, ''Protection of Children from Environmental Health Risks and Safety Risks'' (62 FR 19885, April 23, 1997) applies to any rule that (1) is determined to be ''economically significant'' as defined under Executive Order 12866, and (2) 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 both criteria, Section 5–501 of the Order directs the Agency to 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 proposed rule is not subject to the Executive Order because it does not involve decisions on environmental health or safety risks that may disproportionately affect children.

The effects of ozone and PM on children's health were addressed in detail in EPA's rulemaking to establish the NAAQS for these pollutants, and EPA is not revisiting those issues here. EPA believes, however, that the emission reductions from the strategies proposed in this rulemaking will further reduce air toxics and the related adverse impacts on children's health.

G. Federalism (Executive Order 13132)

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

Under Section 6 of Executive Order 13132, EPA may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, and that is not required by statute, unless the Federal government provides the funds necessary to pay the direct compliance costs incurred by State and local governments, or EPA consults with State and local officials early in the process of developing the proposed regulation. EPA also may not issue a regulation that has federalism implications and that preempts State law, unless the Agency consults with State and local officials early in the process of developing the proposed regulation.

Section 4 of the Executive Order contains additional requirements for rules that preempt State or local law, even if those rules do not have federalism implications (i.e., the rules will not have substantial direct effects on the States, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government). Those requirements include providing all affected State and local officials notice and an opportunity for appropriate participation in the development of the regulation. If the preemption is not based on express or implied statutory authority, EPA also must consult, to the extent practicable, with appropriate State and local officials regarding the conflict between State law and Federally protected interests within the agency's area of regulatory responsibility.

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132.

Although Section 6 of Executive Order 13132 does not apply to this rule, EPA did consult with representatives of various State and local governments in developing this rule. EPA has also consulted representatives from STAPPA/ALAPCO, which represents state and local air pollution officials.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed rule from State and local officials.

H. Energy Effects (Executive Order 13211)

This rule is not a ''significant energy action'' as defined in Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355 (May 22, 2001)) because it is not likely to have a significant adverse effect on the supply, distribution or use of energy. The proposed standards have for their aim the reduction of emission from certain nonroad engines, and have no effect on fuel formulation, distribution, or use. Generally, the proposed program leads to reduced fuel usage due to the improvements in engine control technologies.

I. Plain Language

This document follows the guidelines of the June 1, 1998 Executive Memorandum on Plain Language in Government Writing. To read the text of

the regulations, it is also important to understand the organization of the Code of Federal Regulations (CFR). The CFR uses the following organizational names and conventions.

Title 40—Protection of the Environment

Chapter I—Environmental Protection Agency

Subchapter C—Air Programs. This contains parts 50 to 99, where the Office of Air and Radiation has usually placed emission standards for motor vehicle and nonroad engines.

Subchapter U—Air Programs Supplement. This contains parts 1000 to 1299, where we intend to place regulations for air programs in future rulemakings.

Part 1048—Control of Emissions from New, Large, Nonrecreational, Nonroad Spark-ignition Engines. Most of the provisions in this part apply only to engine manufacturers.

Part 1051—Control of Emissions from Recreational Engines and Vehicles.

Part 1065—General Test Procedures for Engine Testing. Provisions of this part apply to anyone who tests engines to show that they meet emission standards.

Part 1068—General Compliance Provisions for Engine Programs. Provisions of this part apply to everyone.

Each part in the CFR has several subparts, sections, and paragraphs. The following illustration shows how these fit together.

Part 1048
Subpart A
Section 1048.001
(a)
(b)
(1)
(2)
(i)
(ii)
(A)
(B)

A cross reference to § 1048.001(b) in this illustration would refer to the parent paragraph (b) and all its subordinate paragraphs. A reference to ''§ 1048.001(b) introductory text'' would refer only to the single, parent paragraph (b).

List of Subjects

40 CFR Part 89

Environmental protection, Administrative practice and procedure, Confidential business information, Imports, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements, Research, Vessels, Warranties.

40 CFR Part 90

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

40 CFR Parts 91 and 1051

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Imports, Labeling, Penalties, Reporting and recordkeeping requirements, Warranties.

40 CFR Parts 94

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Imports, Penalties, Reporting and recordkeeping requirements, Vessels, Warranties.

40 CFR Part 1048

Environmental protection, Administrative practice and procedure, Air pollution control, Confidential business information, Imports, Labeling, Penalties, Reporting and recordkeeping requirements, Research, Warranties.

40 CFR Part 1065

Environmental protection, Administrative practice and procedure, Reporting and recordkeeping requirements, Research.

40 CFR Part 1068

Environmental protection, Administrative practice and procedure, Confidential business information, Imports, Motor vehicle pollution, Penalties, Reporting and recordkeeping requirements, Warranties.

Dated: September 14, 2001.

Christine Todd Whitman,

Administrator.

For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations is proposed to be amended as set forth below.

PART 89—CONTROL OF EMISSIONS FROM NEW AND IN-USE NONROAD COMPRESSION-IGNITION ENGINES

1. The authority for part 89 continues to read as follows:

Authority: 42 U.S.C. 7521, 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7545, 7547, 7549, 7550, and 7601(a).

Subpart A—[Amended]

2. Section 89.2 is amended by adding definitions for ''Aircraft'' and ''Spark-ignition'' in alphabetic order and revising the definition of ''Compression-ignition'' to read as follows:

§ 89.2 Definitions.

* * * * *

Aircraft means any vehicle capable of sustained air travel above treetop heights.

* * * * *

Compression-ignition means relating to a type of reciprocating, internal-combustion engine that is not a spark-ignition engine.

* * * * *

Spark-ignition means relating to a type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle to regulate intake air flow to control power during normal operation.

* * * * *

PART 90—CONTROL OF EMISSIONS FROM NONROAD SPARK-IGNITION ENGINES AT OR BELOW 19 KILOWATTS

3. The heading to part 90 is revised to read as set forth above.

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

Authority: 42 U.S.C. 7521, 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7547, 7549, 7550, and 7601(a).

Subpart A—[Amended]

5. Section 90.1 is revised to read as follows:

§ 90.1 Applicability.

(a) This part applies to new nonroad spark-ignition engines and vehicles with gross power output at or below 19 kilowatts (kW) used for any purpose, unless we exclude them under paragraph (c) of this section.

(b) This part also applies to engines with a gross power output above 19 kW if the manufacturer uses the provisions of 40 CFR 1048.615 or 1048.145 to exempt them from the requirements of 40 CFR part 1048. Compliance with the provisions of this part is a required condition of that exemption.

(c) The following nonroad engines and vehicles are not subject to the provisions of this part:

(1) Engines used in snowmobiles, all-terrain vehicles, or off-highway motorcycles and regulated in 40 CFR part 1051. This part nevertheless applies to engines used in all-terrain vehicles or off-highway motorcycles if the manufacturer uses the provisions of 40 CFR 1051.615 to exempt them from the requirements of 40 CFR part 1051. Compliance with the provisions of this part is a required condition of that exemption.

(2) Engines used in highway motorcycles. See 40 CFR part 86, subpart E.

(3) Propulsion marine engines. See 40 CFR parts 91 and 1045. This part applies with respect to auxiliary marine engines.

(4) Engines used in aircraft. See 40 CFR part 87.

(5) Engines certified to meet the requirements of 40 CFR part 1048.

(6) Hobby engines.

(7) 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.

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

(e) 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.

6. Section 90.2 is amended by adding a new paragraph (c) to read as follows:

§ 90.2 Effective dates.

* * * * *

(c) Notwithstanding paragraphs (a) and (b) of this section, engines used in recreational vehicles with engine rated speed greater than or equal to 5,000 rpm and with no installed speed governor are not subject to the provisions of this part through the 2005 model year. Starting with the 2006 model year, all the requirements of this part apply to engines used in these vehicles if they are not included in the scope of 40 CFR part 1051.

7. Section 90.3 is amended by adding definitions for ''Aircraft'', ''Hobby engines'', ''Marine engine'', ''Marine vessel'', ''Recreational'', and ''United States'' in alphabetical order, to read as follows:

§ 90.3 Definitions.

* * * * *

Aircraft means any vehicle capable of sustained air travel above treetop heights.

* * * * *

Hobby engines means engines used in reduced-scale models of vehicles that are not capable of transporting a person (for example, model airplanes).

Marine engine means an engine that someone installs or intends to install on a marine vessel.

Marine vessel means a vehicle that is capable of operation in water but is not capable of operation out of water. Amphibious vehicles are not marine vessels.

* * * * *

Recreational means, for purposes of this part, relating to a vehicle intended by the vehicle manufacturer to be operated primarily for pleasure. Note that snowmobiles, all-terrain vehicles, and off-highway motorcycles are recreational vehicles that we regulate under 40 CFR part 1051.

* * * * *

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, the U.S. Virgin Islands, and the Trust Territory of the Pacific Islands.

* * * * *

Subpart B—[Amended]

8. Section 90.103 is amended by redesignating paragraph (a)(2)(v) as paragraph (a)(2)(vi) and adding a new paragraph (a)(2)(v) to read as follows:

§ 90.103 Exhaust emission standards.

(a) * * *

(2) * * *

(v) The engine must be used in a recreational application, with a combined total vehicle dry weight under 20 kilograms;

* * * * *

PART 91—CONTROL OF EMISSIONS FROM MARINE SPARK-IGNITION ENGINES

9. The authority for part 91 continues to read as follows:

Authority: 42 U.S.C. 7521, 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7547, 7549, 7550, and 7601(a).

Subpart A—[Amended]

10. Section 91.3 is amended by adding the definition for United States in alphabetical order to read as follows:

§ 91.3 Definitions.

* * * * *

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, the U.S. Virgin Islands, and the Trust Territory of the Pacific Islands.

* * * * *

Subpart E—[Amended]

11. Section 91.419 is amended in paragraph (b) by revising the equations for M_{HCexh} and M_{exh} to read as follows:

§ 91.419 Raw emission sampling calculations.

* * * * *

(b) * * *

$M_{HCexh}=12.01+1.008\times\alpha$

* * * * *

$$M_{exh}=\frac{M_{HC_{exh}}\times WHC}{10^6}+\frac{28.01\times WCO}{10^2}+\frac{44.1\times WCO_2}{10^2}+\frac{46.01\times WNO_x}{10^6}+\frac{2.016\times WH_2}{10^2}+18.01\times(1-K)+28.01\times\frac{\left[100-\frac{WHC}{10^4}-WCO-WCO_2-\frac{WNO_X}{10^4}-WH_2-100\times(1-K)\right]}{10^2}$$

* * * * *

Subpart G—[Amended]

12. Appendix A to Subpart G of part 91 is amended by revising Table 1 to read as follows:

Appendix A to Subpart G of Part 91—Sampling Plans for Selective Enforcement Auditing of Marine Engines

TABLE 1.—SAMPLING PLAN CODE LETTER

Annual engine family sales	Code letter
20–50	AA1 [1]
20–99	A [1]
100–299	B
300–499	C
500 or greater	D

[1] A manufacturer may optionally use either the sampling plan for code letter ''AA'' or sampling plan for code letter ''A'' for Selective Enforcement Audits of engine families with annual sales between 20 and 50 engines. Additional, the manufacturers may switch between these plans during the audit.

* * * * *

Subpart I—[Amended]

13. Section 91.803 is amended by revising paragraph (a) to read as follows:

§ 91.803 Manufacturer in-use testing program.

(a) EPA shall annually identify engine families and those configurations within families which the manufacturers must then subject to in-use testing. For each model year, EPA may identify the following number of engine families for testing, based on the manufacturer's total number of engine families to which this subpart is applicable produced in that model year:

(1) For manufactures with three or fewer engine families, EPA may identify a single engine family.

(2) For manufacturers with four or more engine families, EPA may identify a number of engine families that is no greater than twenty-five percent of the manufacturer's total number of engine families.

* * * * *

PART 94—CONTROL OF EMISSIONS FROM MARINE COMPRESSION-IGNITION ENGINES

14. The heading to part 94 is revised to read as set forth above.

15. The authority citation for part 94 continues to read as follows:

Authority: 42 U.S.C. 7522, 7523, 7524, 7525, 7541, 7542, 7543, 7545, 7547, 7549, 7550 and 7601(a).

Subpart A—[Amended]

16. Section 94.1 is revised to read as follows:

§ 94.1 Applicability.

(a) Except as noted in paragraphs (b) and (c) of this section, the provisions of this part apply to manufacturers (including post-manufacture marinizers and dressers), rebuilders, owners and operators of:

(1) Marine engines that are compression-ignition engines manufactured (or that otherwise become new) on or after January 1, 2004;

(2) Marine vessels manufactured (or that otherwise become new) on or after January 1, 2004 and which include a compression-ignition marine engine.

(b) Notwithstanding the provision of paragraph (c) of this section, the requirements and prohibitions of this part do not apply to three types of marine engines:

(1) Category 3 marine engines;

(2) Marine engines with rated power below 37 kW; or

(3) Marine engines on foreign vessels.

(c) The provisions of Subpart L of this part apply to everyone with respect to the engines identified in paragraph (a) of this section.

17. Section 94.2 is amended by revising paragraph (b) introductory text, removing the definition for ''Commercial marine engine'', revising definitions for ''Compression-ignition'', ''Designated officer'', ''Passenger'', ''Recreational marine engine'', ''Recreational vessel'', and ''United States'', and adding new definitions for ''Commercial'', ''Small-volume boat builder'', ''Small-volume manufacturer'', and ''Spark-ignition'' in alphabetical order to read as follows:

§ 94.2 Definitions.

* * * * *

(b) As used in this part, all terms not defined in this section shall have the meaning given them in the Act:

* * * * *

Commercial means relating to an engine or vessel that is not a recreational marine engine or a recreational vessel.

* * * * *

Compression-ignition means relating to an engine that is not a *spark-ignition* engine.

* * * * *

Designated Officer means the Manager, Engine Programs Group (6403–J), U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., Washington, DC 20460.

* * * * *

Passenger has the meaning given by 46 U.S.C. 2101 (21) and (21a). This generally means that a passenger is a person that pays to be on the vessel.

* * * * *

Recreational marine engine means a Category 1 propulsion marine engine that is intended by the manufacturer to be installed on a recreational vessel, and which is permanently labeled as follows: ''THIS ENGINE IS CATEGORIZED AS A RECREATIONAL MARINE ENGINE UNDER 40 CFR PART 94. INSTALLATION OF THIS ENGINE IN ANY NONRECREATIONAL VESSEL IS A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.''.

Recreational vessel has the meaning given in 46 U.S.C 2101 (25), but excludes ''passenger vessels'' and ''small passenger vessels'' as defined by 46 U.S.C. 2101 (22) and (35) and excludes vessels used solely for competition. In general, for this part, ''recreational vessel'' means a vessel that is intended by the vessel manufacturer to be operated primarily for pleasure or leased, rented or chartered to another for the latter's pleasure, excluding the following vessels:

(1) Vessels of less than 100 gross tons that carry more than 6 passengers (as defined in this section).

(2) Vessels of 100 gross tons or more that carry one or more passengers (as defined in this section).

(3) Vessels used solely for competition.

* * * * *

Small-volume boat builder means a boat manufacturer with fewer than 500 employees and with annual U.S.-directed production of fewer than 100 boats. For manufacturers owned by a parent company, these limits apply to the combined production and number of employees of the parent company and all its subsidiaries.

Small-volume manufacturer means a manufacturer with annual U.S.-directed production of fewer than 1,000 internal combustion engines (marine and nonmarine). For manufacturers owned by a parent company, the limit applies to the production of the parent company and all its subsidiaries.

Spark-ignition means relating to a type of engine with a spark plug (or other sparking device) and with operating characteristics significantly similar to the theoretical Otto combustion cycle. Spark-ignition engines usually use a throttle to regulate

intake air flow to control power during normal operation.

* * * * *

United States means the States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, Guam, American Samoa, the U.S. Virgin Islands, and the Trust Territory of the Pacific Islands.

* * * * *

18. Section 94.7 is amended by revising paragraph (e) to read as follows:

§ 94.7 General standards and requirements.

* * * * *

(e) Electronically controlled engines subject to the emission standards of this part shall broadcast on engine's controller area networks engine torque (as percent of maximum at that speed) and engine speed.

19. Section 94.8 is amended by revising paragraphs (a), (e), (f) introductory text, and (f)(1) to read as follows:

§ 94.8 Exhaust emission standards.

(a) Exhaust emissions from marine compression-ignition engines shall not exceed the applicable exhaust emission standards contained in Table A–1 as follows:

TABLE A–1.—PRIMARY TIER 2 EXHAUST EMISSION STANDARDS (g/kW-hr)

Engine size liters/cylinder, rated power	Category	Model year[a]	THC+ NO_x g/kW-hr	CO g/kW-hr	PM g/kW-hr
disp. < 0.9 and power ≥ 37 kW	Category 1 Commercial Category Recreational 1	2005 2007	7.5 7.5	5.0 5.0	0.40 0.40
0.9 ≤ disp. < 1.2 all power levels	Category 1 Commercial Category 1 Recreational	2004 2006	7.2 7.2	5.0 5.0	0.30 0.30
1.2 ≤ disp. < 2.5 all power levels	Category 1 Commercial Category 1 Recreational	2004 2006	7.2 7.2	5.0 5.0	0.20 0.20
2.5 ≤ disp. < 5.0 all power levels	Category 1 Commercial Category 1 Recreational	2007 2009	7.2 7.2	5.0 5.0	0.20 0.20
5.0 ≤ disp. < 15.0 all power levels	Category 2	2007	7.8	5.0	0.27
15.0 ≤ disp. < 20.0 power < 3300 kW	Category 2	2007	8.7	5.0	0.50
15.0 ≤ disp. < 20.0 power ≥ 3300 kW	Category 2	2007	9.8	5.0	0.50
20.0 ≤ disp. < 25.0 all power levels	Category 2	2009	9.8	5.0	0.50
25.0 ≤ disp. < 30.0	Category 2	2007	11.0	5.0	0.50

[a] The model years listed indicate the model years for which the specified standards start.

* * * * *

(e) Exhaust emissions from propulsion engines subject to the standards (or FELs) in paragraph (a), (c), or (f) of this section shall not exceed:

(1) *Commercial marine engines.* (i) 1.20 times the applicable standards (or FELs) when tested in accordance with the supplemental test procedures specified in § 94.106 at loads greater than or equal to 45 percent of the maximum power at rated speed or 1.50 times the applicable standards (or FELs) at loads less than 45 percent of the maximum power at rated speed.

(ii) As an option, the manufacturer may choose to comply with limits of 1.25 times the applicable standards (or FELs) when tested over the whole power range in accordance with the supplemental test procedures specified in § 94.106, instead of the limits in paragraph (e)(1)(i) of this section.

(2) *Recreational marine engines.* (i) 1.20 times the applicable standards (or FELs) when tested in accordance with the supplemental test procedures specified in § 94.106 at loads greater than or equal to 45 percent of the maximum power at rated speed and speeds less than 95 percent of maximum test speed, or 1.50 times the applicable standards (or FELs) at loads less than 45 percent of the maximum power at rated speed, or 1.50 times the applicable standards (or FELs) at any loads for speeds greater than or equal to 95 percent of the maximum test speed.

(ii) As an option, the manufacturer may choose to comply with limits of 1.25 times the applicable standards (or FELs) when tested over the whole power range in accordance with the supplemental test procedures specified in § 94.106, instead of the limits in paragraph (e)(2)(i) of this section.

(f) The following defines the requirements for low emitting Blue Sky Series engines:

(1) *Voluntary standards.* Engines may be designated ''Blue Sky Series'' engines through the 2010 model year by meeting the voluntary standards listed in Table A–2, which apply to all certification and in use testing, as follows:

TABLE A–2.—VOLUNTARY EMISSION STANDARDS (g/kW-hr)

Rated brake power (kW)	THC+ NO_x	PM
Power ≥ 37 kW, and displ.<0.9	4.0	0.24
0.9≤displ.<1.2	4.0	0.18
1.2≤displ.<2.5	4.0	0.12
2.5≤displ.<5	5.0	0.12
5≤displ.<15	5.0	0.16
15 ≤ disp. < 20, and power < 3300 kW	5.2	0.30
15 ≤ disp. < 20, and power ≥ 3300 kW	5.9	0.30
20 ≤ disp. < 25	5.9	0.30
25 ≤ disp. < 30	6.6	0.30

* * * * *

20. Section 94.9 is amended by revising paragraphs (a) introductory text and (a)(1) to read as follows:

§ 94.9 Compliance with emission standards.

(a) The general standards and requirements in § 94.7 and the emission standards in § 94.8 apply to each new engine throughout its useful life period. The useful life is specified both in years and in hours of operation, and ends when either of the values (hours of operation or years) is exceeded.

(1) The minimum useful life is:

(i) 10 years or 1,000 hours of operation for recreational Category 1 engines;

(ii) 10 years or 10,000 hours of operation for commercial Category 1 engines;

(iii) 10 years or 20,000 hours of operation for Category 2 engines.

* * * * *

21. Section 94.12 is amended by revising the introductory text and paragraphs (a) and (b)(1) and adding a new paragraph (f) to read as follows:

§ 94.12 Interim provisions.

This section contains provisions that apply for a limited number of calendar years or model years. These provisions apply instead of the other provisions of this part.

(a) *Compliance date of standards.* Certain companies may delay compliance with emission standards. Companies wishing to take advantage of this provision must inform the Designated Officer of their intent to do so in writing before the date that compliance with the standards would otherwise be mandatory.

(1) Post-manufacture marinizers may elect to delay the model year of the Tier 2 standards for commercial engines as specified in § 94.8 by one year for each engine family.

(2) Small-volume manufacturers may elect to delay the model year of the Tier 2 standards for recreational engines as specified in § 94.8 by five years for each engine family.

(b) *Early banking of emission credits.* (1) A manufacturer may optionally certify engines manufactured before the date the Tier 2 standards take effect to earn emission credits under the averaging, banking, and trading program. Such optionally certified engines are subject to all provisions relating to mandatory certification and enforcement described in this part. Manufacturers may begin earning credits for recreational engines on [date 30 days after publication of the final rule in the **Federal Register**].

* * * * *

(f) *Flexibility for small-volume boat builders.* Notwithstanding the other provisions of this part, manufacturers may sell uncertifed recreational engines to small-volume boat builders during the first five years for which the emission standards in § 94.8 apply, subject to the following provisions:

(1) The U.S.-directed production volume of boats from any small-volume boat builder using uncertified engines during the total five-year period may not exceed 80 percent of the manufacturer's average annual production for the three years prior to the general applicability of the recreational engine standards in § 94.8, except as allowed in paragraph (f)(2) of this section.

(2) Small-volume boat builders may exceed the production limits in paragraph (f)(1) of this section, provided it does not exceed 20 boats during the five-year period or 10 boats in any single calendar year. This does not apply to boats powered by engines with displacement greater than 2.5 liters per cylinder.

(3) Small-volume boat builders must keep records of all the boats and engines produced under this paragraph (f), including boat and engine model numbers, serial numbers, and dates of manufacture. Records must also include information verifying compliance with the limits in paragraph (f)(1) or (f)(2) of this section. Keep these records until at least two full years after you no longer use the provisions in this paragraph (f).

Subpart B—[Amended]

22. Section 94.104 is amended by redesignating paragraph (c) as paragraph (d) and adding a new paragraph (c) to read as follows:

§ 94.104 Test procedures for Category 2 marine engines.

* * * * *

(c) Conduct testing at ambient temperatures from 13° C to 30° C.

23. Section 94.105 is amended by revising paragraph (b) text preceding Table B–1, revising ''#'' to read ''±'' in footnotes 1 and 2 in the tables in paragraphs (b), (c)(1), (c)(2), and (d)(1), and adding a new paragraph (e) to read as follows:

§ 94.105 Duty cycles.

* * * * *

(b) *General cycle.* Propulsion engines that are used with (or intended to be used with) fixed-pitch propellers, and any other engines for which the other duty cycles of this section do not apply, shall be tested using the duty cycle described in the following Table B–1:

* * * * *

(e) *Recreational.* For the purpose of determining compliance with the emission standards of § 94.8, recreational engines shall be tested using the duty cycle described in Table B–5, which follows:

TABLE B–5.—RECREATIONAL MARINE DUTY CYCLE

Mode No.	Engine speed [1] (percent of maximum test speed)	Percent of maximum test power [2]	Minimum time in mode (minutes)	Weighting factors
1	100	100	5.0	0.08
2	91	75	5.0	0.13
3	80	50	5.0	0.17
4	63	25	5.0	0.32
5	idle	0	5.0	0.30

[1] Engine speed: ± 2 percent of point.
[2] Power: ±2 percent of engine maximum value.

24. Section 94.106 is amended by revising paragraphs (b) introductory text, (b)(1) introductory text, (b)(2) introductory text, and (b)(3) introductory text and adding a new paragraph (b)(5) to read as follows:

§ 94.106 Supplemental test procedures.

* * * * *

(b) The specified Not to Exceed Zones for marine engines are defined as follows. These Not to Exceed Zones apply, unless a modified zone is established under paragraph (c) of this section.

(1) For commercial Category 1 engines certified using the duty cycle specified in § 94.105(b), the Not to Exceed zones are defined as follows:

* * * * *

(2) For Category 2 engines certified using the duty cycle specified in § 94.105(b), the Not to Exceed zones are defined as follows:

* * * * *

(3) For engines certified using the duty cycle specified in § 94.105(c)(2), the Not to Exceed zones are defined as follows:

* * * * *

(5) For recreational marine engines certified using the duty cycle specified in § 94.105(e), the Not to Exceed zones are defined as follows:

(i) The Not to Exceed zone is the region between the curves power = $1.15 \times SPD^2$ and power = $0.85 \times SPD^4$, excluding all operation below 25% of maximum power at rated speed and excluding all operation below 63% of maximum test speed.

(ii) This zone is divided into three subzones, one below 45% of maximum power at maximum test speed; one above 95% of maximum test speed; and a third area including all of the remaining area of the NTE zone.

(iii) SPD in paragraph (b)(3)(i) of this section refers to percent of maximum test speed.

(iv) See Figure B–4 for an illustration of this Not to Exceed zone as follows:

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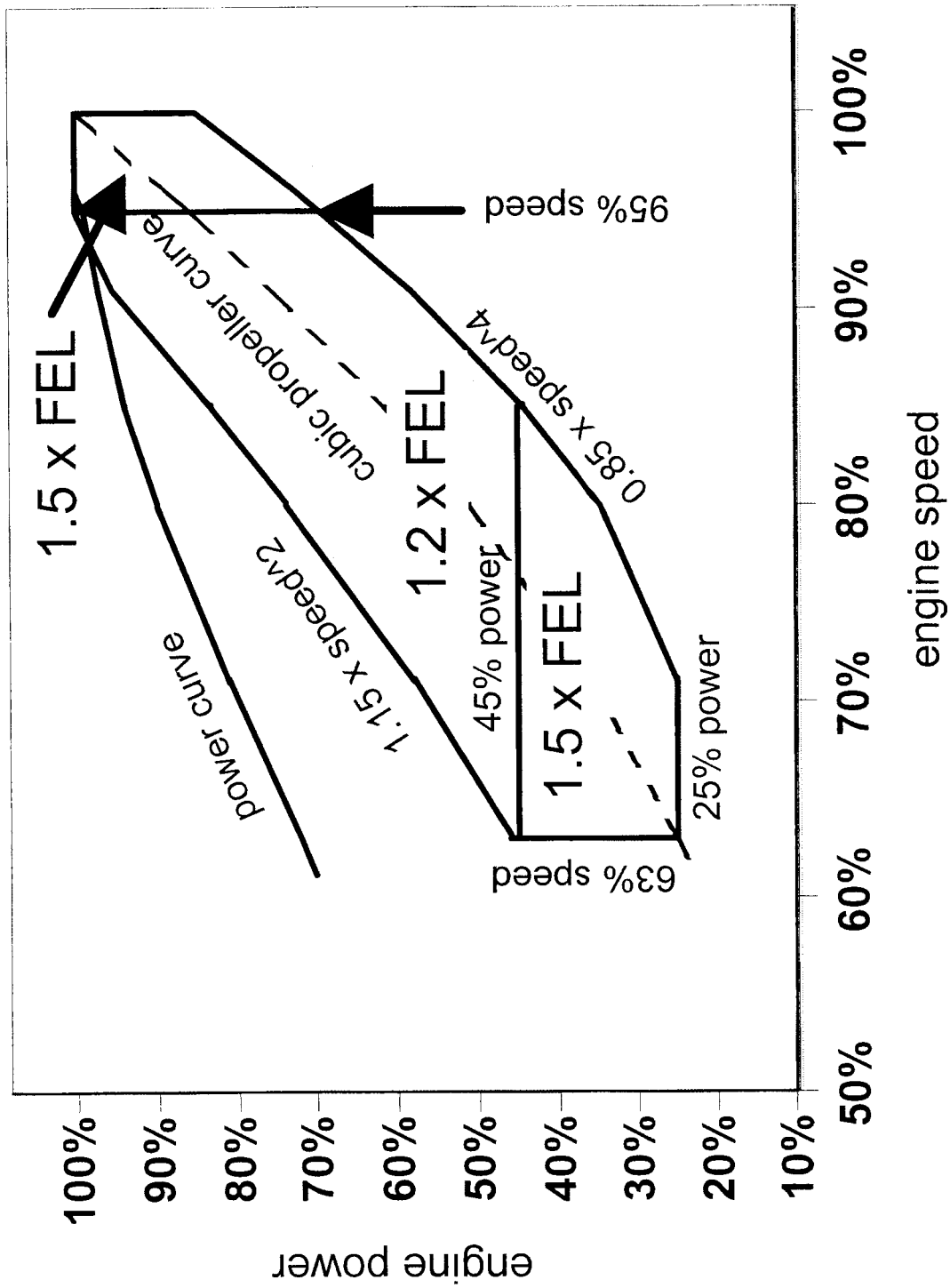

Figure B-4

BILLING CODE 6560–50–C

25. Section 94.108 is amended in paragraph (a)(1) by revising footnote 1 in Table B–5 to read as follows:

§ 94.108 Test fuels.

(a) * * * (1) * * *

TABLE B–5.—FEDERAL TEST FUEL SPECIFICATIONS

TABLE B–5.—FEDERAL TEST FUEL SPECIFICATIONS—Continued

* * * * *

[1] All ASTM procedures in this table have been incorporated by reference. See § 94.5.

* * * * *

Subpart C—[Amended]

26. Section 94.203 is amended by revising paragraphs (d)(14) and (d)(16) to read as follows:

§ 94.203 Application for certification.

* * * * *

(d) * * *

(14) A statement that all the engines included in the engine family comply with the Not To Exceed standards

specified in § 94.8(e) when operated under all conditions which may reasonably be expected to be encountered in normal operation and use; the manufacturer also must provide a detailed description of all testing, engineering analyses, and other information which provides the basis for this statement.

* * * * *

(16) A statement indicating duty-cycle and application of the engine (e.g., used to propel planing vessels, use to propel vessels with variable-pitch propellers, constant-speed auxiliary, recreational, etc.).

* * * * *

27. Section 94.204 is amended by removing ''and'' at the end of paragraph (b)(9), adding ''; and'' at the end of paragraph (b)(10), adding a new paragraph (b)(11), and revising paragraph (e) to read as follows:

§ 94.204 Designation of engine families.

* * * * *

(b) * * *

(11) Class (commercial or recreational).

* * * * *

(e) Upon request by the manufacturer, the Administrator may allow engines that would be required to be grouped into separate engine families based on the criteria in paragraph (b) or (c) of this section to be grouped into a single engine family if the manufacturer demonstrates that the engines will have similar emission characteristics; however, recreational and commercial engines may not be grouped in the same engine family. This request must be accompanied by emission information supporting the appropriateness of such combined engine families.

28. Section 94.209 is revised to read as follows:

§ 94.209 Special provisions for post-manufacture marinizers and small-volume manufacturers.

(a) *Broader engine families.* Instead of the requirements of § 94.204, an engine family may consist of any engines subject to the same emission standards. This does not change any of the requirements of this part for showing that an engine family meets emission standards. To be eligible to use the provisions of this paragraph (a), the manufacturer must demonstrate one of the following:

(1) It is a post-manufacture marinizer and that the base engines used for modification have a valid certificate of conformity issued under 40 CFR part 89 or 40 CFR part 92 or the heavy-duty engine provisions of 40 CFR part 86.

(2) It is a small-volume manufacturer.

(b) *Hardship relief.* Post-manufacture marinizers, small-volume manufacturers, and small-volume boat builders may take any of the otherwise prohibited actions identified in § 94.1103(a)(1) if approved in advance by the Administrator, subject to the following requirements:

(1) Application for relief must be submitted to the Designated Officer in writing prior to the earliest date in which the applying manufacturer would be in violation of § 94.1103. The manufacturer must submit evidence showing that the requirements for approval have been met.

(2) The conditions causing the impending violation must not be substantially the fault of the applying manufacturer.

(3) The conditions causing the impending violation must jeopardize the solvency of the applying manufacturer if relief is not granted.

(4) The applying manufacturer must demonstrate that no other allowances under this part will be available to avoid the impending violation.

(5) Any relief may not exceed one year beyond the date relief is granted.

(6) The Administrator may impose other conditions on the granting of relief including provisions to recover the lost environmental benefit.

(c) *Extension of deadlines.* Small-volume manufacturers may use the provisions of 40 CFR 1068.241 to ask for an extension of a deadline to meet emission standards. We may require that you use available base engines that have been certified to emission standards for land-based engines until you are able to produce engines certified to the requirements of this part.

29. Section 94.212 is amended by revising paragraph (b)(10) to read as follows:

§ 94.212 Labeling.

* * * * *

(b) *Engine labels.* * * *

(10) The application for which the engine family is certified. (For example: constant-speed auxiliary, variable-speed propulsion engines used with fixed-pitch propellers, recreational, etc.)

* * * * *

30. Section 94.218 is amended by adding a new paragraph (d)(2)(iv) to read as follows:

§ 94.218 Deterioration factor determination.

* * * * *

(d) * * *

(2) * * *

(iv) *Assigned deterioration factors.* Small-volume manufacturers may use deterioration factors established by EPA.

Subpart D—[Amended]

31. Section 94.304 is amended by revising paragraph (k) to read as follows:

§ 94.304 Compliance requirements.

* * * * *

(k) The following provisions limit credit exchanges between different types of engines:

(1) Credits generated by Category 1 engine families may be used for compliance by Category 1 or Category 2 engine families. Credits generated from Category 1 engine families for use by Category 2 engine families must be discounted by 25 percent.

(2) Credits generated by Category 2 engine families may be used for compliance only by Category 2 engine families.

(3) Credits may not be exchanged between recreational and commercial engines.

* * * * *

Subpart F—[Amended]

32. Section 94.501 is amended by revising paragraph (a) to read as follows:

§ 94.501 Applicability.

(a) The requirements of this subpart are applicable to manufacturers of engines subject to the provisions of Subpart A of this part, excluding small-volume manufacturers.

* * * * *

33. Section 94.503 is amended by adding a new paragraph (d) to read as follows:

§ 94.503 General requirements.

* * * * *

(d) If you certify an engine family with carryover emission data, as described in § 94.206(c), and these equivalent engine families consistently meet the emission standards with production-line testing over the preceding two-year period, you may ask for a reduced testing rate for further production-line testing for that family. The minimum testing rate is one engine per engine family. If we reduce your testing rate, we may limit our approval to a single model year.

Subpart J—[Amended]

34. Section 94.907 is amended by revising paragraphs (d) and (g) to read as follows:

§ 94.907 Engine dressing exemption.

* * * * *

(d) New marine engines that meet all the following criteria are exempt under this section:

(1) You must produce it by marinizing an engine covered by a valid certificate

of conformity from one of the following programs:

(i) Heavy-duty highway engines (40 CFR part 86).

(ii) Land-based nonroad diesel engines (40 CFR part 89).

(iii) Locomotive engines (40 CFR part 92).

(2) The engine must have the label required under 40 CFR part 86, 89, or 92.

(3) You must not make any changes to the certified engine that could reasonably be expected to increase its emissions. For example, if you make any of the following changes to one of these engines, you do not qualify for the engine dressing exemption:

(i) Changing any fuel system parameters from the certified configuration.

(ii) Replacing an original turbocharger, except that small-volume manufacturers of recreational engines may replace an original turbocharger with one that matches the performance of the original turbocharger.

(iii) Modify or design the marine engine cooling or aftercooling system so that temperatures or heat rejection rates are outside the original engine manufacturer's specified ranges.

(4) You must make sure that fewer than 50 percent of the engine model's total sales, from all companies, are used in marine applications.

* * * * *

(g) If your engines do not meet the criteria listed in paragraphs (d)(2) through (d)(4) of this section, they will be subject to the standards and prohibitions of this part. Marinization without a valid exemption or certificate of conformity would be a violation of § 94.1103(a)(1) and/or the tampering prohibitions of the applicable land-based regulations (40 CFR part 86, 89, or 92).

* * * * *

Subpart K—[Amended]

35. Section 94.1103 is amended by revising paragraph (a)(5) to read as follows:

§ 94.1103 Prohibited acts.

(a) * * *

(5) For a manufacturer of marine vessels to distribute in commerce, sell, offer for sale, or deliver for introduction into commerce a new vessel containing an engine not covered by a certificate of conformity applicable for an engine model year the same as or later than the calendar year in which the manufacture of the new vessel is initiated. (Note: For the purpose of this paragraph (a)(5), the manufacture of a vessel is initiated when the keel is laid, or the vessel is at a similar stage of construction.) In general, you may use up your normal inventory of engines not certified to new emission standards if they were built before the date of the new standards. However, we consider stockpiling of these engines to be a violation of paragraph (a)(1)(i)(A) of this section.

* * * * *

37. A new subchapter U is added to read as follows:

SUBCHAPTER U—AIR POLLUTION CONTROLS

PART 1048—CONTROL OF EMISSIONS FROM NEW, LARGE NONROAD SPARK-IGNITION ENGINES

Subpart A—Determining How To Follow This Part

Sec.

1048.1 Does this part apply to me?
1048.5 May I exclude any engines from this part's requirements?
1048.10 What main steps must I take to comply with this part?
1048.15 Do any other regulation parts affect me?
1048.20 What requirements from this part apply to my excluded engines?

Subpart B—Emission Standards and Related Requirements

1048.101 What exhaust emission standards must my engines meet?
1048.105 What steps must I take to address evaporative emissions?
1048.110 How must my engines diagnose malfunctions?
1048.115 What other requirements must my engines meet?
1048.120 What warranty requirements apply to me?
1048.125 What maintenance instructions must I give to buyers?
1048.130 What installation instructions must I give to equipment manufacturers?
1048.135 How must I label and identify the engines I produce?
1048.140 How do I certify my engines to more stringent, voluntary standards?
1048.145 What provisions apply only for a limited time?

Subpart C—Certifying Engine Families

1048.201 What are the general requirements for submitting a certification application?
1048.205 How must I prepare my application?
1048.210 May I get preliminary approval before I complete my application?
1048.215 What happens after I complete my application?
1048.220 How do I amend the maintenance instructions in my application?
1048.225 How do I amend my application to include new or modified engines?
1048.230 How do I select engine families?
1048.235 How does testing fit with my application for a certificate of conformity?
1048.240 How do I determine if my engine family complies with emission standards?
1048.245 What records must I keep and make available to EPA?
1048.250 When may EPA deny, revoke, or void my certificate of conformity?

Subpart D—Testing Production-line Engines

1048.301 When must I test my production-line engines?
1048.305 How must I prepare and test my production-line engines?
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1048.315 How do I know when my engine family does not comply?
1048.320 What happens if one of my production-line engines fails to meet emission standards?
1048.325 What happens if an engine family does not comply?
1048.330 May I sell engines from an engine family with a suspended certificate of conformity?
1048.335 How do I ask EPA to reinstate my suspended certificate?
1048.340 When may EPA revoke my certificate under this subpart and how may I sell these engines again?
1048.345 What production-line testing records must I send to EPA?
1048.350 What records must I keep?

Subpart E—Testing In-Use Engines

1048.401 What testing requirements apply to my engines that have gone into service?
1048.405 How does this program work?
1048.410 How must I select, prepare, and test my in-use engines?
1048.415 How can I use in-use emission credits?
1048.420 What happens if my in-use engines do not meet requirements?
1048.425 What in-use testing information must I report to EPA?
1048.430 What records must I keep?

Subpart F—Test Procedures

1048.501 What procedures must I use to test my engines?
1048.505 What steady-state duty cycles apply for laboratory testing?
1048.510 What transient duty cycles apply for laboratory testing?
1048.515 Field-testing procedures.

Subpart G—Compliance Provisions

1048.601 What compliance provisions apply to these engines?
1048.605 What are the provisions for exempting engines from the requirements of this part if they are already certified under the motor-vehicle program?
1048.610 What are the provisions for producing nonroad equipment with engines already certified under the motor-vehicle program?
1048.615 What are the provisions for exempting engines designed for lawn and garden applications?

Subpart H—Definitions and Other Reference Information

1048.701 What definitions apply to this part?
1048.705 What symbols, acronyms, and abbreviations does this part use?
1048.710 What materials does this part reference?
1048.715 How should I request EPA to keep my information confidential?
1048.720 How do I request a public hearing?

Appendix I to Part 1048—Transient Duty Cycle for Constant-Speed Engines

Appendix II to Part 1048—Transient Duty Cycle for Engines That Are Not Constant-Speed Engines

Authority: 42 U.S.C. 7401–7671(q).

Subpart A—Determining How to Follow This Part

§ 1048.1 Does this part apply to me?

(a) This part applies to you if you manufacture or import new, spark-ignition, nonroad engines (defined in § 1048.701) with rated power above 19 kW, unless we exclude them under § 1048.5.

(b) If you manufacture or import engines with rated power at or below 19 kW that would otherwise be covered by 40 CFR part 90, you may choose to meet the requirements of this part instead. In this case, all the provisions of this part apply for those engines.

(c) Note in subpart G of this part that 40 CFR part 1068 applies to everyone, including anyone who manufactures, installs, owns, operates, or rebuilds any of the engines this part covers or equipment containing these engines.

(d) You need not follow this part for engines you produce before the 2004 model year, unless you certify voluntarily. See § 1048.100, § 1048.145, and the definition of model year in § 1048.701 for more information about the timing of new requirements.

(e) See §§ 1048.701 and 1048.705 for definitions and acronyms that apply to this part.

§ 1048.5 May I exclude any engines from this part's requirements?

(a) You may exclude the following nonroad engines:

(1) Engines used in snowmobiles, all-terrain vehicles, or off-highway motorcycles and regulated in 40 CFR part 1051.

(2) Propulsion marine engines. See 40 CFR part 91. This part applies with respect to auxiliary marine engines.

(b) You may exclude engines used in aircraft. See 40 CFR part 87.

(c) You may exclude stationary engines, except that you must meet the requirements in § 1048.20. In addition, the prohibitions in 40 CFR 1068.101 restrict the use of stationary engines for non-stationary purposes.

(d) See subpart G of this part and 40 CFR part 1068, subpart C, for exemptions of specific engines.

(e) Send the Designated Officer a written request if you want us to determine whether this part covers or excludes certain engines. Excluding engines from this part's requirements does not affect other requirements that may apply to them.

§ 1048.10 What main steps must I take to comply with this part?

(a) You must have a certificate of conformity from us for each engine family before you do any of the following with a new engine covered by this part: Sell, offer for sale, introduce into commerce, distribute or deliver for introduction into commerce, or import it into the United States. ''New'' engines may include some already placed in service (see the definition of ''new nonroad engine'' and ''new nonroad equipment'' in § 1048.701). You must get a new certificate of conformity for each new model year.

(b) To get a certificate of conformity and comply with its terms, you must do five things:

(1) Meet the emission standards and other requirements in subpart B of this part.

(2) Apply for certification (see subpart C of this part).

(3) Do routine emission testing on production engines (see subpart D of this part).

(4) Do emission testing on in-use engines, as we direct (see subpart E of this part).

(5) Follow our instructions throughout this part.

(c) Subpart F of this part and 40 CFR part 1065 describe the procedures you must follow to test your engines.

(d) Subpart G of this part and 40 CFR part 1068 describe requirements and prohibitions that apply to engine manufacturers, equipment manufacturers, owners, operators, rebuilders, and all others.

§ 1048.15 Do any other regulation parts affect me?

(a) Part 1065 of this chapter describes procedures and equipment specifications for testing engines. Subpart F of this part describes how to apply the provisions of part 1065 of this chapter to show you meet the emission standards in this part.

(b) Part 1068 of this chapter describes general provisions, including these seven areas:

(1) Prohibited acts and penalties for engine manufacturers, equipment manufacturers, and others.

(2) Rebuilding and other aftermarket changes.

(3) Exemptions for certain engines.

(4) Importing engines.

(5) Selective enforcement audits of your production.

(6) Defect reporting and recall.

(7) Procedures for public hearings.

(c) Other parts of this chapter affect you if referenced in this part.

§ 1048.20 What requirements from this part apply to my excluded engines?

(a) Manufacturers of stationary engines that would otherwise need to meet the requirements of this part must add a permanent label or tag identifying each engine. This applies equally to importers. To meet labeling requirements, you must do the following things:

(1) Attach the label or tag in one piece so no one can remove it without destroying or defacing it.

(2) Make sure it is durable and readable for the engine's entire life.

(3) Secure it to a part of the engine needed for normal operation and not normally requiring replacement.

(4) Write it in block letters in English.

(5) Instruct equipment manufacturers that they must place a duplicate label as described in § 1068.105 of this chapter if they obscure the engine's label.

(b) Engine labels or tags required under this section must have the following information:

(1) Include the heading ''Emission Control Information.''

(2) Include your full corporate name and trademark.

(3) State the engine displacement (in liters) and rated power.

(4) State: ''THIS ENGINE IS EXCLUDED FROM THE REQUIREMENTS OF 40 CFR PART 1048 AS A ''STATIONARY ENGINE.'' INSTALLING OR USING THIS ENGINE IN ANY OTHER APPLICATION MAY BE A VIOLATION OF FEDERAL LAW SUBJECT TO CIVIL PENALTY.''.

Subpart B—Emission Standards and Related Requirements

§ 1048.101 What exhaust emission standards must my engines meet?

(a) The exhaust emission standards in Table 1 of § 1048.101 apply for steady-state measurement of emissions with the duty-cycle test procedures in subpart F of this part:

TABLE 1 OF § 1048.101.—STEADY-STATE DUTY-CYCLE EMISSION STANDARDS (g/kW-hr)

Model year	Emission standards		Alternate emission standards	
	$HC+NO_X$	CO	$HC+NO_X$	CO
2004–2006	4.0	50.0	.....	.....
2007 and later	3.4	3.4	1.3	27.0

(b) The exhaust emission standards in Table 2 of § 1048.101 apply for transient measurement of emissions with the duty-cycle test procedures in subpart F of this part:

TABLE 2 OF § 1048.101.—TRANSIENT DUTY-CYCLE EMISSION STANDARDS (g/kW-hr)

Model year	Emission standards		Alternate emission standards	
	$HC+NO_X$	CO	$HC+NO_X$	CO
2007 and later	3.4	3.4	1.3	27.0

(c) The exhaust emission standards in Table 3 of § 1048.101 apply for emission measurements with the field-test procedures in subpart F of this part:

TABLE 3 OF § 1048.101.—FIELD-TESTING EMISSION STANDARDS (g/kW-hr)

Model year	Emission standards		Alternate emission standards	
	$HC+NO_X$	CO	$HC+NO_X$	CO
2007 and later	4.7	5.0	1.8	41.0

(d) You may choose to meet the alternate emission standards instead of the regular emission standards, as described in paragraphs (a) through (c) of this section.

(e) The standards apply for the model years listed in the tables in this section. You may choose to certify earlier model years.

(f) Apply the exhaust emission standards in this section for engines using all fuels. You must meet the numerical emission standards for hydrocarbons in this section based on the following types of hydrocarbon emissions for engines powered by the following fuels:

(1) Gasoline- and LPG-fueled engines: THC emissions.

(2) Natural gas-fueled engines: NMHC emissions (for testing to show that these engines meet the emission standards in paragraph (c) of this section, disregard hydrocarbon emissions).

(3) Alcohol-fueled engines: THCE emissions.

(g) Certain engines with total displacement at or below 1000 cc may comply with the requirements of 40 CFR part 90 instead of complying with the emission standards in this section, as described in § 1048.615.

(h) You must show in your certification application that your engines meet the exhaust emission standards in paragraphs (a) through (c) of this section over their full useful life. The minimum useful life is 5,000 hours of operation or seven years, whichever comes first. Specify a longer useful life under either of two conditions:

(1) If you design, advertise, or market your engine to operate longer than the minimum useful life (your recommended time until rebuild may indicate a longer design life).

(2) If your basic mechanical warranty is longer than the minimum useful life.

(i) Refer to § 1048.240 to apply deterioration factors.

(j) Apply this subpart to all testing, including production-line and in-use testing, as described in subparts D and E of this part.

§ 1048.105 What steps must I take to address evaporative emissions?

(a) Starting in the 2007 model year, if you produce an engine that runs on a volatile liquid fuel (such as gasoline), you must take the following steps to address evaporative emissions:

(1) Specify and incorporate design features to avoid venting fuel vapors directly to the atmosphere. Evaporative hydrocarbon emissions must be less than 0.2 grams per gallon of fuel tank capacity during a nine-hour period of gradually increasing ambient temperatures from 22 to 36° C with fuel meeting the specifications in 40 CFR 1065.210, when measured from an engine with a complete fuel system using the equipment and procedures specified in 40 CFR 86.107–96 and 86.133–96. You may rely on any of the following designs instead of doing emission tests to show that you meet this requirement:

(i) Use a tethered or self-closing gas cap on a fuel tank that stays sealed up to a positive pressure of 24.5 kPa (3.5 psi) or a vacuum pressure of 10.5 kPa (1.5 psi).

(ii) Use a tethered or self-closing gas cap on a fuel tank that stays sealed up to a positive or vacuum pressure of 7 kPa (1 psi). Use an inflatable, nonpermeable bag that occupies the vapor space inside the fuel tank, exchanging air with the ambient as needed to prevent pressure buildup in the tank. The volume of the inflatable bag must be at least 30 percent of the total tank volume.

(iii) Use a tethered or self-closing gas cap on a fuel tank that stays sealed except for venting to a charcoal canister. The engine must be designed to draw hydrocarbons from the canister into the engine's combustion chamber as needed to prevent evaporative emissions during normal operation.

(iv) Use a tethered or self-closing gas cap on a collapsible bladder tank. A collapsible bladder tank is one that

changes in volume as needed to accommodate the changing amount of liquid fuel, thus eliminating the vapor space.

(2) For nonmetallic fuel lines, specify and use products that meet the Category 1 specifications in SAE J2260 ''Nonmetallic Fuel System Tubing with One or More Layers,'' November 1996 (incorporated by reference in § 1048.710).

(3) Liquid fuel in the fuel tank may not reach boiling during continuous engine operation in the final installation at an ambient temperature of 30° C. Gasoline with a volatility of 9 RVP begins to boil at about 53° C. You may satisfy this requirement by specifying and incorporating design features to prevent fuel boiling under all normal operation.

(b) If other companies install your engines in their equipment, give them any appropriate instructions, as described in § 1048.130.

§ 1048.110 How must my engines diagnose malfunctions?

(a) *Equip your engines with a diagnostic system.* Starting in the 2007 model year, make sure your system will detect significant malfunctions in its emission-control system using one of the following protocols:

(1) If your emission-control strategy depends on maintaining air-fuel ratios at stoichiometry, an acceptable diagnostic design would identify malfunction whenever the air-fuel ratio does not cross stoichiometry for one minute. You may use other diagnostic strategies if we approve them in advance.

(2) If the protocol described in paragraph (a)(1) of this section does not apply to your engine, you must use an alternative approach that we approve in advance.

(b) *Use a malfunction-indicator light (MIL).* Make sure the MIL is readily visible to the operator; it may be any color except red. When the MIL goes on, it must display ''Check Engine,'' ''Service Engine Soon,'' or a similar message that we approve. You may use sound in addition to the light signal. The MIL must go on under each of these circumstances:

(1) When a malfunction occurs, as described in paragraph (a) of this section.

(2) When the diagnostic system cannot send signals to meet the requirement of paragraph (b)(1) of this section.

(3) When the engine's ignition is in the ''key-on'' position before starting or cranking. The MIL should go out after engine starting if the system detects no malfunction.

(c) *Control when the MIL can go out.* If the MIL goes on to show a malfunction, it must remain on during all later engine operation until servicing corrects the malfunction. If the engine is not serviced, but the malfunction does not recur for three consecutive engine starts during which the malfunctioning system is evaluated and found to be working properly, the MIL may stay off during later engine operation.

(d) *Store trouble codes in computer memory.* Record and store in computer memory any diagnostic trouble codes showing a malfunction that should illuminate the MIL. The stored codes must identify the malfunctioning system or component as uniquely as possible. Make these codes available through the data link connector as described in paragraph (g) of this section. You may store codes for conditions that do not turn on the MIL. The system must store a separate code to show when the diagnostic system is disabled (from malfunction or tampering).

(e) *Make data, access codes, and devices accessible.* Make all required data accessible to us without any access codes or devices that only you can supply. Ensure that anyone servicing your engine can read and understand the diagnostic trouble codes stored in the onboard computer with generic tools and information.

(f) *Consider exceptions for certain conditions.* Your diagnostic systems may disregard trouble codes for the first three minutes after engine starting. You may ask us to approve diagnostic-system designs that disregard trouble codes under other conditions that would produce an unreliable reading, damage systems or components, or cause other safety risks. This might include operation at altitudes over 8,000 feet.

(g) *Follow standard references for formats, codes, and connections.* Follow conventions defined in the following documents (incorporated by reference in § 1048.710), or ask us to approve using updated versions of these documents:

(1) ISO 9141–2 February 1994, Road vehicles—Diagnostic systems Part 2.

(2) ISO 14230–4 June 2000, Road vehicles—Diagnostic systems—KWP 2000 requirements for emission-related systems.

§ 1048.115 What other requirements must my engines meet?

Your engines must meet the following requirements:

(a) *Closed crankcase.* Design and produce your engines so they release no crankcase emissions into the atmosphere.

(b) *Torque broadcasting.* Electronically controlled engines must broadcast their speed and output shaft torque (in newton-meters) on their controller area networks. Engines may alternatively broadcast a surrogate value for torque that can be read with a remote device. This information is necessary for testing engines in the field (see § 1065.515 of this chapter). This requirement applies beginning in the 2007 model year.

(c) *EPA access to broadcast information.* If we request it, you must provide us any hardware or tools we would need to readily read, interpret, and record all information broadcast by an engine's on-board computers and electronic control modules. If you broadcast a surrogate parameter for torque values, you must provide us what we need to convert these into torque units. We will not ask for hardware or tools if they are readily available commercially.

(d) *Emission sampling capability.* Produce all your engines to allow sampling of exhaust emissions in the field. This sampling requires either exhaust ports downstream of any aftertreatment devices or the ability to extend the exhaust pipe by 20 cm. This is necessary to minimize any diluting effect from ambient air at the end of the exhaust pipe.

(e) *Adjustable parameters.* If your engines have adjustable parameters, make sure they meet all the requirements of this part for any adjustment in the physically available range.

(1) We do not consider an operating parameter adjustable if you permanently seal it or if ordinary tools cannot readily access it.

(2) We may require that you set adjustable parameters to any specification within the adjustable range during certification testing, production-line testing, selective enforcement auditing, or any required in-use testing.

(f) *Prohibited controls.* You may not design engines with an emission-control system that emits any noxious or toxic substance that the engine would not emit during operation in the absence of such a system, except as specifically permitted by regulation.

(g) *Defeat devices.* You may not equip your engines with a defeat device. A defeat device is an auxiliary emission-control device or other control feature that reduces the effectiveness of emission controls under conditions you may reasonably expect the engine to encounter during normal operation and use. This does not apply to auxiliary

emission-control devices you identify in your certification application if any of the following is true:

(1) The conditions of concern were substantially included in your prescribed duty cycles.

(2) You show your design is necessary to prevent catastrophic engine (or equipment) damage or accidents.

(3) The reduced effectiveness applies only to starting the engine.

§ 1048.120 What warranty requirements apply to me?

(a) You must warrant to the ultimate buyer that the new engine meets two conditions:

(1) You have designed, built, and equipped it to meet the requirements of this part.

(2) It is free from defects in materials and workmanship that may keep it from meeting these requirements.

(b) Your emission-related warranty must be valid for at least 50 percent of the engine's useful life in hours of operation or at least three years, whichever comes first. In the case of a high-cost warranted part, the warranty must be valid for at least 70 percent of the engine's useful life in hours of operation or at least five years, whichever comes first. You may offer a warranty more generous than we require. This warranty may not be shorter than any published or negotiated warranty you offer for the engine or any of its components. If an engine has no tamper-proof hour meter, we base the warranty periods in this paragraph only on the engine's age (in years).

(c) The emission-related warranty must cover components whose failure would increase an engine's emissions, includeing electronic controls, fuel injection (for liquid or gaseous fuels), exhaust-gas recirculation, aftertreatment, or any other system you develop to control emissions. In general, we consider replacing or repairing other components to be the owner's responsibility.

(d) You may exclude from your warranty a component named in paragraph (c) of this section, if it meets both of the following conditions:

(1) It was in general use on similar engines before January 1, 2000.

(2) Its failure would clearly degrade the engine's performance enough that the operator would need to repair or replace it.

(e) You may limit your emission-related warranty's validity to properly maintained engines, as described in § 1068.115 of this chapter.

(f) If you make an aftermarket part, you may—but do not have to—certify that using the part will still allow engines to meet emission standards, as described in § 85.2114 of this chapter.

§ 1048.125 What maintenance instructions must I give to buyers?

Give the ultimate buyer of each new engine written instructions for properly maintaining and using the engine, including the emission-control system. The maintenance instructions also apply to service accumulation on your test engines, as described in 40 CFR part 1065, subpart E.

(a) *Critical emission-related maintenance.* You may schedule critical maintenance on particular devices if you meet the following conditions:

(1) You may ask us to approve maintenance on air-injection, fuel-system, or ignition components, aftertreatment devices, exhaust gas recirculation systems, crankcase ventilation valves, or oxygen sensors only if it meets two criteria:

(i) Operators are reasonably likely to do the maintenance you call for.

(ii) Engines need the maintenance to meet emission standards.

(2) We will accept scheduled maintenance as reasonably likely to occur in use if you satisfy any of four conditions:

(i) You present data showing that, if a lack of maintenance increases emissions, it also unacceptably degrades the engine's performance.

(ii) You present survey data showing that 80 percent of engines in the field get the maintenance you specify at the recommended intervals.

(iii) You provide the maintenance free of charge and clearly say so in maintenance instructions for the customer.

(iv) You otherwise show us that the maintenance is reasonably likely to be done at the recommended intervals.

(b) *Minimum maintenance intervals.* You may not schedule emission-related maintenance within the minimum useful life period for aftertreatment devices, fuel injectors, sensors, electronic control units, and turbochargers.

(c) *Noncritical emission-related maintenance.* For engine parts not listed in paragraph (a) or (b) of this section, you may recommend any additional amount of inspection or maintenance. But you must state clearly that these steps are not necessary to keep the emission-related warranty valid. Also, do not take these inspection or maintenance steps during service accumulation on your test engines.

(d) *Source of parts and repairs.* Print clearly on the first page of your written maintenance instructions that any repair shop or person may maintain, replace, or repair emission-control devices and systems. Make sure your instructions require no component or service identified by brand, trade, or corporate name. Also, do not directly or indirectly distinguish between service by companies with which you have a commercial relationship and service by independent repair shops or the owner. You may disregard the requirements in this paragraph (d) if you do one of two things:

(1) Provide a component or service without charge under the purchase agreement.

(2) Get us to waive this prohibition in the public's interest by convincing us the engine will work properly only with the identified component or service.

§ 1048.130 What installation instructions must I give to equipment manufacturers?

(a) If you sell an engine for someone else to install in a piece of nonroad equipment, give the buyer of the engine written instructions for installing it consistent with the requirements of this part. Make sure these instructions have the following information:

(1) Include the heading: ''Emission-related installation instructions.''

(2) State: ''Failing to follow these instructions when installing a certified engine in a piece of nonroad equipment violates federal law (40 CFR 1068.105(b)), subject to fines or other penalties as described in the Clean Air Act.''.

(3) Describe any other instructions needed to install an exhaust aftertreatment device consistent with your application for certification.

(4) Describe the steps needed to control evaporative emissions, as described in § 1048.105.

(5) Describe any necessary steps for installing the diagnostic system described in § 1048.110.

(6) Describe any limits on the range of applications needed to ensure that the engine operates consistently with your application for certification. For example, if your engines are certified only for constant-speed operation, tell equipment manufacturers not to install the engines in variable-speed applications. Also, if you need to avoid sustained high-load operation to meet the field-testing emission standards we specify in § 1048.101(c), describe how the equipment manufacturer must properly size the engines for a given application.

(7) Describe any other instructions to make sure the installed engine will operate according to design specifications in your application for certification.

(8) State: ''If you obscure the engine's emission label, you must place a duplicate label on your equipment, as described in 40 CFR 1068.105.''.

(b) You do not need installation instructions for engines you install in your own equipment.

§ 1048.135 How must I label and identify the engines I produce?

(a) Assign each production engine a unique identification number and permanently and legibly affix or engrave it on the engine.

(b) At the time of manufacture, add a permanent label identifying each engine. To meet labeling requirements, do four things:

(1) Attach the label in one piece so it is not removable without being destroyed or defaced.

(2) Design and produce it to be durable and readable for the engine's entire life.

(3) Secure it to a part of the engine needed for normal operation and not normally requiring replacement.

(4) Write it in block letters in English.

(c) On your engine label, do 13 things:

(1) Include the heading ''EMISSION CONTROL INFORMATION.''

(2) Include your full corporate name and trademark.

(3) State: ''THIS ENGINE IS CERTIFIED TO OPERATE ON [specify operating fuel or fuels].''

(4) Identify the emission-control system; your identifiers must use names and abbreviations consistent with SAE J1930, which we incorporate by reference (see § 1048.710).

(5) List all requirements for fuel and lubricants.

(6) State the date of manufacture [DAY (optional), MONTH, and YEAR]; if you stamp this information on the engine and print it in the owner's manual, you may omit it from the label.

(7) State: ''THIS ENGINE MEETS U.S. ENVIRONMENTAL PROTECTION AGENCY REGULATIONS FOR [MODEL YEAR] LARGE NONROAD SI ENGINES.''

(8) Include EPA's standardized designation for the engine family.

(9) State the engine's displacement (in liters) and rated power.

(10) State the engine's useful life (see § 1048.101(h)).

(11) List specifications and adjustments for engine tuneups; show the proper position for the transmission during tuneup and state which accessories should be operating.

(12) Describe other information on proper maintenance and use.

(13) Identify the emission standards to which you have certified the engine.

(d) Some of your engines may need more information on the label.

(1) If you have an engine family that has been certified only for constant-speed engines, add to the engine label ''CONSTANT-SPEED ONLY.''

(2) If you certify an engine to the voluntary standards in § 1048.140, add to the engine label ''BLUE SKY SERIES.''

(3) If you produce an engine we exempt from the requirements of this part, see 40 CFR part 1068, subparts C and D, for more label information.

(e) Some engines may not have enough space for a label with all the required information. In this case, you may omit the information required in paragraphs (c)(3), (c)(4), (c)(5), and (c)(12) of this section if you print it in the owner's manual instead.

(f) If you are unable to meet these labeling requirements, you may ask us to modify them consistent with the intent of this section.

(g) If you obscure the engine label while installing the engine in the vehicle, you must place a duplicate label on the vehicle. If someone else installs the engine in a vehicle, give them duplicate labels if they ask for them (see 40 CFR 1068.105).

§ 1048.140 How do I certify my engines to more stringent, voluntary standards?

This section defines voluntary standards that allow you to produce engines with a recognized level of superior emission control. We refer to these as ''Blue Sky Series'' engines. If you certify engines under this section, they must meet one of the following standards:

(a) For the 2003 model year, an engine family may qualify for designation as ''Blue Sky Series'' by meeting all the requirements in this part that apply to 2004 model year engines. This includes all testing and reporting requirements.

(b) For the 2003 through 2006 model years, an engine family may qualify for designation as ''Blue Sky Series'' by meeting all the requirements in this part that apply to 2007 model year engines. This includes all testing and reporting requirements.

(c) Any engine family may qualify for designation as ''Blue Sky Series'' by meeting all the requirements in this part, while certifying to the following voluntary emission standards:

(1) 1.3 g/kW-hr $HC+NO_X$ and 3.4 g/kW-hr CO using steady-state and transient test procedures, as described in subpart F of this part.

(2) 1.8 g/kW-hr $HC+NO_X$ and 4.7 g/kW-hr CO using field-testing procedures, as described in subpart F of this part.

§ 1048.145 What provisions apply only for a limited time?

The provisions in this section apply instead of other provisions in this part. This section describes when these interim provisions expire.

(a) *Family banking.* You may certify an engine family to comply with all the 2007 model year requirements before 2007. For each year of early compliance for an engine family, you may delay certification by one year for a different engine family with smaller projected power-weighted nationwide sales. For example, if you sell 1,000 engines with an average power rating of 50 kW certified a year early, you may delay certification for another engine family with an average power rating of 100 kW of up to 500 engines. You must notify us as soon as you are aware of such a discrepancy between projected and actual sales.

(b) *Hydrocarbon standards.* For 2004 through 2006 model years, manufacturers may use nonmethane hydrocarbon measurements to demonstrate compliance with applicable emission standards.

(c) *Transient emission testing.* Engines rated over 560 kW are exempt from the transient emission standards in § 1048.101(b).

(d) *In-use emission credits with steady-state testing.* You may generate credits for the in-use averaging program described in § 1048.415 using steady-state test procedures for 2004 through 2006 model years.

(e) *Optional early field testing.* For 2004 through 2006 model years, manufacturers may optionally use the field-testing procedures in subpart F of this part for any in-use testing required under subpart E of this part. In this case, the same emission standards apply to both steady-state testing and field testing.

(f) *Small-volume provisions.* Special provisions apply to you if you manufacture fewer than 300 engines per year that are subject to the standards of this part.

(1) For 2004 through 2006 model year engines, the lawn and garden exemption described in § 1048.615 applies to your engines with total displacement up to 2500 cc with rated power at or below 30 kW. To qualify for this exemption, you must meet a CO emission standard of 130 g/kW-hr using the procedures specified in 40 CFR part 90.

(2) For 2007 through 2009 model year engines, you may optionally comply with the emission standards and other requirements that would otherwise apply starting in 2004.

(3) If you qualify for the hardship provisions in § 1068.241 of this chapter,

we may approve extensions of up to three years total.

Subpart C—Certifying Engine Families

§ 1048.201 What are the general requirements for submitting a certification application?

(a) Send us an application for a certificate of conformity for each engine family. Each application is valid for only one model year.

(b) The application must not include false or incomplete statements or information (see § 1048.250). We may choose to ask you to send us less information than we specify in this subpart, but this would not change your recordkeeping requirements.

(c) Use good engineering judgment for all decisions related to your application (see § 1068.5 of this chapter).

(d) An authorized representative of your company must approve and sign the application.

§ 1048.205 How must I prepare my application?

In your application, you must do all the following things:

(a) Describe the engine family's specifications and other basic parameters of the engine's design. List the types of fuel you intend to use to certify the engine family (for example, gasoline, liquefied petroleum gas, methanol, or natural gas).

(b) Explain how the emission-control system operates. Describe in detail all the system's components, auxiliary emission-control devices, and all fuel-system components you will install on any production or test engine. Explain why any auxiliary emission-control devices are not defeat devices (see § 1048.115(g)). Do not include detailed calibrations for components unless we ask for them.

(c) Explain how the engine diagnostic system works, describing especially the engine conditions (with the corresponding diagnostic trouble codes) that cause the malfunction-indicator light to go on. Propose what you consider to be extreme conditions under which the diagnostic system should disregard trouble codes, as described in § 1048.110.

(d) Describe the engines you selected for testing and the reasons for selecting them.

(e) Describe any special or alternate test procedures you used (see § 1048.501).

(f) Identify the duty cycle and the number of engine operating hours used to stabilize emission levels. Describe any scheduled maintenance you did.

(g) List the specifications of the test fuel to show that it falls within the required ranges we specify in 40 CFR part 1065, subpart C.

(h) Identify the engine family's useful life.

(i) Propose maintenance and use instructions for the ultimate buyer of each new engine (see § 1048.125).

(j) Propose emission-related installation instructions if you sell engines for someone else to install in a piece of nonroad equipment (see § 1048.130).

(k) Identify each high-cost warranted part and show us how you calculated its replacement cost, including the estimated retail cost of the part, labor rates, and labor hours to diagnose and replace defective parts.

(l) Propose an emission-control label.

(m) Present emission data for HC, NO_X, and CO on a test engine to show your engines meet the duty-cycle emission standards we specify in § 1048.101(a) and (b). Show these figures before and after applying deterioration factors for each engine. Include test data for each type of fuel on which you intend for engines in the engine family to operate (for example, gasoline, liquefied petroleum gas, methanol, or natural gas).

(n) Report all test results, including those from invalid tests or from any nonstandard tests (such as measurements based on exhaust concentrations in parts per million).

(o) Identify the engine family's deterioration factors and describe how you developed them. Present any emission test data you used for this.

(p) Describe all adjustable operating parameters (see § 1048.115(d)), including the following:

(1) The nominal or recommended setting and the associated production tolerances.

(2) The intended physically adjustable range.

(3) The limits or stops used to establish adjustable ranges.

(4) Production tolerances of the limits or stops used to establish each physically adjustable range.

(5) Information showing that someone cannot readily modify the engines to operate outside the physically adjustable range.

(q) Describe everything we need to read and interpret all the information broadcast by an engine's onboard computers and electronic control modules and state that you will give us any hardware or tools we would need to do this. You may reference any appropriate publicly released standards that define conventions for these messages and parameters. Format your information consistent with publicly released standards.

(r) If your engine family includes a volatile liquid fuel, propose a set of design parameters and instructions for installing the engine to minimize evaporative emissions (see § 1048.115(g)).

(s) State whether your engine will operate in variable-speed applications, constant-speed applications, or both. If your certification covers only constant-speed applications, describe how you will prevent use of these engines in variable-speed applications.

(t) State that all the engines in the engine family comply with the field-testing emission standards we specify in § 1048.101(c) for all normal operation and use (see § 1048.515). Describe in detail any testing, engineering analysis, or other information on which you base this statement.

(u) State that you operated your test engines according to the specified procedures and test parameters using the fuels described in the application to show you meet the requirements of this part.

(v) State unconditionally that all the engines in the engine family comply with the requirements of this part, other referenced parts, and the Clean Air Act (42 U.S.C. 7401 et seq.).

(w) Include estimates of engine production.

(x) Add other information to help us evaluate your application if we ask for it.

§ 1048.210 May I get preliminary approval before I complete my application?

If you send us information before you finish the application, we will review it and make any appropriate determinations listed in § 1048.215(b) within 90 days of your request. If we need to ask you for further information, we will extend the 90-day period by the number of days we wait for your response.

§ 1048.215 What happens after I complete my application?

(a) If any of the information in your application changes after you submit it, amend it as described in § 1048.225.

(b) We may decide that we cannot approve your application unless you revise it.

(1) If you inappropriately use the provisions of § 1048.230(c) or (d) to define a broader or narrower engine family, we will require you to redefine your engine family.

(2) If we determine your selected useful life for the engine family is too short, we will require you to lengthen it (see § 1048.101(h)).

(3) If we determine your deterioration factors are not appropriate, we will

require you to revise them (see § 1048.240(c)).

(4) If your diagnostic system is inadequate for detecting significant malfunctions in emission-control systems, we will require you to make the system more effective (see § 1048.110(b)).

(5) If your diagnostic system inappropriately disregards trouble codes under certain conditions, we will require you to change the system to operate under broader conditions (see § 1048.110(g)).

(6) If your proposed label is inconsistent with § 1048.135, we will require you to change it (and tell you how, if possible).

(7) If you require or recommend maintenance and use instructions inconsistent with § 1048.125, we will require you to change them.

(8) If we find any other problem with your application, we will tell you how to correct it.

(c) If we determine your application is complete and shows you meet all the requirements, we will issue a certificate of conformity for your engine family for that model year. If we deny the application, we will explain why in writing. You may then ask us to hold a hearing to reconsider our decision (see § 1048.720).

§ 1048.220 How do I amend the maintenance instructions in my application?

Send the Designated Officer a request to amend your application for certification for an engine family if you want to change the maintenance instructions in a way that could affect emissions. In your request, describe the proposed changes to the maintenance instructions. Unless we disapprove it, you may distribute the new maintenance instructions to your customers 30 days after we receive your request. We may also approve a shorter time or waive this requirement.

§ 1048.225 How do I amend my application to include new or modified engines?

(a) You must amend your application for certification before you take either of the following actions:

(1) Add an engine to a certificate of conformity.

(2) Make a design change for a certified engine family that may affect emissions or an emission-related part over the engine's lifetime.

(b) Send the Designated Officer a request to amend the application for certification for an engine family. In your request, do all of the following:

(1) Describe the engine model or configuration you are adding or changing.

(2) Include engineering evaluations or reasons why the original test engine is or is not still appropriate.

(3) If the original test engine for the engine family is not appropriate to show compliance for the new or modified engine, include new test data showing that the new or modified engine meets the requirements of this part.

(c) You may start producing the new or modified engine anytime after you send us your request.

(d) You must give us test data within 30 days if we ask for more testing, or stop producing the engine if you cannot do this.

(e) If we determine that the certificate of conformity would not cover your new or modified engine, we will send you a written explanation of our decision. In this case, you may no longer produce these engines, though you may ask for a hearing for us to reconsider our decision (see § 1048.720).

§ 1048.230 How do I select engine families?

(a) Divide your product line into families of engines that you expect to have similar emission characteristics. Your engine family is limited to a single model year.

(b) Group engines in the same engine family if they are identical in all of the following aspects:

(1) The combustion cycle.

(2) The cooling system (water-cooled vs. air-cooled).

(3) The number and arrangement of cylinders.

(4) The number, location, volume, and composition of catalytic converters.

(5) Method of air aspiration.

(6) Bore and stroke.

(7) Configuration of the combustion chamber.

(8) Location of intake and exhaust valves or ports.

(c) In some cases you may subdivide a group of engines that is identical under paragraph (b) of this section into different engine families. To do so, you must show you expect emission characteristics to be different during the useful life or that any of the following engine characteristics are different:

(1) Method of actuating intake and exhaust timing (poppet valve, reed valve, rotary valve, etc.).

(2) Sizes of intake and exhaust valves or ports.

(3) Type of fuel.

(4) Configuration of the fuel system.

(5) Exhaust system.

(d) If your engines are not identical with respect to the things listed in paragraph (b) of this section, but you show that their emission characteristics during the useful life will be similar, we may approve grouping them in the same engine family.

(e) If you cannot define engine families by the method in this section, we will define them based on features related to emission characteristics.

§ 1048.235 How does testing fit with my application for a certificate of conformity?

This section describes how to test engines in your effort to apply for a certificate of conformity.

(a) Test your engines using the procedures and equipment specified in subpart F of this part.

(b) Select from each engine family a test engine for each fuel type with a configuration you believe is most likely to exceed the emission standards. Using good engineering judgment, consider the emission levels of all exhaust constituents over the full useful life of the engine when operated in a piece of equipment.

(c) You may submit emission data for equivalent engine families from previous years instead of doing new tests, but only if the data shows that the test engine would meet all the requirements for the latest engine models. We may require you to do new emission testing if we believe the latest engine models could be substantially different from the previously tested engine.

(d) We may choose to measure emissions from any of your test engines.

(1) If we do this, you must provide the test engine at the location we select. We may decide to do the testing at your plant or any other facility. If we choose to do the testing at your plant, you must schedule it as soon as possible and make available the instruments and equipment we need.

(2) If we measure emissions on one of your test engines, the results of that testing become the official data for the engine. Unless we later invalidate this data, we may decide not to consider your data in determining if your engine family meets the emission standards.

(3) Before we test one of your engines, we may set its adjustable parameters to any point within the physically adjustable ranges (see § 1048.115(d)).

(4) Calibrate the test engine within the production tolerances shown on the engine label for anything we do not consider an adjustable parameter (see § 1048.205(m)).

§ 1048.240 How do I determine if my engine family complies with emission standards?

(a) Your engine family complies with the numerical emission standards in § 1048.101 if all emission-data engines representing that family have test results